Maps API for JavaScript

Developer's Guide

Public Version 2.5.4

www.EngineeringBooksPdf.com

Contents

Legal Notices 4
Document Information 5

Chapter 1: Overview 6
What Is the Maps API for JavaScript? 7
Feature List 7
Packages and Detection 8
Browser Support 9
HTML5 Support 10
Performance 10

Chapter 2: Quick Start 12
Basic Scenario 13
Loading the API Code Library 13
Implementing the Application 14
Setting Credentials 15
Displaying a Map 15

Chapter 3: User Guide 17
Acquiring Credentials 18
Beyond the Basic Map Application 18
Map Types 20
Components and User Interaction 23
Markers 25
Geo Objects 28
Map Overlays 29
A Map of Berlin from 1789 30
Routing 33

www.EngineeringBooksPdf.com

Traffic....35
KML Support....36
Heat Maps....37
Marker Clustering....39
Places....41
Architecture in Outline....42
Places Widget....44
Searching for Places....47
Displaying Place Details....51
Making Sure the Widget Is Ready....55
Templates....56
Positioning....89
Event System....91
Observers and Mutable Objects....95
Multi-language Support....96

Chapter 4: API reference....98

jsMotif....99
Template....99
selector....103
nokia....105
Features....105
Settings....110
maps....114
places....681

www.EngineeringBooksPdf.com

Legal Notices

© 2014 HERE. All rights reserved.

This material, including documentation and any related computer programs, is protected by copyright controlled by HERE. All rights are reserved. Copying, including reproducing, storing, adapting or translating, any or all of this material requires the prior written consent of HERE. This material also contains confidential information, which may not be disclosed to others without the prior written consent of HERE.

Trademark Acknowledgements

HERE and Nokia are trademarks or registered trademarks of Nokia Corporation in the United States and other countries.

Other trade names are trademarks or registered trademarks of their owners.

Disclaimer

This content is provided "as-is" and without warranties of any kind, either express or implied, including, but not limited to, the implied warranties of merchantability, fitness for a particular purpose, satisfactory quality and non-infringement. Nokia does not warrant that the content is error free and Nokia does not warrant or make any representations regarding the quality, correctness, accuracy, or reliability of the content. You should therefore verify any information contained in the content before acting on it.

To the furthest extent permitted by law, under no circumstances, including without limitation Nokia's negligence, shall Nokia be liable for any damages, including, without limitation, direct, special, indirect, punitive, consequential, exemplary and/ or incidental damages that result from the use or application of this content, even if Nokia or an authorized representative has been advised of the possibility of such damages.

www.EngineeringBooksPdf.com

Document Information

Product	
Name:	Maps API for JavaScript
Version:	Public Version 2.5.4

Document	
Name:	Maps API for JavaScript Developer's Guide
Id:	9d33fc4-1394728860
Status:	FINAL
Date:	2014-Mar-13, 16:43 (GMT)

www.EngineeringBooksPdf.com

Chapter 1

Overview

Topics:

- *What Is the Maps API for JavaScript?*
- *Feature List*
- *Packages and Detection*
- *Browser Support*
- *HTML5 Support*
- *Performance*

This article defines the HERE Maps API for JavaScript, explains its purpose, summarizes its features and outlines how it supports third-party application development.

www.EngineeringBooksPdf.com

What Is the Maps API for JavaScript?

The HERE Maps API for JavaScript (the *Maps API*) is a set of programming interfaces that enable developers to build Web applications with feature rich, interactive *HERE Maps* at their center. The API consists of libraries of classes and methods with which to implement the functionality of an interactive application.

The associated *API Explorer* offers ready-made working examples, whose code the developer can modify and view the effect immediately.

Feature List

The main features offered by the Maps API are summarized in the table below:

Table 1: Main features of the HERE Maps API for JavaScript

Feature	Description
HERE Maps map data	The API provides full access to world-leading map data in three different modes: *satellite*, *terrain* and *hybrid*.
Points of interest	The map data to which the API offers access, include millions of different places, landmarks, places and addresses located on maps. Their visibility on the map can be controlled via the API.
Searches	The API allows you to build search functionality into you application. Users can searches for places, using keywords, addresses, or geographic coordinates.
Geocoding	The API provides full access to geocoding and reverse geocoding services.
Routing	The API allows you to define and render routes between a start and a destination point. It supports many navigation options such as toll road preference and transport type.
W3C positioning	The API includes built-in functionality that takes advantage of the W3C *Geolocation API* supported by many browsers.
Custom items	The API allows you to modify existing markers or create custom ones, using SVG or bitmap images. You can also add geo shapes based on coordinates to the map: polygons, polylines, circles or rectangles, and make these custom map object interactive by assigning UI events to them.

www.EngineeringBooksPdf.com

Packages and Detection

The HERE Maps API for JavaScript is modular and contains separate packages for maps, places, positioning, directions (routing) and data rendering. If an application does not require certain packages, you can reduce the footprint and load time by excluding them.

The entry point to the API is the JavaScript file "jsl.js" (see also *Quick Start* on page 12). It contains a package loader and an environment detection mechanism. To load the API, set the "src" attribute of a `<script>` element to the base URL followed by the name of this file. You can alter the packages loaded by the `<script>` element by appending the parameter `with`, followed by the equals sign (=), followed by a comma-spearated list of packages. If you do not specify any packages (that is if you use the URL only without the `with` parameter), the Maps library package is loaded by default.

The table below shows the packages you can select, using the query parameter `with` and the default loading behavior.

Table 2: Selectable packages in the HEREMaps API for JavaScript

URL Parameter	Allowed Values [1]	Default
`with`	`maps`, `positioning`, `places` [2], `placesdata` [2], `directions`, `datarendering`, `all` [3]	`maps` [4]

The following notes relate to this table:

[1] values can be combined in a comma-separated sequence, but specify either `places` or `placesdata` (not both); `all` must not be used if any other package is specified

[2] `places` means that the complete Places library is loaded (both UI and data); to load the data-only Places library, use `placesdata`

[3] `all` loads all the available libraries

[4] equivalent to "with=maps,placesdata", which loads the Maps library package and the Places data-only library package, not the Places UI library

The example below shows an HTML page that loads the following library packages: Maps, Places (complete), Rouging and Positioning.

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
```

www.EngineeringBooksPdf.com

```
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
    <head>
        <meta http-equiv="Content-Type" content="text/html;
        charset=UTF-8" />
        <meta http-equiv="X-UA-Compatible" content="IE=7;
        IE=EmulateIE9; IE=10" />
        <script type="text/javascript"
            src="http://js.api.here.com/se/2.5.4/jsl.js?
            with=maps,places,directions,positioning">
        </script>
    </head>
    <body>
        ...
    </body>
</html>
```

Please note that the last part of the URL before the name of the JavaScript file is the release version number for the Maps API, which means that the URL changes, depending on which version you wish to use.

Browser Support

The Maps API is a multi-purpose and cross-platform API, targeting all JavaScript-enabled Web browsers, whether desktop or mobile, as well as all HTML5 environments (see the next section for information about HTML5 support).

Because the number of possible browser and platform combinations is too large, we limit our support to the following list of browsers:

Table 3: Browser support in HERE Maps API for JavaScript

Browser	Support
Internet Explorer 7+	desktop, Windows Phone with Mango update or later on mobile*
Firefox 3.6+	desktop
Google Chrome 12+	desktop, Android 2.2+ on mobile/tablet*
Apple Safari 5+	desktop, iOS 4+ on mobile/tablet

** support does not extend to all multi-touch gestures*

www.EngineeringBooksPdf.com

HTML5 Support

Although HTML5 is a new emerging HTML standard, and as such it is still undergoing continual improvement, the HERE Maps API for JavaScript is committed to supporting it.

For information regarding the latest features of HTML5 please visit the official *HTML5 Specification page of the W3C*. Details on HTML5 compliance in different Web browsers, are available on *THE HTML5 TEST*.

The built-in support for HTML5 in the Maps API enhances the user experience in browsers that implement the following aspects of the HTML5 specification:

SVG The HTML5 specification allows for embedding of Scalable Vector Graphics (SVG) in HTML pages. The use of SVG increases the rendering speed of custom shapes and forms. The Maps API supports the use of SVG icons as custom markers.

Geolocation Browsers that offer HTML5 geolocation support are able to share their position on the globe and this means that the Maps API can request the location details from the browser. On most mobile devices, geolocation detects a user's position to within a few meters. It is also possible to obtain an accurate current position on desktop environments connected to the Internet via Wi-Fi, but note that there may be some delay in response, as the Wi-Fi positioning look-up is based on a server request. Positioning look-up and response time vary from browser to browser. The security policy on most browsers does not automatically allow immediate access and a confirmation dialog is shown instead. Please bear this in mind when using the geolocation feature.

Performance

The HERE Maps API for JavaScript has been designed to meet the demands of modern Web application development. The common development patterns it implements help improve efficiency and shorten the development cycle.

www.EngineeringBooksPdf.com

Fast start-up	The Maps API for JavaScript is outstanding in terms of memory consumption due to the small size of the underlying JavaScript framework. The map starts fast and the content loads smoothly.
Fast loading	The Maps API for JavaScript provides packaged and lazy loading of features such as route and search – and even of the map data itself. The content is downloaded from the server only when needed.
Fast browsing	The Maps API for JavaScript supports in-built browser caching. Once the content has been downloaded from the server, it is reused as much as possible to minimize bandwidth usage.

www.EngineeringBooksPdf.com

Chapter 2

Quick Start

Topics:

- *Basic Scenario*
- *Loading the API Code Library*
- *Implementing the Application*

This article describes the simplest scenario using the Maps API for JavaScript and illustrates it with a working example.

Note that the example uses demo credentials. These are suitable for testing, but must be replaced with application-specific credentials in your own applications.(please see also *Acquiring Credentials* on page 18)

www.EngineeringBooksPdf.com

Basic Scenario

The most basic scenario is to create an application that displays a non-interactive map. To do that:

1. Load the Maps API for JavaScript library from the HTML page – the "src" attribute of a `<script>` element within the <head> must point to the Maps package.
2. Set authentication and authorization credentials – this is needed for unlimited access to the HERE Maps API for JavaScript.
3. Implement the application – write the code that implements the behavior of the application inside a `<script>` element in the <body> of the page; it takes only a few lines of JavaScript to create a fully functioning application with an interactive map.

Loading the API Code Library

To load the Maps library of the HERE Maps API for JavaScript, add the following `<script>` element to the <head> of the HTML document:

```
<script src="http://js.api.here.com/se/2.5.4/jsl.js" type="text/
javascript" charset="utf-8"></script>
```

The URL in the `"src"` attribute contains the version number, which is specific to the API release. In other words, that part of the URL changes with each release of the Maps API.

If you use Microsoft Internet Explorer, you can ensure compatibility by placing this line with a meta tag before any `<script>` elements in the <head>:

```
<meta http-equiv="X-UA-Compatible" content="IE=7; IE=EmulateIE9; IE=10"/>
```

And here is the complete <head> element that loads the default `maps` library package of HERE Maps API for JavaScript and makes sure there is no conflict with IE:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
    <head>
    ...
     <meta http-equiv="X-UA-Compatible" content="IE=7;
         IE=EmulateIE9; IE=10" />
     <script src="http://js.api.here.com/se/2.5.4/jsl.js"
     type="text/javascript" charset="utf-8">
     </script>
    ...
```

www.EngineeringBooksPdf.com

```
    </head>
```

The file `jsl.js` contains:

- common classes that are always needed, regardless of the module combination
- a package loader which enables the loading of specific module combinations
- environment detection code that enables the API to determine an optimal set of packages for the environment

For more information about loading the library and the available options, please see *Packages and Detection* on page 8.

Note that if you wish the map to fill the entire window in Internet Explorer 7 or 8, you must set the CSS attributes that control the position and dimensions of the body element as shown in the example below, otherwise map will flicker during panning.

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
    ...
    <meta http-equiv="X-UA-Compatible" content="IE=7; IE=EmulateIE9; IE=10" />
    <style type="text/css">
        html {
            overflow:hidden;
        }

        body {
            margin: 0;
            padding: 0;
            position: absolute;
            overflow:hidden;
            width: 100%;
            height: 100%;
        }

        #mapContainer {
            width: 100%;
            height: 100%;
            left: 0;
            top: 0;
            position: absolute;
        }
    </style>
...
</head>
<body>
    <div id="mapContainer"></div>
    ...
</body>
```

Implementing the Application

At this point, two steps from the *Basic Scenario* on page 13 remain to be completed to ensure that the application is complete and functional: we need to provide access credentials and the code

www.EngineeringBooksPdf.com

that defines what the application does. To do this, we need to place a <script> element within the <body> of the HTML page and write the implementation code there.

Setting Credentials

An essential part of creating a working application with the HERE Maps API for JavaScript is to provide the application credentials. To do that, use the method nokia.Settings() – note that you need to use the actual app_id and app_code you have received on registration (please see *Acquiring Credentials* on page 18):

```
nokia.Settings.set("app_id", "YOUR_APPID");
nokia.Settings.set("app_code", "YOUR_TOKEN");
```

Displaying a Map

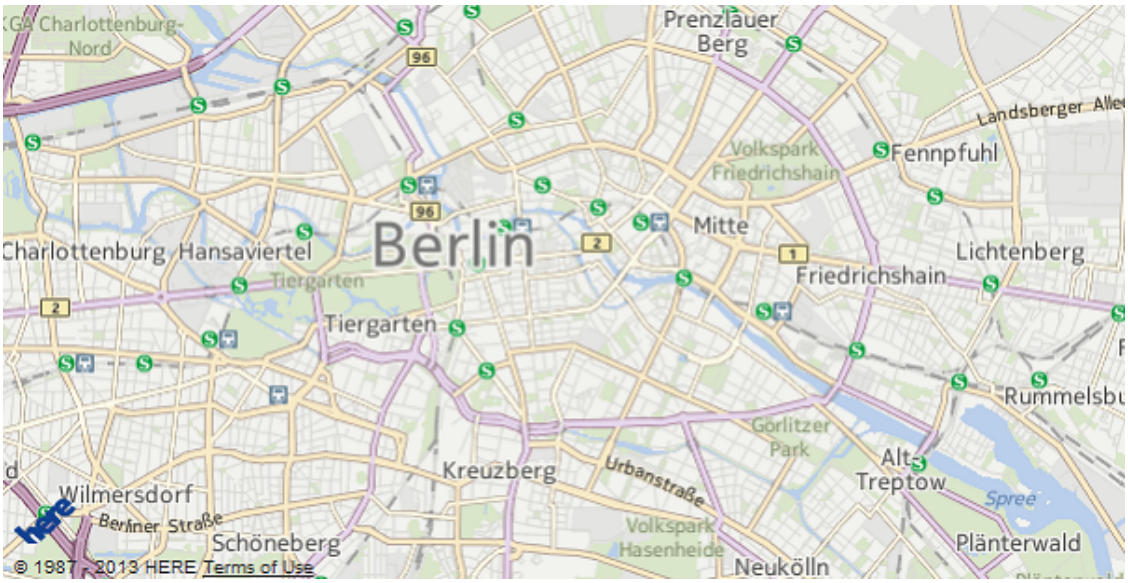
The simplest application using the HERE Maps API for JavaScript is one that displays a non-interactive map centered on a predefined location at a fixed zoom level. To implement it:

1. Define a target HTML element in which the map is to be rendered, setting the "id" attribute on it.
2. Instantiate nokia.maps.map.Display, passing to the constructor the id of the target element, the desired map zoom level and the coordinates of the location on which you want to center of the map

www.EngineeringBooksPdf.com

Below, you can see the outcome of implementing this simple scenario as a map image and also (further down the page) the code showing how it has been achieved.

Figure 1: A basic non-interactive map




```
var map = new nokia.maps.map.Display(
    document.getElementById("mapContainer"), {
        // Zoom level for the map
        zoomLevel: 10,
        // Map center coordinates
        center: [52.51, 13.4]
    }
);
```

This code places the map inside a with the "id" set to "mapContainer". Other DOM elements that support nesting can be used as well, for example , <p>, or , but we strongly recommend as the host element for the map for best results.

Bear in mind that most browsers use predefined styles for many DOM elements. To ensure a consistent look and feel in different browsers, you need to apply your own CSS style to the DOM element that displays the map. The code examples shown in this guide demonstrate how to do this in a simple, but effective browser-independent way.

www.EngineeringBooksPdf.com

Chapter 3

User Guide

Topics:

- *Acquiring Credentials*
- *Beyond the Basic Map Application*
- *Map Types*
- *Components and User Interaction*
- *Markers*
- *Geo Objects*
- *Map Overlays*
- *Routing*
- *Traffic*
- *KML Support*
- *Heat Maps*
- *Marker Clustering*
- *Places*
- *Positioning*
- *Event System*
- *Observers and Mutable Objects*
- *Multi-language Support*

This part of the guide explains essential concepts and shows how to use the Maps API for JavaScript. It is a companion to the API Reference.

The text includes examples that show the API in operation. Note that where credentials are required, the examples use demo ones. These are acceptable for testing purposes, but must be replaced by application-specific credentials in real-life applications (please see also *Acquiring Credentials* on page 18).

The HERE Maps API for JavaScript has been designed to help developers meet the challenges of modern Web application development. The articles that follow describe various aspects of the API, including a number of state-of-the-art development patterns it supports.

www.EngineeringBooksPdf.com

Acquiring Credentials

All users of HERE APIs must obtain authentication and authorization credentials and provide them as values for the parameters `app_id` and `app_code`. The credentials are assigned per application.

To obtain the credentials for an application, please visit *http://developer.here.com/get-started* for more details.

Beyond the Basic Map Application

Quick Start on page 12 describes an elementary scenario confined to displaying a non-interactive map is shown on the screen. Real-life applications are likely to go further, using the Maps API to deliver interactive functionality, animations, etc. For example, an application may start by showing a street/physical map and allow the user to select a different map type such as satellite. The application may also zoom in on a particular location on the map in response to the user double-clicking on the map.

In the first of these examples, the application user is able to effect a change to the "base map type", while switching to a different map zoom level involves animation. As a developer, you need to consider that to display the map when the application starts and then subsequent changes to the map type or map view and any animations are asynchronous. If another operation occurs before an asynchronous changes has completed, the results may be unpredictable, with your application becoming unstable. To prevent this, your code must be listen for certain events and act on them:

- **`displayready`** – fired when the map is initially ready; no code related to map view manipulation, such as calls to `setZoomLevel()` , `setCenter()`, `setBaseMapType()`, etc. must be allowed to run (although you can add components or markers to the map and perform other operations that do not affect the map view).
- **`basemapchangestart`** , **`basemapchangeend`** – fired to mark the start and end of a change to the base map type; no code that must be allowed to modify the map view until `basemapchangeend` has been received, otherwise the map may display an unexpected location or it may become unstable.
- **`transitionstart`** , **`transitionend`** – fired to mark the beginning and end of a map animation (transition) and also between the events `basemapchangestart` and `basemapchangeend`, because base map changes include animation effects (if transition parameter is set to 'default'); no code that must be allowed to modify the map view until `transitionend` has been received, otherwise the map may display an unexpected location or it may become unstable.

www.EngineeringBooksPdf.com

The following sections show examples of program code detecting `displayready` and `transitionend`. Examples involving `basemapchangeend` are included in the article *Map Types* on page 20.

For information about support for other types of events in the Maps API, please see *Event System* on page 91.

Waiting for Display to Be Ready

The example below is very similar to the code you have seen in *Quick Start* on page 12, but it uses the method `addListener()` defined on the `Display` class to register a handler for the event `displayready`. The handler has an empty body, but in real life its code is the entry point to the implementation of the functionality of the application – functionality which requires the map to be shown as the first enabling step.

```
var map = new nokia.maps.map.Display(
    document.getElementById("mapContainer"), {
        // Zoom level for the map
        zoomLevel: 10,
        // Map center coordinates
        center: [52.51, 13.4]
    });

    map.addListener("displayready" function () {
        // Place code implementing the functionality of app
        // here, for example to manipulate the map view.
    });
```

Changing the Map View and Animation

As we have mentioned earlier, several methods defined on the Maps API class `Display` can be called to change the map view, for example `setZoomLevel()`, `setCenter()`, `setView()`. If the second argument is specified as `'default'` and the target map view is not too far from the current one, the map moves to the target view, using a transition (animation). The beginning of the transition is signaled by the event `transitionstart` and its end by `transitionend`. In the code that follows, the handler for `displayready`, changes the map zoom level from the initial 18 to 15 after a time-out of one second. It also defines a listener for the event `transitionend`. This listener is invoked when the map zoom level change has completed, merely to log that this is the case.

```
map = new nokia.map.Display(document.getElementById("mapContainer"), {
    center: [42.35086, -71.07149],
    zoomLevel: 18
});
map.addListener("displayready", function () {
    //animate zoom level change during the application run
    setTimeout(function () {

        function onTransitionFinished() {
            map.removeListener("transitionend", onTransitionFinished);
            console.log("transition finished");
        }
```

www.EngineeringBooksPdf.com

```
        map.addListener("transitionend", onTransitionFinished);

        map.setZoomLevel(15, 'default');
    }, 1000);
});
```

Map Types

The Map API allows you to choose a *map type* to display. For example, your application can use an ordinary road/street map, or a satellite map (based on satellite imaging), or a terrain map. The class `Display` defines constants that represent the available base map types:

Table 4: Map types supported by the HERE Maps API for JavaScript

Map type	Description
NORMAL	This is the default base type showing a conventional map
NORMAL_COMMUNITY	This is a type that shows a conventional map with community edits
SATELLITE	This is a type that offers a view of the map based on satellite imagery
SATELLITE_COMMUNITY	This is a type that offers a view of the map based on satellite imagery, with community edits
SMARTMAP	This is a type that offers a reduced-contrast map similar to the normal street map; its optimized color set makes it suitable for use with overlays
SMART_PT	This is a type that offers a reduced-contrast map, showing public transport lines
TERRAIN	This is a type that shows a map based on elevation profile imagery (a topographical map, with shading indicating the shape of the terrain)
TRAFFIC	This is a type that shows a map with traffic information

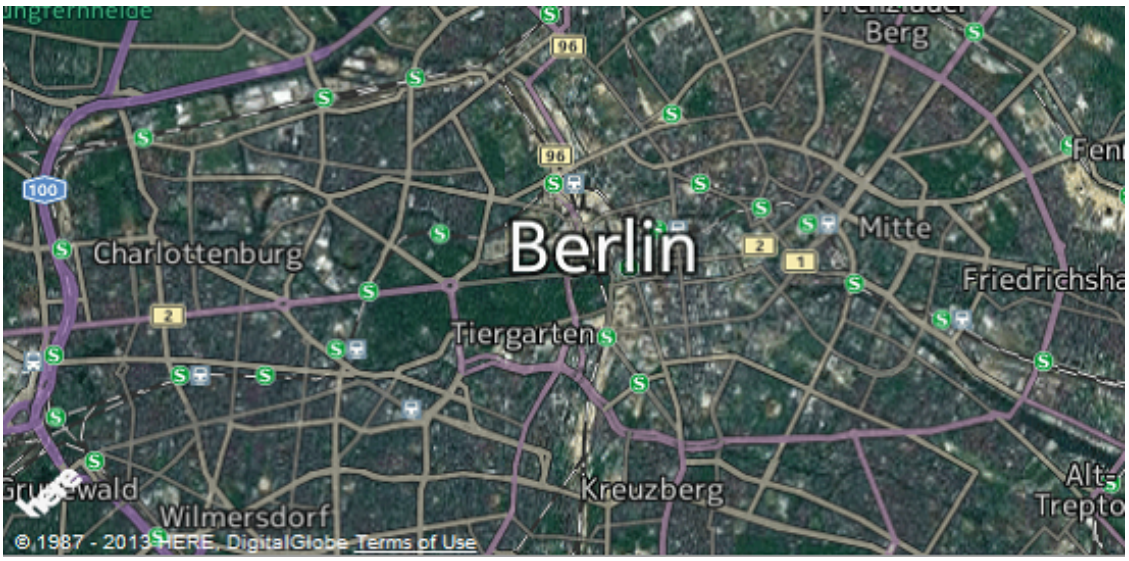
To set or change the base map type, use the method `setBaseMapType()` on an instance of the `Display` class:

```
// Activate satellite imagery on the display:
map.setBaseMapType(nokia.maps.map.Display.SATELLITE);
```

www.EngineeringBooksPdf.com

The image below shows a satellite view of the area covered by the basic map in the previous example. This is achieved simply by adding the above line of code to the script, setting the map type. You can see the complete JavaScript code below the image.

Figure 2: Map type "satellite"




```
var map = new nokia.maps.map.Display(
    document.getElementById("mapContainer"), {
        zoomLevel: 10,
        center: [52.51, 13.4],
        // Activate satellite imagery on the display:
        baseMapType: nokia.maps.map.Display.SATELLITE;
    }
);
```

Changing between Map Types and Setting a New Map View

A map type sets the overall appearance of the map, but not its orientation (heading), center or tilt, which are features of the *map view*. However, when you change the map type, it may be desirable to alter the map view as well. The Maps API allows you to do that and to ensure that the transition appears smooth to the map user's eye.

To trigger animation between map types, you need to provide a second parameter to the method `setBaseMapType()`. The required value is `'default'`. It ensures a smooth transition to the target map type.

The code below demonstrates how to implement a map type change to SATELLITE, with a smooth transition.

```
var map = new nokia.maps.map.Display(document.getElementById("mapContainer"),{
    zoomLevel: 16,
    center: [52.51, 13.4],
```

www.EngineeringBooksPdf.com

```
    baseMapType: nokia.maps.map.Display.NORMAL
});

map.addListener("displayready", function () {
    // Async transition to a new map type (after 3 seconds)
    setTimeout(function(){
        map.setBaseMapType(map.SATELLITE, 'default');
    },3000);
});
```

The alternative is to forgo animation and allow the map to change type immediately. This requires the second argument to `setBaseMapType()` to have the value `'none'`.

If you would like to specify a new map view when changing the map type, you need to provide a further argument to `setBaseMapType()`. This third argument is an object whose properties define the details of the target map view, including the geographic coordinates of the map center, zoom level, tilt and heading. The following example shows a call to `setBaseMapType()` that sets a new map type, ensures a smooth transition effect, and defines the details of the new the map view to which to transition:

```
map.setBaseMapType(map.SATELLITE, 'default', {
    latitude: 52.51,
    longitude: 13.4,
    zoom: 16
});
```

Map type changes are asynchronous. To avoid unpredictable results, it is important that no other interaction affects the map view while the rendering engine processes the map type change: in other words, there must be no attempt to alter the map center or zoom level or trigger (and process) any other asynchronous operations, when a map type switch is in progress. To ensure that is the case, listen for two events, the first fired when the transition has started (`basemapchangestart`) and the second when it has finished (`basemapchangeend`). They are fired by the map `Display` instance. Your handlers for these events need to eliminate unwanted map interaction, ensuring a smooth and consistent transition to the target view.

The code below shows the skeleton for the handler functions. Note that we do not attempt to process the events `transitionstart` and `transitionend`, because these are fired between `basemapchangestart` and `basemapchangeend`.

```
map.addListener("basemapchangestart", function () {
    // Map type change has started -- add
    // relevant handling here.
});

// Add listener so we know when map type change is complete:
map.addListener("basemapchangeend", function () {
    // Map type change has finished -- add
    // relevant processing here.
});
```

www.EngineeringBooksPdf.com

Components and User Interaction

The HERE Maps API for JavaScript ships with a basic set of User Interface (UI) components with which you can enhance an application built around an interactive map. The UI components allow the application user to zoom in or out, pan the map or change its scale, change the map type, etc.

The following UI components are available with the HERE Maps API for JavaScript:

Table 5: UI components in HERE Maps API for JavaScript

Component	Description
Behavior	A collection of components that enable general user interaction with the map via the mouse or touch (the interaction types include zoom, panning, etc.)
Zoombar	A component that provides a slider control on the map, allowing the user to zoom in/out – clicking on the plus sign increases the zoom level and causes the map to show more detail, while the clicking on the minus sign has the opposite effect.
Scalebar	A component that displays a scale bar at the bottom of the map. The user can expand it to see a ruler reflecting linear distance on the map. The user can change the units of measurement between metric and imperial.
TypeSelector	A component that displays a map type switcher in the top right corner of the map.
Overview	A component that allows the map user to see what lies beyond the current map view. The overview expands from the bottom right when the user clicks or taps on the Overview icon.
ZoomRectangle	A component that allows the map user to zoom the map to a specific rectangle (area) by dragging.
Positioning	A component that provides a button with which the map user can trigger a positioning request. On success, the map is centered on the obtained location. The size of a circle drawn around the location indicates the accuracy of the positioning data. The component is part of the positioning package.
ContextMenu	A component that shows a customized context menu on a right-click (or a longpress on touch devices).
InfoBubbles	A component that allows a developer to show information bubbles containing HTML content and to manipulate them.
PublicTransport	A component that provides a map overlay to display public transport lines. The map user can toggle the overlay, but note that the display of public transport information is confined to a range of zoom levels specific to the location/city.

www.EngineeringBooksPdf.com

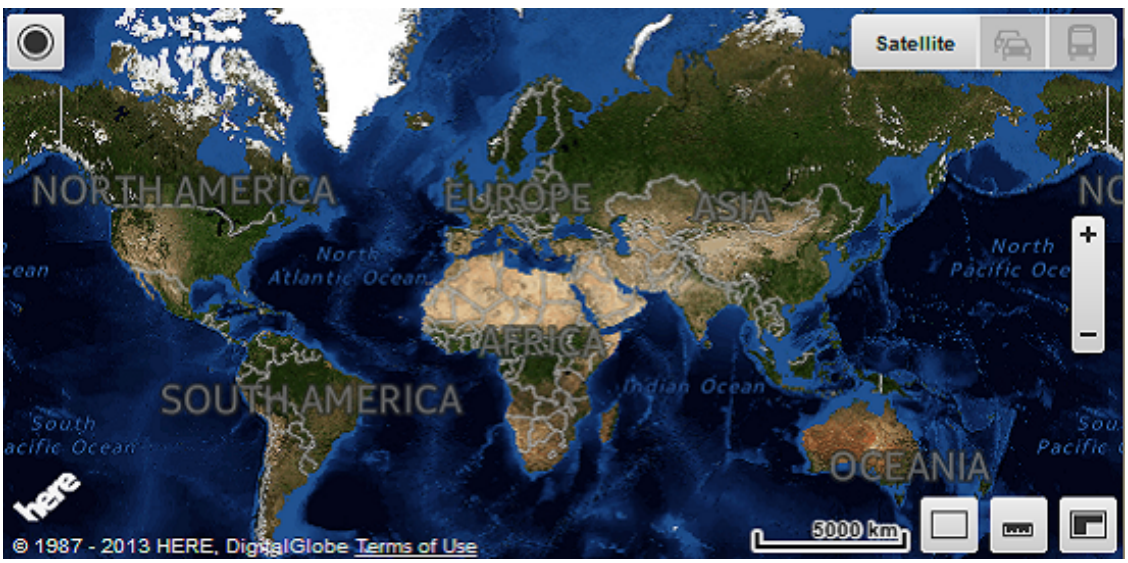
Component	Description
Traffic	A component that displays traffic information on the map as an overlay. The map user can toggle the overlay, but note that the display of traffic information is confined to a range of zoom levels specific to the location/city.

To add the UI components in an application, you need to add them to the `Display` instance:

```
var map = new nokia.maps.map.Display(
    document.getElementById("mapContainer"), {
        components: [
            // Behavior collection
            new nokia.maps.map.component.Behavior(),
            new nokia.maps.map.component.ZoomBar(),
            new nokia.maps.map.component.Overview(),
            new nokia.maps.map.component.TypeSelector(),
            new nokia.maps.map.component.ScaleBar() ],
        zoomLevel: 10,
        center: [52.51, 13.4]
    }
);
```

The following is a screen shot of an application similar to that in the previous example, but it includes UI components: in fact one of them has been used to change the map type to "SATELLITE" (via one of the buttons in the top right). The image also shows other components:

Figure 3: A map with UI components supported by the HERE Maps API for JavaScript



Note that the `Behavior` component added at `Display` instantiation in the code above includes a number of other components. If you find that you do not need all of them, you can remove them by adding a statement such as the following after you have created an instance of `Display`:

```
var map = new nokia.maps.map.Display(
    document.getElementById("mapContainer"), {
```

www.EngineeringBooksPdf.com

```
        components: [
            // Behavior collection
            new nokia.maps.map.component.Behavior(),
            new nokia.maps.map.component.ZoomBar(),
            new nokia.maps.map.component.Overview(),
            new nokia.maps.map.component.TypeSelector(),
            new nokia.maps.map.component.ScaleBar() ],
        zoomLevel: 10,
        center: [52.51, 13.4]
    }
);

map.removeComponent(map.getComponentById("zoom.MouseWheel"));
```

This piece of code above removes zooming with the mouse wheel. This makes sense when the map application is part of a long page and you want the user to be able to scroll the page by turning the wheel, without causing the map zoom to change at the same time.

As an alternative to adding a group of components and then removing some of them, consider creating an instance of `Display`, and then adding only those subcomponents of `Behavior` that you need. The following code sample demonstrates this:

```
var map = new nokia.maps.map.Display(
    document.getElementById("mapContainer"), {
        // Zoom level for the map
        'zoomLevel': 10,
        // Map center coordinates
        'center': [52.51, 13.4]
    }
);

map.addComponent( new nokia.maps.map.component.zoom.DoubleClick());
map.addComponent( new nokia.maps.map.component.panning.Drag());
map.addComponent( new nokia.maps.map.component.panning.Kinetic());
```

See also the code example in the article *Markers* on page 25, where only the `DoubleClick` zoom and the `DragMarker` behavior components are enabled during instantiation of the map `Display` class.

Markers

One of the most common use cases is to show points of interest (POIs) at and near a location. With the HERE Maps API for JavaScript you can use markers to do just that. The API offers two sorts of markers:

Table 6: Marker Types in HEREMaps API for JavaScript

Marker type	Description
StandardMarker	A marker that uses standard platform icons and a predefined set of properties whose values can be controlled via the API

www.EngineeringBooksPdf.com

Marker type	Description
Marker	A marker that allows you to use a custom icon image to indicate a point on the map

In a very simple scenario, you may wish to center the map at your location and put a marker there with a text label that says "Hi!" – just as in the picture below. The code that follows the image demonstrates the implementation.

Figure 4: A map containing a draggable marker, with a custom label

```
var map = new nokia.maps.map.Display(
    document.getElementById("mapContainer"), {
        components: [
            new nokia.maps.map.component.zoom.DoubleClick(),
            // Needed for marker drag
            new nokia.maps.map.component.objects.DragMarker()],
        zoomLevel: 15,
        center: [52.51, 13.4]
    }
);

// Create a marker and add it to the map
var marker = new nokia.maps.map.StandardMarker([52.51, 13.4], {
    text: "Hi!", // Small label
    draggable: true  // Make the marker draggable
});

map.objects.add(marker);
```

The code above creates a map and puts the marker at its center. The marker is an instance of the class `StandardMarker`, which supports custom labels via the property `'text'`. This marker is also draggable, which means you can move it around the map by clicking on it, holding the mouse button down and moving the mouse: the marker follows the mouse pointer and when you release the mouse button, it drops onto the map at a new location. This works on touch devices as well.

www.EngineeringBooksPdf.com

The `Marker` class in the Maps API is similar to `StandardMarker`, but instead of supporting custom colors and a text label, it allows you to use a custom marker icon. The image below shows just such a marker. The implementation code follows the picture.

Figure 5: A map containing a non-draggable marker

```
var map = new nokia.maps.map.Display(
    document.getElementById("mapContainer"), {
        components: [new nokia.maps.map.component.Behavior()],
        zoomLevel: 13,
        center: [52.51, 13.4]}
);

map.removeComponent(map.getComponentById("zoom.MouseWheel"));

var marker = new nokia.maps.map.Marker(
    new nokia.maps.geo.Coordinate(52.51, 13.4),{
        title: "marker",
        visibility: true,
        icon: "images/pic_marker_house.png",
        // Offset the top left icon corner so that it's
        // Centered above the coordinate
        anchor: new nokia.maps.util.Point(32, 32)
    }
);

map.objects.add(marker);
```

This code follows the same pattern as the previous examples, but creates an instance of `Marker` with a custom icon (its URL is given by the property `"icon"`). Because the icon is not a standard one, it is a good idea to specify which point in the icon image should "touch" the map at the point defined by the marker's geographical coordinates. This is done via the property `"anchor"`.

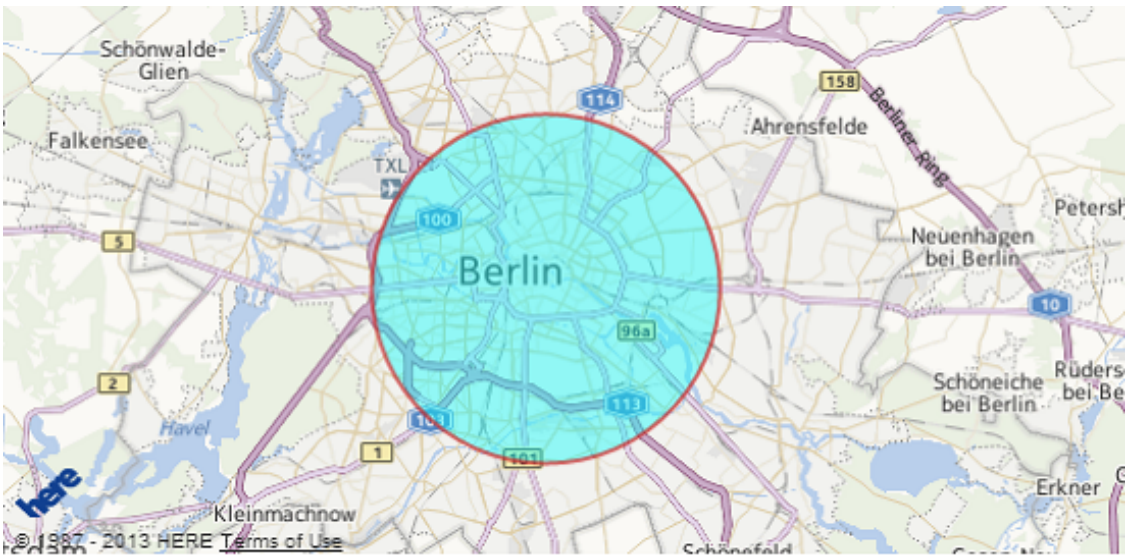
www.EngineeringBooksPdf.com

Geo Objects

The HEREMaps API for JavaScript provides easy means of highlighting and demarcating areas on the map with custom shapes. These include circles, rectangles, polylines and polygons. They allow you to draw on an on-line map as you can on a paper one with a pencil or pen, but with much greater flexibility, because you determine the colors, the line thickness and transparency for the graphical markings, plus you can position them with pinpoint accuracy.

The API classes that represent custom shapes need to be instantiated and added to the `Display` object . The example below demonstrates this by adding a circle to the map.

Figure 6: A map with a Circle shape




```
var map = new nokia.maps.map.Display(
    document.getElementById("mapContainer"), {
        components: [new nokia.maps.map.component.Behavior()],
        zoomLevel: 10,
        center: [52.51, 13.4]
    }
);

map.objects.add(new nokia.maps.map.Circle(
        // Place the circle center here
        [52.51, 13.4],
        // Radius of 8000 meters
        8000,
        {
            pen: {
                 strokeColor: "#C22A",
                 lineWidth: 2
            },
            brush: {
                 color: "#0FF6"
```

www.EngineeringBooksPdf.com

```
            }
        }
));
```

As you can see, a circle is an instance of the class named `Circle`. Its properties include the coordinates of the center, the radius, line color (defined by the property `"color"`), fill color and line width (given by the property `"width"`). All the properties of the circle can be set by passing an object (defined in JSON) to the class constructor.

Map Overlays

The Maps API allows you to display overlays on top of the map. In the simplest scenarios, the overlays are static tiles (images) that are requested by the client application from the map tile server and superimposed on the map in the client-side display. Such tiles may be images that present an alternative view of an area of the map or highlight certain features of the terrain, etc.

Other scenarios may require the use of dynamic overlays in order to improve efficiency by reducing the processing requirements on the client. For example, if an application needs to display 100,000 markers in a specific region, the designers can consider a custom map tile service to create map tiles "populated" on the fly with the required markers and deliver them to the client application on request. In another example, where a custom map tile service is likely to offer significant efficiency benefits, a transport company may wish to mark the several hundred routes it operates across the continent, using custom lines (thickness, color, etc.) Instead of requesting each route and adding it to the map, the client application can simply download the semi-transparent overlay tiles from the back-end map tile server.

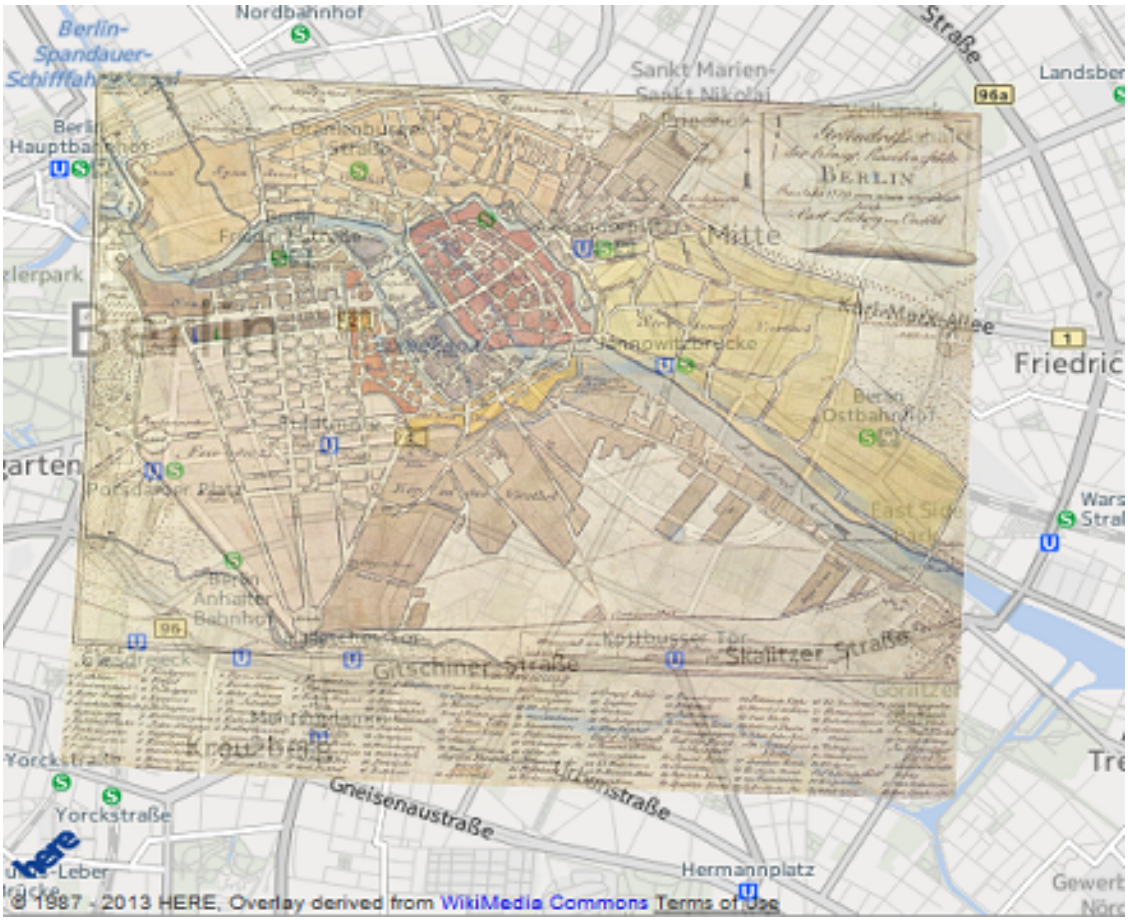
Naturally, a map tile service must be designed and implemented to specific requirements, therefore it is beyond the scope of both the Maps API and this documentation. However, we illustrate below a simple scenario in which an overlay showing a historical map of Berlin from 1789 is displayed on top of the standard modern map of the city delivered using the API.

www.EngineeringBooksPdf.com

A Map of Berlin from 1789

The 18th century map of Berlin in this example is based on a public domain image from *Wikimedia Commons*. We have divided the image into tiles, which the application below retrieves from our custom map tile server and displays over a contemporary street map of the city.

Figure 7: Berlin 1789 and today



The client-side implementation, consists of the following steps:

1. Define a DOM element in which the map is to be displayed.
2. Instantiate an object representing the viewable map (`nokia.maps.map.Display`).
3. Instantiate a tile provider object (`nokia.maps.map.provider.ImgTileProvider`).
4. Add the tile provider to the array of map overlays (`nokia.maps.map.Display.overlays`).

The section below expands on each of these points.

www.EngineeringBooksPdf.com

Base Map

The DOM element, where the map is to appear, is defined in the body of the HTML page as follows:

```
<div id="mapContainer"></div>
```

To access the API library, provide a `<script>` element that references it:

```
<script src="http://js.api.here.com/se/2.5.4/jsl.js" type="text/
javascript" charset="utf-8"></script>
```

Set the application id and code – please see *Acquiring Credentials* on page 18 for details.

To display the basic street map of Berlin, get a reference to the DOM element that is to display it and instantiate the map `Display`:

```
// Get the DOM node to which to append the map
var mapContainer = document.getElementById("mapContainer");

// Create a map inside the map container DOM node
var map = new nokia.maps.map.Display(mapContainer, {
    components: [
        new nokia.maps.map.component.ZoomBar(),
        new nokia.maps.map.component.Behavior(),
        new nokia.maps.map.component.TypeSelector()],
    zoomLevel: 14,
    center: [52.515, 13.405]
});
```

Tile Provider

To create a tile provider, it is necessary to instantiate the base class `nokia.maps.map.provider.ImgTileProvider`. In fact, this is the most complex part of the process. The constructor for `ImgTileProvider` requires an object described in the API Reference as `nokia.maps.map.provider.TileProvider.Options`. Only one element in `Options` is obligatory, a function that retrieves the overlay tiles (`getUrl`), but the code below specifies also non-mandatory properties, including the minimum and maximum zoom levels for the overlay, opacity (which makes the overlay semi-transparent) and a function that displays copyright and attribution information:

```
var tileProviderOptions = {
    getUrl: getTileURL, // obligatory
    max: 15,  // max zoom level for overlay
    min: 12,  // min zoom level for overlay
    opacity: 0.5, // 0 = transparent overlay, 1 = opaque
    alpha: true, // renderer to read alpha channel
    getCopyrights : showCopyright // display copyright
};
```

www.EngineeringBooksPdf.com

It is necessary to provide a value for the property `getUrl`, otherwise the Maps API library generates an error message and terminates execution of the code. In our case, the value is the function `getTileURL()`, which retrieves the tiles from the map tile server. The following principles apply:

1. At the minimum zoom level, the world is contained in a single 256x256 pixel tile.
2. At the next higher zoom level, the world is two tiles wide and two tiles high.
3. Every higher zoom level splits the tiles in two, doubling the number of tiles across the width and height. This produces the tile grids of 4x4, 8x8, 16x16, etc.
4. Typically, each map is based on the Normalized Mercator projection.

Central Berlin is displayed in tile 1343,2200 at Zoom 12. The range of available tiles doubles at each zoom level thereafter.

Here is the implementation of `getTileURL()`:

```
function getTileURL (zoom, row, column) {
    // If Berlin is not displayed, return a blank
    //  tile.
    if (((zoom == 12) &&  ( row != 1343  || column != 2200))||
        ((zoom ==13) && (row < 2686 || column < 4400 ||
        row > 2687 || column > 4401 ))||
        ((zoom == 14) &&  ( row <  5372 ||
        column < 8800 || row > 5375 || column > 8803))||
        ((zoom  == 15)  && ( row  < 10744 ||
        column < 17601 || row > 10750 || column > 17607))){
            return "."+  "/oldberlin/blank.png";
        }

    // The Old Berlin Map Tiler follows the TMS URL
    // specification. According to the specification,
    // map tiles should be accessible in the following
    // format:
    //
    // http://server_address/zoom_level/x/y.png
    //
    // In our case, the URL is something like
    // "oldberlin/13/1343/2200.png"
    return "." + "/oldberlin/"+ zoom+ "/"+ row + "/" +
        column + ".png";
};
```

Unless you own the map tile source, you need to comply with the licensing agreement of the map tile provider. Often, this means giving an attribution text or acknowledgement of the copyright of the original owner, even if the image tiles are offered free of charge. The function `showCopyright()` function helps display this acknowledgement in the bottom left corner of the map.

```
function showCopyright (area, zoom) {
    // If the zoom is too low or too high, do not display any
    // copyright information:
    if (zoom < 12 || zoom > 15) {
        return [];
    }

    // Otherwise, add the attribution to the map:
    return [{
        label: "Overlay derived from <a href=
```

www.EngineeringBooksPdf.com

```
            'http://commons.wikimedia.org/wiki/File:Map_de_berlin_1789_%28georeferenced
%29.jpg'>
            WikiMedia Commons</a>",
        alt: "Overlay Based on a WikiMedia Commons Image in the Public Domain"
    }];
}
```

Displaying the Overlay

With the code above in place, we can now create an instance of the tile provider:

```
var oldBerlinOverlay =
    new nokia.maps.map.provider.ImgTileProvider (
        tileProviderOptions);
```

Finally, we can add the overlay to the map (and so display it):

```
map.overlays.add(oldBerlinOverlay);
```

Routing

Route planning and navigation are the most commonly used applications of location-based services. With the Maps API, you can calculate optimal routes that match your own calculation criteria, are based on up-to-date map data, and take into account real-time traffic information.

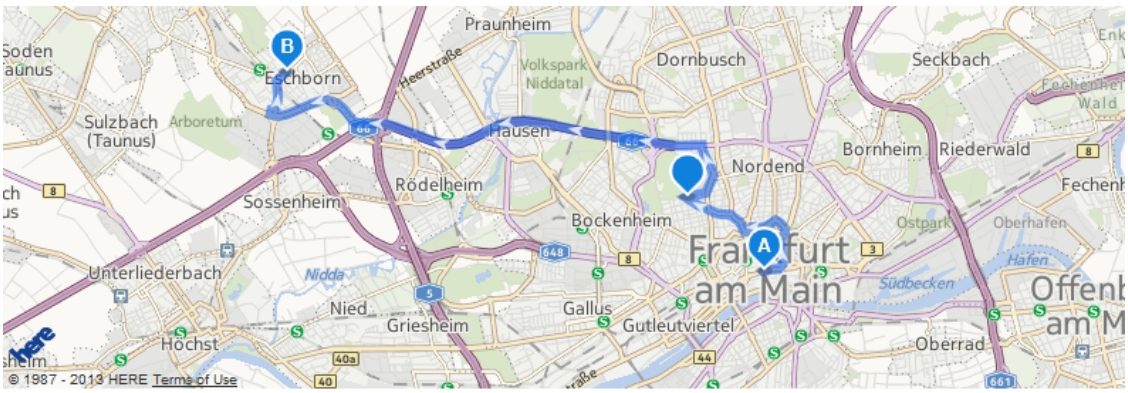
The API offers global coverage of streets and highways, allowing you to create routes reflecting customizable modes such as fastest, shortest, avoiding toll roads or ferries, etc. There is also support for utilizing historical speed patterns as an optimization for routes depending on the time of day.

here

www.EngineeringBooksPdf.com

The image below shows a route between Frankfurt am Main in Germany (marker A) and the town of Eschborn (marker B). It is followed by the implementation code.

Figure 8: A map showing a driving route from Frankfurt am Main to Eschborn



After instantiating the map `Display` and routing `Manager`, it defines a simple list of two waypoints (the start and finish of the route), the navigation modes – an object specifying that the route is for a journey by car and that it is to avoid toll roads. Next, the implementation sets up a callback function to retrieve the route once it has been calculated, add it to map and set the map zoom level so that the entire route is visible. It then adds the callback as an observer to the route `Manager` instance and makes the `Manager` calculate the route.

```
var map = new nokia.maps.map.Display(
    document.getElementById("mapContainer"), {
        components: [new nokia.maps.map.component.Behavior()],
        zoomLevel: 11,
        center: [50.12, 8.62]
});

// Create a route manager
var router = new nokia.maps.routing.Manager();

// Create waypoints
var waypoints = new nokia.maps.routing.WaypointParameterList();

waypoints.addCoordinate(
    new nokia.maps.geo.Coordinate(50.1120423728813, 8.68340740740811)
);

waypoints.addCoordinate(
    new nokia.maps.geo.Coordinate(50.140411376953125, 8.572110176086426)
);
var modes = [{
    type: "shortest",
    transportModes: ["car"],
    options: "avoidTollroad",
    trafficMode: "default"
}];

var onRouteCalculated = function (observedRouter, key, value) {
    if (value == "finished") {
        var routes = observedRouter.getRoutes();

        // Create the default map representation of a route
```

www.EngineeringBooksPdf.com

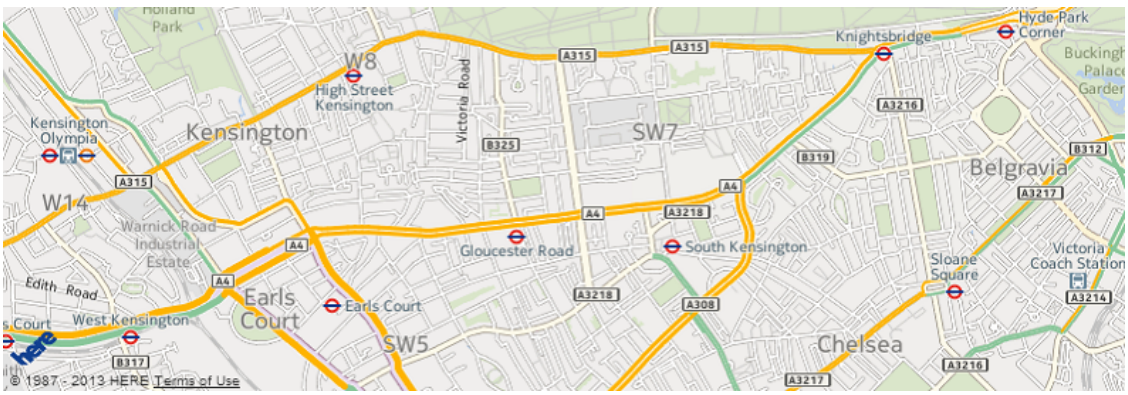
```
        var mapRoute = new nokia.maps.routing.component.RouteResultSet(routes[0]).container;
        map.objects.add(mapRoute);

        // Zoom to the bounding box of the route
        map.zoomTo(mapRoute.getBoundingBox(), false, "default");
    } else if (value == "failed") {
        alert("The routing request failed.");
    }
};

// Add the observer function to the router's "state" property
router.addObserver("state", onRouteCalculated);

// Calculate the route (and call onRouteCalculated afterwards)
router.calculateRoute(waypoints, modes);
```

Traffic

The Maps API allows you to display traffic data on the map for major urban areas around the globe. In fact, the Traffic UI component of the Maps library, provides a button that allows the user to toggle the display of traffic-related data.

The example described below uses the traffic component of the Maps library to show a map of central and west London, indicating the traffic conditions: roads where traffic flows freely are marked in green, roads where congestion is moderate are in orange, while those that are congested are marked red.

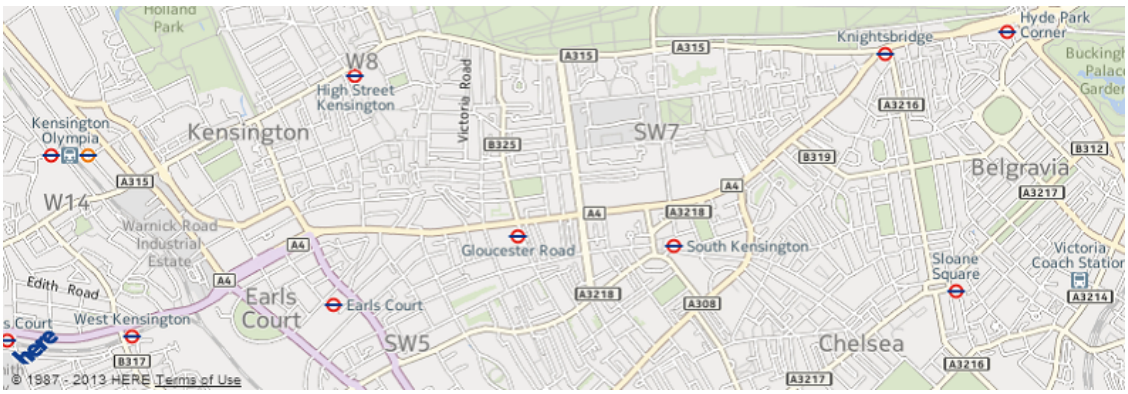
Figure 9: A map reflecting road congestion in central London



www.EngineeringBooksPdf.com

And here is the same area of London after the user has clicked on the Traffic toggle button – the map is an ordinary street map of this area of the city.

Figure 10: A map with traffic display turned off



The implementation is very simple. The `Display` constructor's initialization object includes the properties that set the map center and zoom level and, in addition, a property named `components` to ensure that the Traffic UI component is initialized. The last line of code ensures that the initial map type is set to "traffic".

```
// Get the DOM node to which we will append the map
var mapContainer = document.getElementById("mapContainer");

// Create a map inside the map container DOM node
var map = new nokia.maps.map.Display(mapContainer, {
    // initial center and zoom level of the map
    center: [51.49, -0.12],
    zoomLevel: 13,
    components: [
        // Create a button to togglee traffic information on the map
        new nokia.maps.map.component.Traffic()
    ]
});

map.set("baseMapType", nokia.maps.map.Display.TRAFFIC);
```

KML Support

Because creating content on top of a map is time consuming, most developers look to standards to help them transfer content between platforms seamlessly, and typically use KML, which captures data in XML. For further information, please visit the *KML page of the Open Geospatial Consortium*.

The KML specification supports a variety of objects, such as place marks, images and polygons. Many of them have their counterparts in the HERE Maps API for JavaScript landscape. To translate KML objects to HERE Maps API objects, use the component `KMLResultSet`, which is part of the `kml`

www.EngineeringBooksPdf.com

package. It uses a dedicated `Manager` class to handle asynchronous loading of KML data either from a text source or from a KML file.

The HERE Maps API supports the import of KML files and data sets compliant with versions 2.1 and 2.2 of the KML standard. There are only a small number of features that the API does not as yet support, for example, 3D buildings. The data are, however, interpreted in the best way possible and unsupported features are ignored in the KML data structure.

Figure 11: KML data rendered on a satellite map

For information on how to use the KML import in Web applications and how to interact with the KML objects, please look at the *KML file format* example in the *API Explorer*.

Please note that to satisfy the same-domain policy guidelines enforced by modern Web browsers, our example file and the application are hosted in the same domain, otherwise your browser would most likely raise a security exception.

Heat Maps

In certain circumstances, you may wish to show geographic information on the map in a way that reflects the frequency of occurrence of locations with specific characteristics or the relative values associated with locations. Markers, circles, polygons or polygons are useful when you simply want to show where places or areas are, but to indicate of relative values such as occurrence or intensity, it is better to use heat maps. To cater for such scenarios, the HERE Maps API for JavaScript supports two kinds of heat maps:

www.EngineeringBooksPdf.com

Table 7: Heat map types in HERE Maps API for JavaScript

Heat map type	Description
Value based	colors represent values associated with data points on the map
Density based	colors represent the density of data points on the map

The Maps API allows you to display heat maps as map overlays.

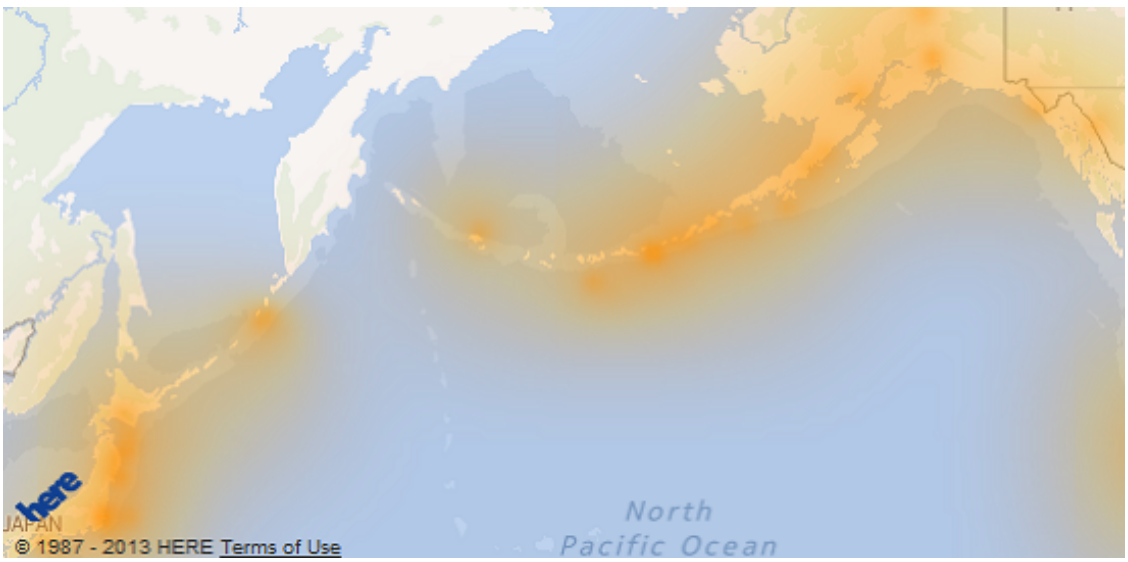
Data for the heat map are defined as a simple array of `DataPoint` objects:

```
var heatmapData = [
    {"value":6.1,"longitude":173.0219, "latitude":53.1380},
    {"value":5.8,"longitude":-171.8583, "latitude":52.0415},
    {"value":5.4,"longitude":-169.9851, "latitude":53.3657},
    {"value":4.6,"longitude":-169.5266, "latitude":51.2915},
    {"value":4.4,"longitude":-176.4482, "latitude":51.5722},
    {"value":4.3,"longitude":-171.5867, "latitude":51.8108},
    {"value":4.1,"longitude":-151.8272, "latitude":59.8977},
    {"value":3.6,"longitude":-171.7213, "latitude":51.6348},
    {"value":3.8,"longitude":-156.0880, "latitude":56.1681}
];
```

Note that the property `"value"` is optional in a density-based heat map.

The image below shows a map with a heat map overlay reflecting the density of earthquakes in Alaska based on the above data set. The image is followed by the implementation code.

Figure 12: Density based heat map



Note that heat map overlays cannot be displayed in Internet Explorer 7 or 8, because these browsers do not support the HTML5 Canvas.

www.EngineeringBooksPdf.com

The implementation of the heat map shown in the code below demonstrates how to add a heat map overlay to a map. The first step is to obtain an instance of the map `Display`. Next, the code defines an object that conforms to the interface `Colors`, setting the heat map gradients. After that, the code constructs a heat map overlay object, adds data to the overlay, and finally, adds the overlay to the map.

```
var map = new nokia.maps.map.Display(document.getElementById("mapContainer"), {
        zoomLevel: 3,
        center: [57.0415, -170.8583]
    }
);

// Definition of color gradient to be used in the Heatmap
var colorizeAPI = {
    stops: {
        "0": "#E8680C",
        "0.25": "#F5A400",
        "0.5": "#FF9000",
        "0.75": "#FF4600",
        "1": "#F51F00"
    },
    interpolate: true
};

var hmProvider = new nokia.maps.heatmap.Overlay({
    colors: colorizeAPI,
    opacity: 0.8,
    type: "density"
});

// Assuming that data have been loaded previously:
hmProvider.addData(heatmapData);
map.overlays.add(hmProvider);
```

Marker Clustering

When the map needs to show a very large number of marked locations, for example, to indicate stores that belong to a popular supermarket chain with thousands of branches in a particular region, it is easy to imagine that at certain zoom levels, the icons indicating the locations can appear so close together that they overlap and even hide a whole area of the map. If the locations were indicated, using individual markers, the map could become difficult to read, unless the map user zooms in to (or near) street level. To assist in managing such scenarios, the Maps API for JavaScript includes the `namespace nokia.maps.clustering`. It offers a means of displaying a dense cluster of markers as a single marker, which is replaced by individual markers as the map user zooms in.

The key classes in the namespace are `Cluster`, `Noise`, `ClusterProvider`, and `MarkerTheme`. As the name suggests, `Cluster` represents a cluster of markers and contains references to its members. `Noise` encapsulates individual markers that are not clustered. `ClusterProvider` is a cluster manager that uses an instance of `MarkerTheme` to display clusters and single markers (instances of `Noise`). You can view the detailed documentation of each of these classes in the API

www.EngineeringBooksPdf.com

Reference. It is worth noting, however, that `ClusterProvider` can work both with the default display theme (an instance of `MarkerTheme`) and with a custom theme that can use marker images of your choice.

The default display theme shows a cluster on the map as a circular marker with a number in its center to indicate the size of the cluster. The color, size and shadow of the cluster marker depend on the size of the cluster. It displays `Noise` points as small blue dots, with white stroke color. In a custom theme, the markers, their appearance and behavior depend on the implementation.

The remainder of this article describes a simple example of a clustering application that uses the default display theme. The application displays the location of 6978 airports on the map, their locations held in an array formatted as follows:

```
/**
 * Orginal source: http://openflights.org/data.html
 */
var data = [
    { latitude: -6.081689, longitude: 145.391881 },
    { latitude: -5.207083, longitude: 145.7887 },
    { latitude: -5.826789, longitude: 144.295861 },
    ...
];
```

To implement clustering based on this data, the example application:

1. Creates an instance of `nokia.maps.map.Display`
2. Creates an instance of `ClusterProvider` – its constructor requires a reference to the `map.Display` object as well as an object holding initialization properties for the default instance of `MarkerTheme`
3. Loads the script file containing the airport location data
4. Invokes the method `cluster()` on the `ClusterProvider` object

Below, you can see the complete contents of a <script> tag implementing the application. The code comments explain the details at each step:

```
// Get the DOM node in which to display the map. (This code
// assumes the presence of an HTML <div> element with
// the id "mapContainer".
var mapContainer = document.getElementById("mapContainer");

// Display a map inside the DOM node to which mapContainer
// refers:
var map = new nokia.maps.map.Display(mapContainer, {
    // initial center and zoom level of the map
    center: [52.51, 13.4],
    zoomLevel: 4,
    components: [
        // ZoomBar provides a UI to zoom the map
        // in/out
        new nokia.maps.map.component.ZoomBar(),
        // Add the component that allows user to
        // pan and zoom
        new nokia.maps.map.component.Behavior()
    ]
});
```

www.EngineeringBooksPdf.com

```
/*
 * Create an instance of ClusterProvider. It uses the default
 * display theme (an instance of
 * nokia.maps.clustering.MarkerTheme).
 * The code sets the epsilon distance (the radius within
 * which data points are considered for clustering, measured
 * in pixels), the smallest number of points within the
 * epsilon radius required to form a cluster, and an empty
 * array representing the data points (the actual data points
 * are loaded dynamically).
 */
var ClusterProvider = nokia.maps.clustering.ClusterProvider,
    clusterProvider = new ClusterProvider(map, {
        eps: 16,
        minPts: 1,
        dataPoints: []
    });

/* Load the data point definitions from the file airport.js
 * and provide a callback that adds the airport location
 * data to the instance of ClusterProvider and then creates
 * the markers and clusters.
 */
loadScript(
    "../resource/clustering/airports.js",
    function () {
        clusterProvider.addAll(data);
        clusterProvider.cluster();
    }
);
```

Places

The Places library allows you, as a developer, to enrich Web sites by providing a sophisticated search facility for users and a customizable means to display the results that include such information as place name, address, contact details, location map, rating, reviews, as well as related premium content.

The library includes:

- a *UI library* – a set of user interface widgets with methods that support place data search, retrieval and display
- a *Data library* – a set of programming interfaces that support searches for place data and data retrieval, but are not associated with a user interface

The resources available to developers using the Places library include style sheets (CSS) that can be easily attached to a Web page. As a developer, you are free to customize the existing templates or to use your own.

www.EngineeringBooksPdf.com

Places Library in Use

A real-life application that has been developed with the help of the Places library is the *WordPress HERE Maps & Places* plugin. It allows bloggers to add info on places, including contact details and maps, to WordPress posts or pages. To use the plugin is simplicity itself, no programming skills are required.

The articles in this section describe how to use the Places library to retrieve and process place-related data. Most of the discussion focuses on the use of *UI*-oriented part of the library (widgets and templates), but the last article departs from this theme to talk about the *Data*-only programming interfaces within the library.

The general scenario and a typical pattern of usage for the widget-based Places UI library is to:

- run an initial search – use the library's search functionality that accepts a street address or common terms such as "restaurant" or "museum"
- present the results to the user for selection – typically, the user is offered a navigable list
- retrieve the full details of the user's selection and display them – this includes showing to the user textual information such as the address, contact details, description, etc., but also rating and reviews, and also displaying the location of the place on the map

The entire user interface is managed via templates. The library comes with a number of default templates (HTML) to display the search results and the details selected by the user. The templates can be modified or replaced by custom ones. You can also fine-tune the appearance of the user interface by defining your own style sheets.

The *Data*-only library supports data retrieval, but not data display. As a developer, you can perform searches and retain complete control over the results returned by the Places back-end server. You can process the results, display them or repackage them as you wish.

Architecture in Outline

The Places library includes a widget-based UI library and a Data library. The widgets are classes that combine a means of retrieving places data from a back-end server with support for displaying that data in templated user interfaces.

The UI templates are supported by a templating engine, `jsMotif`, and a set of modules that help render template elements and/or define the behavior of the user interfaces after rendering (for example, determining clickable areas, etc.)

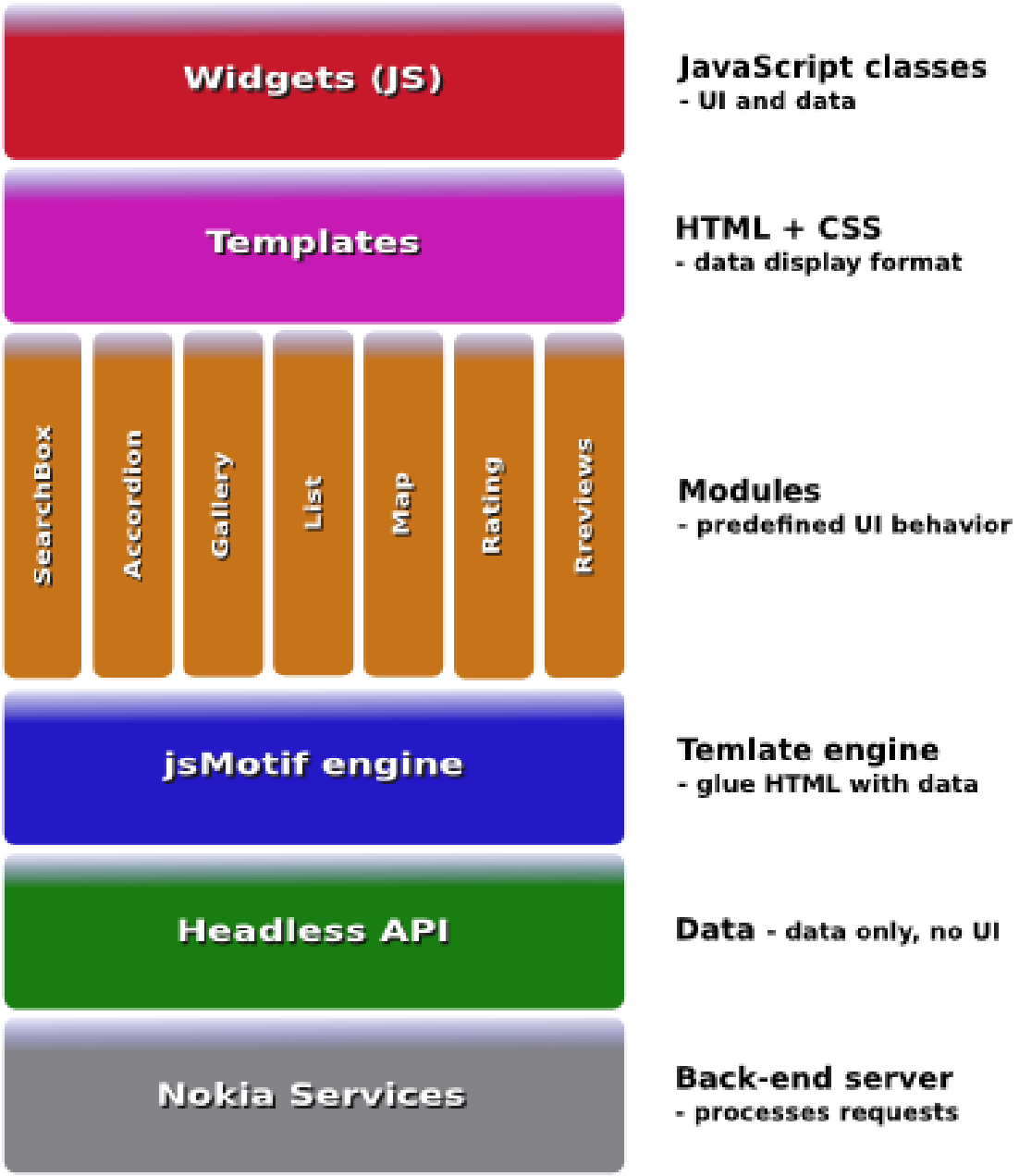
The Data library is about data retrieval independently of user interfaces: as a developer, you retain complete freedom to process the data and display them to meet your requirements.

www.EngineeringBooksPdf.com

The place data constitute the common aspect of the UI and the Data libraries. Their format is identical in both cases.

This outline of the architecture of the library can be represented as a simple stack of boxes, as shown in the figure below.

Figure 13: Elements of the Places library



www.EngineeringBooksPdf.com

Places Widget

This article demonstrates the easiest way to begin using the Places library and display places data on a Web page. It presents a basic usage scenario and explains how to display place-related information in a Web browser.

Simplest Scenario

The simplest scenario is to get and display data relating to a place (location). To do this with the Places library, you need to create an instance of the class `nokia.places.widgets.Place` and tell it which place you are interested in and where to render (display) the data. There are four steps to follow:

1. Use a <script> element in the <head> of your Web page to indicate that you wish to access the Places library file for JavaScript:

```
<script src="http://js.api.here.com/se/2.5.4/jsl.js?with=places"
 type="text/javascript" charset="utf-8"></script>
```

2. Inside the page <body>, add a element and set its `id` attribute, for example, to `"showPlace"` – this is the element, where the place data are to be rendered:

```
<div id="showPlace"></div>
```

3. Provide the application credentials, by calling the method `nokia.Settings()` – note that you need to use the actual `app_id` and `app_code` you have received on registration (please see *Acquiring Credentials* on page 18):

```
nokia.Settings.set("app_id", "YOUR_APPID");
nokia.Settings.set("app_code", "YOUR_TOKEN");
```

4. Also in the <body>, add a `script` tag for the code that creates an instance of the library's `Place` widget class to be able to receive and manage the place data, for example:

```
<script type="text/javascript">
    var place = new nokia.places.widgets.Place({
        placeId: '276u33db-751a77335fcf4e0e80660190aa92f584',
        targetNode: 'place'
    });
</script>
```

Note that the widget is initialized with an object that indicates the place for which to retrieve data and the DOM node where the data are to be displayed. The first is accomplished via the parameter `placeId`, whose value comes from the HERE Places database (for further information, please see *Searching for Places* on page 47 and *Searching for Places (data only)* on page 80. The id of the target DOM node is specified by the parameter `targetNode`.

www.EngineeringBooksPdf.com

Results on the Page

When a Web page containing the code shown above has loaded in the browser, it displays information about the restaurant Lorenz Adlon in Berlin, Germany:

Figure 14: Information about Gourmet Restaurant Lorenz Adlon, Berlin

The code in the examples specifies no details of the display, but simply indicates the place id and where in the HTML page to put the information relating to that place. For everything else, it relies on the Places library defaults such as the language (US English), the default template, etc., to create an interactive user interface filled with data. You can follow the hyper links to view further information as well as pan the map and change its zoom level.

If you wish to show information about a different location, the `SearchBox` widget in the library allows you to get a place id with which you can call the method `setPlace()` defined on the class `Place`. This method call is shown in the example below, where `place` is assumed to be a valid reference to a `Place` instance:

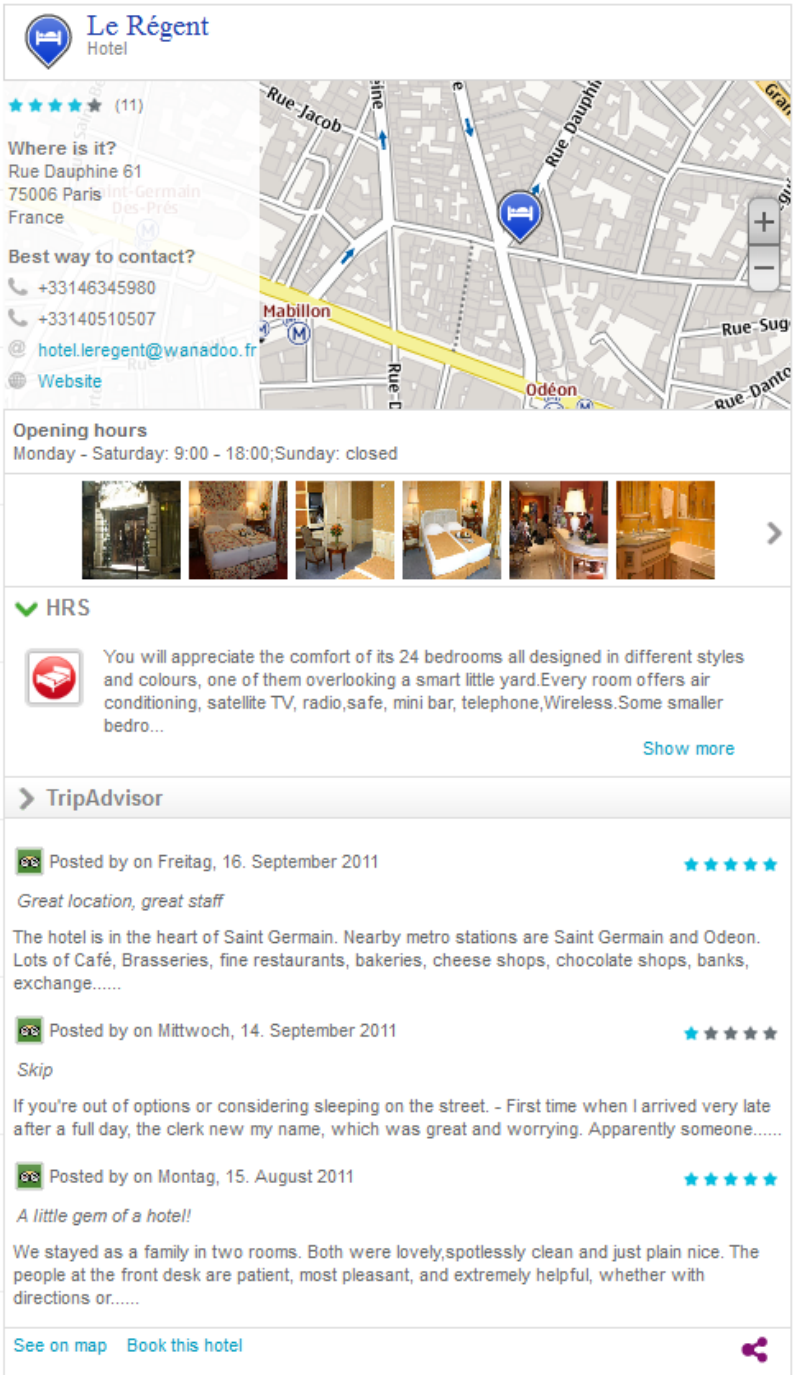
```
place.setPlace(
    {placeId: '250u09tv-fc09ac6bdbe340e9b5e2ad78efc814d0'}
);
```

The object passed to the method `setPlace()` identifies the place via the parameter `placeId`. In this case, the place is the Hotel Le Regent in Rue Dauphine in Paris. Its id comes from the HERE Places database. Note that for locations for which database ids are not available (such as street addresses), you can use `href` whose value is part of the search results (see also *Searching for Places* on page 47 and *Searching for Places (data only)* on page 80).

www.EngineeringBooksPdf.com

Once displayed, the results look a little different than those in the previous example, because they include reviews by visitors to the hotel (you can click on the green chevrons to expand or collapse the review lists):

Figure 15: Information about Hotel Le Regent in Paris



www.EngineeringBooksPdf.com

For further information about the Places library's search functionality, please refer to *Searching for places*.

Searching for Places

The examples in *Places Widget* on page 44 display data, using hard-coded place ids. However, the widget classes `nokia.places.widgets.SearchBox` and `nokia.places.widgets.CategorySearch` from the UI-oriented part of the Places library offer a flexible way of getting place data, and therefore place ids.

SearchBox

`SearchBox` provides an edit box, where the Web site user can enter a search term and run a search by hitting the *Return* key or clicking on the button *Go*. The search term is plain text that contains a street address (for example, "96 Euston Road, London"), a place name (for example "British Museum"), or a broader category name such as "restaurant", or "pizza". The widget picks up this text from the edit box and submits a request to the back-end Places server. The results include place ids for every place found. A place id can be used when instantiating the `Place` class or when calling its method `setPlace()` to display the full details of a place.

To embed place search functionality in a Web page:

- instantiate the `SearchBox` class
- implement the callback to process the search results

The working code below shows the <body> of an HTML page that includes:

- an element to hold a search box, where users can enter a search term
- a list element in which the results of the search are to be displayed.
- a `<script>` element that defines the functionality of the example

In fact, `<script>` merely instantiates `nokia.places.widgets.SearchBox` with a few parameters:

`targetNode`	this is the id of the element from which the widget is to pick up the search criteria entered by the user and where suggestions are shown as the user types
`searchCenter`	this is a function that must return an object with the latitude and longitude of the starting point for the search; the search is run in widening circles starting at this location; when the results are presented to the user, they are ordered by relevance to the search criteria and include the distance from the search center
`onResults`	this a function that handles the search results which it receives as the argument `data`, an array containing information about places matching the user's search criteria (see also below); for each

www.EngineeringBooksPdf.com

element in the array, the function creates a list element and fills it with the place name, then adds it to the <ul> element with the id 'results'

The object `data` passed to the `onResults` has the following structure:

```
{
  search: {
      location: position {
          latitude: 52.516274
          longitude: 13.377678
      }
  },
  results: {
      items: [  //an array of result objects
          {
              position: {
                  latitude: 52.5187
                  longitude: 13.3855
              },
              distance: 596,
              title: 'Il Punto',
              averageRating = 2,
              category: {
                  name: 'Restaurant'
                  categoryId: 'restaurant'
                  icon: 'http://main.local.com/icons/categories/03.icon'
              },
              icon: '../icons/categories/03.icon'
              vicinity: 'Neustädtische Kirchstrasse 6 10117 Berlin
Germany',
              href: '...',
              placeId: '276u33db-78fcd1a2430f4858b3a3db5f9bd98f78'
          },
          {
              position: {
                  latitude: 52.5123291015625
                  longitude: 13.3842091878255
              },
              distance: 624
              ...
      ]
   }
}
```

The first part of this structure is named `search` and its value is an object containi ng one element, `location`. The value of `location` is `position`, or an object containing the coordinates of the search center. The second part, `results`, contains an array named `items` as its value. Each item represents a specific place and contains the following elements:

- `position` – location of the place represented by its geographic coordinates, `latitude` and `longitude`

www.EngineeringBooksPdf.com

- `distance` – the distance of the place from the search center
- `title` – the title/name of the place
- `averageRating` – the average of the place based on ratings submitted by visitors
- `category` – an object that names the POI category for the place; it contains the category name (`name`), id (`categoryId`) and the base URL of the category `icon`
- `icon` – the icon associated with the place
- `vicinity` – the formatted address of the place
- `href` – a place reference from the HERE Places database, can be used to retrieve the full details of the place or location (available for both addresses and places); you can use `href` instead of `placeId` when calling the method `setPlace()` (see *Places Widget* on page 44)
- `placeId` – place indetifier also can be used to retrieve full details of the place (available only for places for which a database record exists); you can use `placeId` instead of `href` when calling the method `setPlace()` (as shown in *Places Widget* on page 44)

For a complete documentation of the contents of `nokia.places.objects.SearchResult`, please consult the API reference, however the details above are important for you to understand how the function `onResults` iterates through `data` and extracts place names.

```
<body>
    <div id="searchbox"></div>
    <ul id="results"></ul>

    <script>
    // Initialize search box:
    var searchBox = new nokia.places.widgets.SearchBox ({
        targetNode: 'searchbox',
        searchCenter: function () {
            return {
                latitude: 52.516274,
                longitude: 13.377678
            }
        },
        onResults: function (data) {
            renderResults (data);
        }
    });

    // Handle the results of the search. This callback function
    // receives the raw places data as an array. For each element
    // in this array, it creates an HTML list element and fills
    // it with the name of the place:
    function renderResults (data) {
        var previewList = document.getElementById ('results');
        previewList.innerHTML = '';

        var results = data.results.items;
```

www.EngineeringBooksPdf.com

```
        for (var i = 0, l = results.length; i < l; i++) {
            var result = results[i];
            var resultLi = document.createElement ('li');
            resultLi.innerHTML = result.title;
            previewList.appendChild (resultLi);
        }
    }
    </script>
</body>
```

This example outputs a static list of place names on the HTML page just below the search box.

CategorySearch

Like `SearchBox`, this widget also allows the Web user to get place data, but the searches it supports are based on POI (Place of Interest) categories. The widget's user interface shows a number of category icons and you can simply click on one of them to run a search.

We can adapt the `SearchBox` example for a simple demonstrate of how to run a category search.

First, let us change the elements:

```
<div id="categorysearch"></div>
<ul id="results"></ul>
```

After that, the script needs to create an instance of `CategorySearch`, giving it a target node, a `searchCenter` function and an a function to call when the results are ready. This last function can be identical to `renderResults()` we used in the `SearchBox` example.

```
var csSearchBox = new nokia.places.widgets.CategorySearch({
    targetNode: 'categorysearch',
    searchCenter: function () {
        return {
            latitude: 52.516274,
            longitude: 13.377678
        }
    },
    onResults: function (data) {
        renderResults (data);
    }
});
```

Even though the user must click on a category icon to trigger a search, the results (if any) are displayed as a list underneath the with the id "categorysearch". Again, it is a static list.

In the next section, however, we look at how to make the initial search results interactive so that the user can click on a place name and view the full details.

here

www.EngineeringBooksPdf.com

Displaying Place Details

The scenario in this article expands on *Searching for places*. The Web user can run a search from a search box, view the initial results as a list, but then he/she can click on an item in the list to view the full details of a place. The added bonus of this scenario is that it offers a simple introduction to event handling in the Places library.

On the Web page, the search box and the initial results appear on the left-hand side, while the details of the place the user selects on the right. To achieve this, the top of the <body> of the page contains these elements:

```
<div style="width: 32%; float: left;">
    <div id="searchbox"></div>
    <ul id="results"></ul>
</div>
<div style="float: left" id="detail"></div>
```

These HTML elements set the layout, but there must also be a `<script>` element to define the functionality. To create an interactive list of search results with clickable place names, it uses `nokia.places.widgets.SearchBox` in conjunction with `nokia.places.widgets.ResultList`. It first instantiates `ResultList` with the following parameters:

`targetNode`	contains the id of the HTML element where the list of places is to appear
`perPage`	indicates how many items are to be shown per page (depending on the size of the search results, the list may occupy more than one page)
`events`	an array parameter that defines what events to associate with the list of results and how to handle them; we want to handle mouse clicks on place names, so there is only one element in the array with the following parameters: • `rel` – the value of the `rel` attribute in the HTML element(s) to which the event is related; the class `ResultList` uses a template named `nokia.general.resultlist` provided as part of the Places library that defines an HTML list to hold the search results, where each item includes a paragraph element (<p>) with the attribute `rel` set to 'nokia-place-name'; when the template is rendered on the page, each list element is populated with the search results data and the paragraph with the attribute `rel` receives the name of the place; see also *Template attribute reference (jsMotif)* • `name` – the name of the event to handle; the supported event names are 'keydown', 'keyup', 'keypress', 'click', 'dblclick', 'mousedown', 'mousemove', 'mouseout', 'mouseover', 'mouseup', 'mouseenter', 'mouseleave', 'blur', 'change', 'focus', 'reset', 'select', 'submit', 'abort' • `handler` – a function to be called when the event has been fired (when the Web user has clicked on a place name in the results list); this handler creates an instance of `nokia.places.widgets.Place`, passing to it the id of the place the user selected from the results and the id of the DOM node where the details are to be shown

www.EngineeringBooksPdf.com

Next, <script> instantiates nokia.places.widgets.SearchBox much as in *Searching for places*, except onResultsnow simply calls resultList.setData(). In other words, onResults passes the results it has received on to the available instance of nokia.places.widgets.ResultList, which displays them, using the template nokia.general.resultlist and associating the list elements with the click event handler.

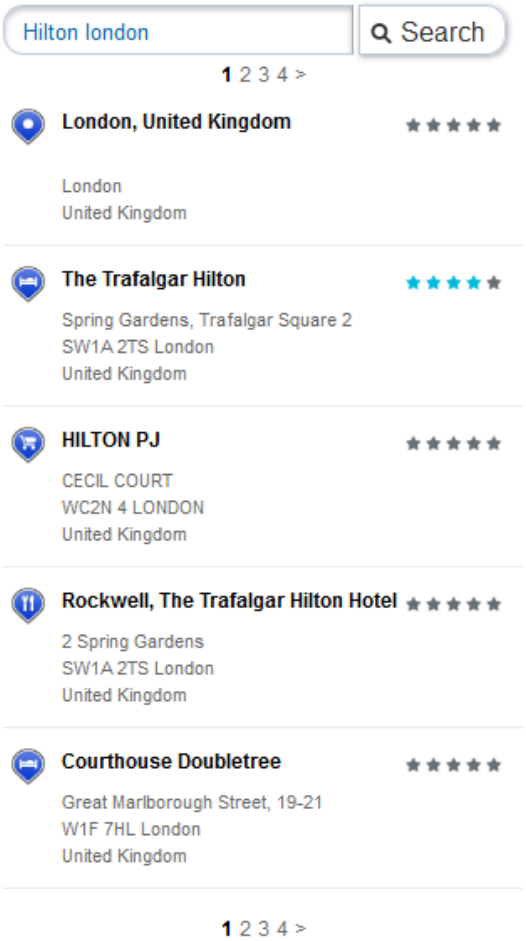
Here is the complete code listing for the <script> element:

```
<script>
    // Initialize a ResultList to create a clickable
    // list of search results. When the user clicks
    // on a place name, the handler function gets the
    // corresponding place details and displays them
    // in the 'detail' div:
    var resultList = new nokia.places.widgets.ResultList ({
        targetNode: 'results',
        perPage: 5,
        events: [{
            rel: 'nokia-place-name',
            name: 'click',
            handler: function (jsonObj) {
                var pp = new nokia.places.Place ({
                    placeId: jsonObj.placeId,
                    targetNode: 'detail'
                });
            }
        }]
    })

    // Initialize search box:
    var searchBox = new nokia.places.widgets.SearchBox ({
        targetNode: 'searchbox',
        searchCenter: function () {
            return {
                latitude: 52.516274,
                longitude: 13.377678
            }
        },
        onResults: function (data) {
            resultList.setData(data);
        }
    });

</script>
```

www.EngineeringBooksPdf.com

When the page is displayed and the user has run a search for 'Hilton London', for example, the results appear as in the figure below.

Figure 16: User interface with initial results

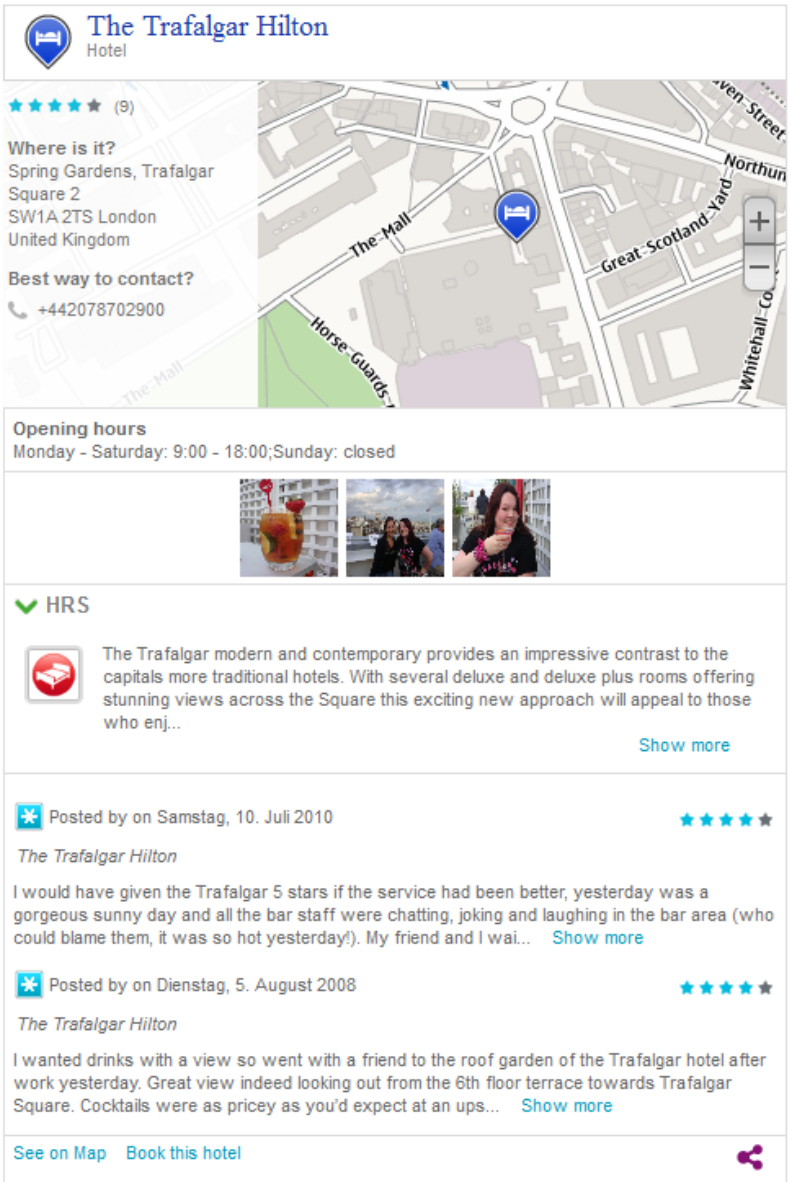


For each item in the list, a category icon is shown on the left (here, the first icon is for a place/town, the remaining ones are hotel icons), followed by the name of the place, with the address underneath and the customer/user rating to the right. In this case, the results occupy four pages, so the interface offers a menu of page numbers above and below the list. If the user selects the second

www.EngineeringBooksPdf.com

page by clicking on '2' in this menu, and then clicks on the second item in the list, the display changes to add the details of the selected place:

Figure 17: User interface with detail display



The full details are rendered using another template that is provided by default with the Places library, `nokia.general.place` and include the place name, address, contact, and location map, followed by a list of customer reviews underneath. At the bottom, there is a short menu that:

www.EngineeringBooksPdf.com

- allows you to view the place on the map – it presents a more detailed map view than in the photo above
- share the place on *facebook* or *twitter*
- reserve a room in the hotel

The last menu item expands when the Web user hovers over it with mouse to show a sub-menu of links to sites on which the user can complete a hotel booking:

Figure 18: "Book this hotel" sub-menu

Note that the item "Book this hotel" is available only for those hotels whose place data include reservation URLs.

As you have been able to observe, the use of templates is at the heart of the UI-oriented Places library. Thus far, we have shown examples that use the default templates, but next, we look at the templating engine more closely not only to show what templates are included as standard, but also how you can customize them.

Making Sure the Widget Is Ready

The widgets `Place`, `SearchBox`, `CategorySearch` and `ResultList` make searching and displaying places data easy. However, it is essential to bear in mind that widgets must be initialized, which involves establishing communication with the Places back end, and then they must be fully loaded, and that means loading the templates from the server (or from a custom location) and loading translations from the server and applying them to the templates. This process is asynchronous and there is simply no way to predict how long it may take. Even more critical is the fact that unless a widget is fully initialized and loaded, you cannot call its methods, so you cannot examine or set data, therefore you cannot display data, at least not until the widget is ready.

For this reason, the widget parent class (`nokia.places.widgets.Widget`) and therefore also`Place`, `SearchBox`, `CategorySearch` and `ResultList` support an initialization parameter named `onReady`.

The value of `onReady` is a callback function. It is guaranteed to be called as soon as the widget is fully initialized and loaded, and thus, when it is safe to call its methods. To show how it works, we can modify the example

```
<script>

    // Initialize a ResultList to create a clickable
    // list of search results. When the user clicks
    // on a place name, the handler function gets the
```

www.EngineeringBooksPdf.com

```
    // corresponding place details and displays them
    // in the 'detail' div:
    var resultList = new nokia.places.widgets.ResultList ({
        targetNode: 'results',
        perPage: 5,
        events: [{
            rel: 'nokia-place-name',
            name: 'click',
            handler: function (jsonObj) {
                var pp = new nokia.places.Place ({
                    placeId: jsonObj.placeId,
                    targetNode: 'detail'
                });
            }
        }]
    })

    // Initialize search box:
    var searchBox = new nokia.places.widgets.SearchBox ({
        targetNode: 'searchbox',
        searchCenter: function () {
            return {
                latitude: 52.516274,
                longitude: 13.377678
            }
        },
        onReady: function () {
            this.registerResultList(resultList);
        }
    });

</script>
```

You may have noticed that this example is very similar to that in *Displaying Place Details* on page 51, the only difference being `onReady`. The function which is the value of `onReady` binds the place list to the search box, which causes place data to be rendered by the place list. This code guarantees that the `SearchBox` widget is fully initialized and loaded before the data are rendered for display.

Places Library Templates

The Places widgets rely on templates to set up the lay-out of the user interface and to determine what information is displayed and how. This section:

- explains the templating engine used by the Places library
- shows the anatomy of a template, including its structure and the supported template element attributes and modules
- shows how to create and use a simple custom template
- provides a reference to the Places library templates

www.EngineeringBooksPdf.com

- provides a reference to the Places library template element attributes

Working with Templates

A template is a hierarchy of HTML elements that define a (part of) the user interface and include instructions for populating it with data. The look and feel of the rendered user interface is determined by a style sheet (CSS).

Templating Engine and Extensions

A module named jsMotif, which is integrated into the Places library provides the templating engine. Its `Template` class creates a template instance on the basis of:

- an HTML string that defines the template structure or ...
- the id of an HTML element to be used as a template or ...
- a reference to an existing DOM node to be used as a template or ...
- a string identifying the template with its full name and namespace

In addition, you can specify the target node, that is the HTML element to which the template is to be applied, and you can specify how events that affect parts of the template are to be handled (in other words, you can set the behavior of the user interface).

Very important to mention here is also the fact that jsMotif defines a number of attributes that can be used in the HTML elements in a template. These attributes allow you specify sub-templates, fill template elements with data, and even show and hide elements, depending on whether the data required to populate them are available. For full details, refer to *Template attribute reference (jsMotif)*.

One of those attributes is `fill` whose purpose is to fill an HTML element with data. The value of `fill` can be obtained, using the functions in jsMotif's namespace `selector`: the functions allow direct access to properties of a `Place` object in a similar way to XPath.

The class `nokia.places.ui.Template` and the namespace `nokia.places.ui.templateFunctions` extend the templating engine. The first defines a template element attribute `module` through which you can reference a module implementing UI behavior – a number of such modules are provided with the library and are documented in the *API reference* (see also *Modules* on page 63). `nokia.places.ui.templateFunctions` provides functions you can use in addition to those in `selector` to extract data from a Place object.

Template Structure

The following rules apply to a template:

- it contains a hierarchy of HTML elements

www.EngineeringBooksPdf.com

- the elements can use any standard HTML attributes and the attributes supported by Places templating engine to:
  - identify a sub-template
  - fill elements with data from a JSON object representing a Place
  - specify modules that help render an element and/or define its behavior after rendering – for example, a module can create a clickable list of icons representing stars; the user can rate a place by clicking on the stars
  - mark elements as targets for modules or events (such as clicks)
- in the HTML page part of which the template is to generate, it must be referenced by its parent (or target) element – a Places template must be identified by its full name including the namespace, for example `<div tpl="nokia.general.map"></div>`, but a custom template can be defined as an HTML string or as an HTML element in the same page so that it can be referred to by its id, and finally any HTML element with a unique id can be used as a template (see also *A custom template* below)

Template reference in this guide lists all the standard templates provided with the Places and discusses them briefly. For example, the template *place* nests other templates via the attribute `tpl`. It also displays elements conditionally and fills them, using selectors. *searchbox* demonstrates the use of the attribute `module` and `rel` to mark an element as a module target.

A Custom Template

This section builds on the material in *Templating engine and extensions* and *Anatomy of a template*. Please refer also to *Template attribute reference (jsMotif)*.

Predefined templates can save time and effort, but there may be occasions when a custom template is required. For example, you might have a requirement to make a template that shows the name and address of a place and displays related images.

The data with which the template has to work come from a JSON object similar to the one shown below:

```
{
    name: 'Le Marfil',
    contact: {
        phone: [{
            label: 'Home away from home',
            value: +1081111111
        }]
    },
    location: {
        address: {
            city: 'Paris',
            street: 'Rue Auguste Vacquerie',
```

www.EngineeringBooksPdf.com

```
            house: '4',
            country: 'France',
            text : "4 Rue Auguste Vacquerie<br/>75116 Paris<br/>France"
        }
    },
    images: [
        {
            supplier: {
                name: 'WCities'
            },
            URL: 'http://image.com/image.jpg'
        },
        {
            supplier: {
                name: 'orange'
            },
            URL: 'http://image.com/image.png'
        },
        {
            supplier: {
                name: 'WCities'
            },
            URL: 'http://image.com/image.gif'
        }
    ]
}
```

Please note that the object above is provided here as a reference for the following discussion and its structure is simplified compared to the structure of data objects that the Places library actually retrieves.

The following code creates a paragraph filled with the name of the place.

```
 <p fill="{name}"></p>
```

Next, the address, which we can get with a function defined in `nokia.places.ui.templateFunctions`:

```
<p fill="{formattedAddress()}"></p>
```

Finally, we need a list of images from the data object, but only those for the provider 'orange'. The following line creates a list item:

```
<ul each="{images[supplier.name=='orange']}">
    <li fill="{URL}"></li>
</ul>
```

www.EngineeringBooksPdf.com

The assembled template can be defined like this – this is the full `<script>` and HTML element version:

```
<script id="myTemplate" type="text/template">
<div>
    <p fill="{name}"></p>
    <p fill="{formattedAddress()}"></p>

    <ul each="{images[supplier.name=='orange']}">
        <li fill="{URL}"></li>
    </ul>
</div>
</script>
```

The implications of the above definitions are:

- the template is the contents of the `<script>` element and it must be identified by the id of `<script>`
- although the template defines a complete HTML node, this node is not rendered on the page (it is not visible), unless the template is referenced in a Places library call
- to render a page element using this template, it is necessary to define a target node, which is the node to which the template is to be applied

Here is the code that fills the prepared template with data from the received `object`:

```
var place = new nokia.places.widgets.Place({
    template: "myTemplate",
    targetNode: "renderMyTemplateHereId"
});

place.setData (object);
```

Note that the parameter object passed to the constructor for `nokia.places.widgets.Place` references our template and the target node. The latter implies that the page contains an element such as this:

```
<div id="renderMyTemplateHereId"></div>
```

However, this template is very simple, so you might wish to define it as an HTML string instead:

```
var myTemplate = '<div><p fill="{name}"' +
    'class="place-name"></p><p fill="{formattedAddress()}">' +
    '</p><ul each="{images[supplier.name==\'WCities\']}">' +
    '<li fill="{URL}"></li></ul></div>';
```

www.EngineeringBooksPdf.com

To apply the template, the constructor for `nokia.places.widgets.Place` must be passed a reference to it:

```
var place = new nokia.places.widgets.Place({
    template: myTemplate,
    targetNode: "renderMyTemplateHereId",
    onReady : function() {
        this.setData(object)
    }
});
```

The function provided as the value of the parameter on `onReady` ensures that the template is populated from the data object defined at the beginning of this section.

A further possibility is to use one of the elements from the HTML page as a template. For example, a page is likely to contain a number of `<div>` elements, and one of them could act as a template (here we reuse the template we have defined earlier):

```
<div id="pageTop"><p>Fixed content at the top of the page</p></div>
<div id="myTemplate">
    <p fill="{name}" class="place-name"></p>
    <p fill="{formattedAddress()}"></p>

    <ul each="{images[supplier.name=='WCities']}">
        <li fill="{URL}"></li>
    </ul>
</div>
<div id="renderMyTemplateHere2Id"></div>
```

All these elements are visible on the Web page. Let us assume that the `<div>` with the id "pageTop" uses fixed content (here it is only text). The other two `<div>` elements must be populated with data to be rendered and laid out on the pattern defined by the `<div>` with the id "myTemplate". The code below makes this happen:

```
var place1 = new nokia.places.widgets.Place({
    placeId: '276u33db-751a77335fcf4e0e80660190aa92f584',
    template: "myTemplate"
});

var place2 = new nokia.places.widgets.Place({
    placeId: '250u09tv-fc09ac6bdbe340e9b5e2ad78efc814d0',
    template: "myTemplate",
    targetNode: "renderMyTemplateHere2Id"
});
```

This code makes no attempt to set place id's dynamically, because we want to keep the focus on template issues. The first call to the `Place` constructor names the place id and the template, but there is no need to specify a target node: it is implicitly the template's own `<div>`. In the second, a target node is necessary, otherwise the new data would overwrite those in `<div id="myTemplate">`.

www.EngineeringBooksPdf.com

Please note that to identify a template or target node, for example when constructing a `Place` instance, you can use the id of the appropriate node directly (as in the code above), or you can use a node reference:

```
var node = document.getElementById("myTemplate");
...
var place = new nokia.places.widgets.Place({
    placeId: '276u33db-751a77335fcf4e0e80660190aa92f584',
    template: node
});
```

Customizing Category Icons in Templates

Place information returned as part of search results (see also *Searching for Places* on page 47, *Searching for Places (data only)* on page 80) includes POI category data such as category name, and icon URL. The following excerpt from a template uses them, allowing a container to display the place name, the associated category icon and category name.

```
<div class="custom-name-container">
    <img url="{categories[0].iconURL}" class="custom-category-icon">
    <p fill="{name}" class="custom-name" rel="name-click"></p>
    <p fill="{categories[0].name}" class="custom-category"></p>
</div>
```

The category icon URL retrieved here is the standard platform one, the base URL. However, you can modify it to retrieve usage-specific icons instead of the default ones. This is done by appending to the base URL the icon type specifier, conforming to the following pattern:

```
%THEME%.%USAGE%.%EXTENSION%
```

In this pattern, `%THEME%` must be set to "web" and the only supported value for `%EXTENSION%` is "png". A usage specifier must be one of:

- `map` – each icon shows a white image representing the category on a blue background in the shape of a hot air balloon, with a gray shadow (circle) at the bottom of the image
- `list` – each icon shows a white image on a blue background in the shape of a hot air balloon, without a shadow (circle)
- `category_symbols` – each icon shows a small black image representing the category
- `category_symbols_light` – each icon shows a white image with a transparent background

For example, to modify the template above so that the Web page displays the relevant category symbol, append `".web.category_symbols.png"` after the closing brace in the `url` attribute of the `img` element as shown below:

```
<div class="custom-name-container">
    <img url="{categories[0].iconURL}.web.category_symbols.png"
```

www.EngineeringBooksPdf.com

```
        class="custom-category-icon">
    <p fill="{name}" class="custom-name" rel="name-click"></p>
    <p fill="{categories[0].name}" class="custom-category"></p>
</div>
```

Modules

The purpose of a module in the Places library is to define the behavior of the user interface when places data have been rendered for display with the help of a template. In addition, some modules assist in the process of data rendering.

Modules are components defined in the namespace `nokia.places.ui.modules`.

To use a module:

- reference the module in the template that creates the user interface through the value of the element attribute `module` (see also *Template attribute reference (jsMotif)*)
- if the module requires it, ensure that the template elements that are targets for the module are identified by the attribute rel (see also *Template Attribute Reference (jsMotif)* on page 71) and *Api reference*, *UI library*, *modules*)
- pass the module initialization parameters to the widget that uses the template, when the widget is instantiated

The template below modifies the one we made in *A custom template* by making the module `List` determine the behavior of the list of images: the display is to be paginated, with one image per page, and there is to be a menu showing clickable page numbers. To make this happen, a element with the attribute `module` wraps <ul> and <ul> itself contains a `rel` attribute set to "list-data".

```
<div id="myTemplate_list">
    <p fill="{name}"></p>
    <p fill="{formattedAddress()}"></p>

    <div module="List">
        <div rel="list-pagination"></div>
        <ul each="{images[supplier.name=='orange']}"
            rel="list-data">
            <li fill="{URL}"></li>
        </ul>
    </div>
</div>
```

To display the place data, an instance of `nokia.places.widgets.Place` is necessary. Its initialization must include the template id and `moduleParams` for the module `List`, specifying how many items are to appear on each page. Finally, the place data must be given to the instance of `nokia.places.widgets.Place`:

```
var place = new nokia.places.widgets.Place ({
    template: "myTemplate_list",
```

www.EngineeringBooksPdf.com

```
    moduleParams: {
        'List': {
            perPage: 1
        }
    }
});

place.setData(object);
```

For further information about the available modules and module initialization parameters, please refer to the *API reference*.

Template Reference

This section offers a reference to the templates provided with the Places API.

The section describes each template and provides a complete listing. Our purpose is both to help you understand the default behavior and also to provide examples that can be used when defining custom templates.

searchbox

The template `searchbox` defines an HTML page element that displays a search box, where the Web user can enter the search term, a button to trigger a search, and a list element to display search suggestions. The top element within the template body uses the attribute `module` with the value "SearchBox" to specify the Places API module that handles the behavior of the rendered template.

```
<div module="SearchBox" class="nokia-searchbox">
    <input class="nokia-searchbox-input" type="text"
        rel="searchbox-input"/>
    <input class="nokia-searchbox-button" type="button"
        rel="searchbox-button" value="___places.search___"/>
    <div rel="searchbox-list" class="nokia-searchbox-list">
        <div class="nokia-searchbox-list-border"></div>
    </div>
</div>
```

resultlist

The `resultlist` template defines an HTML page element that displays a list with information about a number of places. The information results from a search. Each item in the list is rendered to display various items of information relating to a place. The template supports pagination of the list.

www.EngineeringBooksPdf.com

Note that some of the elements in the template are displayed conditionally, depending on the attribute `if`. Other elements are populated with data on rendering, using functions specified in the value of the attribute `fill`.

```
<div module="List">
    <div rel="list-pagination"></div>
    <ul each="{results.items}" rel="list-data"
        class="nokia-place-list">
        <li class="nokia-place-list-elem">
            <div class="nokia-list-elem-left">
                <div class="nokia-general-category-pin">
                    <span class="nokia-general-list-index"
                        addClass="{indexDigits()}" fill="{_index}">
                    </span>
                </div>
                <div class="nokia-general-categoryicon" addClass=
                 "nokia-general-categoryicon-dark-{iconCategory()}">
                </div>
            </div>
            <p fill="{title}" rel="nokia-place-name"
                class="nokia-place-name">
            </p>
            <div class="nokia-place-address" fill="{vicinity}">
            </div>
            <div tpl="nokia.general.rating" if={placeId}></div>
        </li>
    </ul>
    <div rel="list-pagination"></div>
</div>
```

place

The `place` template is the default template supplied with the Places API library to render full place data. It includes a number of other Places API templates via the attribute `tpl`.

Note that some of the elements in the template are displayed conditionally, depending on the attribute `if`. Other elements are populated with data on rendering, using functions specified in the value of the attribute `fill`.

```
<div tpl="nokia.general.name" class="nokia-place-header"></div>
 <div class="nokia-places-general-map">
    <div class="nokia-place-left" if="{isPlace()}">
        <div tpl="nokia.general.rating"></div>
        <div tpl="nokia.general.address"></div>
        <div tpl="nokia.general.contact"></div>
    </div>
    <div tpl="nokia.general.map"></div>
</div>
<div class="nokia-place-bottom">
    <div class="nokia-place-opening-hours"
        if="{extended.openingHours}">
```

www.EngineeringBooksPdf.com

```
        <strong>___places.bubble.openingHours___</strong><br>
        <p fill="{extended.openingHours.text}"></p>
    </div>
    <div class="nokia-place-payment-methods" if="{extended.payment}">
        <strong>___places.bubble.paymentmethods___</strong>
        <p fill="{extended.payment.text}"></p>
    </div>
    <div if="{media.images.items.available}"
        tpl="nokia.general.gallery">
    </div>
    <div class="nokia-place-owner-content" fill=
    "{media.editorials.items[supplier.supplierId==primeplace]
[0].description}">
    </div>
    <div tpl="nokia.general.premium"></div>
    <div tpl="nokia.general.reviews"></div>
    <div tpl="nokia.general.sharemenu"></div>
</div>
```

address

The `address` template defines HTML page elements that display street address, zip/postal code, city and country name.

```
<strong>___places.incident.whereisit___</strong><br>
<span fill="{location.address.text}"></span>
```

contact

The `contact` template defines HTML page elements that display place-related contact details such as telephone number, e-mail, fax and Web site URL.

```
<div class="nokia-place-contact" if="{contacts}">
    <strong>___places.incident.howtocontact___</strong>
    <p class="nokia-place-phone" fill="{primaryPhone()}">
    </p>
    <p class="nokia-place-mobile-phone" fill="{primaryMobile()}">
    </p>
    <p class="nokia-place-fax" fill="{primaryFax()}"></p>
    <p class="nokia-place-email"><a mailto="{primaryEmail()}"
        fill="{primaryEmail()}"></a></p>
    <p class="nokia-place-website-url"><a url="{primaryURL()}"
        fill="{primaryURLLabel()}"></a></p>
</div>
```

www.EngineeringBooksPdf.com

gallery

The template `gallery` is intended to display a collection of pictures relevant to a place. The template supports display of thumbnails and larger images.

```
<div module="Gallery" class="nokia-place-gallery">
    <div rel="gallery-full-screen"
        class="nokia-place-gallery-full-screen">
        <div rel="gallery-overlay"
            class="nokia-gallery-big-overlay">
        </div>
        <div rel="gallery-preview-box"
            class="nokia-gallery-preview-box">
            <div class="nokia-gallery-preview-inner">
                <span rel="gallery-img-provider"
                    class="nokia-gallery-provider"></span>
                <span class="close-preview">
                    <a rel="gallery-big-close"></a>
                </span>
                <a rel="gallery-big-previous"
                    class="nokia-gallery-big-previous"></a>
                <a rel="gallery-big-next"
                    class="nokia-gallery-big-next"></a>
                <img rel="gallery-big-img"
                    class="nokia-gallery-preview-img"/>
            </div>
        </div>
    </div>
    <div class="nokia-place-small-gallery">
        <div rel="gallery-previous"
            class="nokia-place-gallery-previous">
        </div>
        <div rel="gallery-list"
            class="nokia-place-gallery-list">
            <img rel="gallery-img" />
            <img rel="gallery-img" />
            <img rel="gallery-img" />
            <img rel="gallery-img" />
            <img rel="gallery-img" />
            <img rel="gallery-img" />
        </div>

        <div rel="gallery-next"
            class="nokia-place-gallery-next">
        </div>
    </div>
</div>
```

www.EngineeringBooksPdf.com

map

The `map` template defines an HTML page element that displays a map of the place and map zoom controls.

```
<div module="Map" class="nokia-place-map">
    <div rel="map-container" class="nokia-place-map-container"></div>
    <a rel="zoom-in" class="nokia-place-zoom-in"></a>
    <a rel="zoom-out" class="nokia-place-zoom-out"></a>
</div>
```

name

The `name` template defines HTML page elements that display place identifiers such as name, title, category icon, category (icon).

```
<p fill="{name}" class="nokia-place-name" rel="name-click"></p>
<p class="nokia-place-name-bottom">
    <span fill="{categories[0].title}"
        class="nokia-place-category">
    </span>
    <span if={supplier} class="nokia-place-source">
        ___places.bubble.source___:
        <span fill="{supplier.name}">
        </span>
    </span>
</p>
```

premium

The `premium` template defines page elements that display premium content information including provider's name, icon and description. These elements belong to a premium content item, which is one in a list of such items.

Note that some of the elements in the template are populated with data on rendering, using functions specified in the value of the attribute `fill`.

```
<div module="Accordion" each="{primaryDescriptions()}"
                    class="nokia-place-premium">
    <div class="nokia-place-premium-header" rel="accordion-header">
        <div class="nokia-place-premium-provider"
            fill="{supplier.name}">
        </div>
    </div>
    <div class="nokia-place-premium-body" rel="accordion-body">
        <img url="{supplier.icon}">
```

www.EngineeringBooksPdf.com

```
        <div module="Expandable"
          class="nokia-place-premium-content">
          <div rel="expand-text" fill="{description}">
          </div>
          <a rel="expand-show"
          class="nokia-expand">___places.detailcontainer.showMore___
            </a>
        </div>
        <div class="nokia-place-clear"></div>
    </div>
</div>
```

rating

The `rating` template defines a page element that displays a list of customer/user ratings for a place.

```
<div module="Rating" class="nokia-place-ratings-container">
    <ul rel="rating-list">
        <li rel="rating-star1"></li>
        <li rel="rating-star2"></li>
        <li rel="rating-star3"></li>
        <li rel="rating-star4"></li>
        <li rel="rating-star5"></li>
    </ul>
    <span rel="rating-count" class="nokia-place-rating-count"></span>
</div>
```

reviews

The `reviews` template defines an HTML page element that displays a list of customer/user reviews of a place.

Note that other Places API templates are included using that attribute `tpl`. Some of the template elements are populated with data, using the attribute `fill`.

```
<div module="Reviews">
    <div  if="{available!=0}" class="nokia-place-reviews">
        <ul each="{items}">
            <li class="nokia-place-review">
                <a url="{via.href}">
                    <img class="nokia-place-review-vendor-img"
                        url="{supplier.icon}">
                </a>
                <p class="nokia-place-review-metadata"
                    rel="vendor-click">
                    <span fill="{reviewMetaData()}">
                    </span>
                </p>
```

www.EngineeringBooksPdf.com

```
                <div tpl="nokia.general.rating"></div>
                <a url="{via.href}"
                    class="nokia-place-review-title"
                    fill="{title}"></a>
                <div module="Expandable">
                    <div class="nokia-place-review-body"
                    rel="expand-text"
                    fill="{description}"></div>
                    <a rel="expand-show"
                    class="nokia-expand">
                        ___places.detailcontainer.showMore___
                    </a>
                </div>
            </li>
        </ul>
        <div class="nokia-place-clear"></div>
    </div>
</div>
```

sharemenu

The template `sharemenu` defines an HTML page element that displays a small menu, allowing the Web user to share the given place. In addition, it includes a menu item labeled "Book this hotel" (for places that offer a booking URL). The behavior of an interface generated from this template is managed via the module `ShareMenu`.

```
<div module="ShareMenu" class="nokia-place-sharemenu">
    <div class="nokia-place-share-link-container"
        rel="sharemenu-link-container">
        <a rel="sharemenu-link" class="nokia-show-map"
            target="_blank" title="___places.player.seeOnTheMap___">
            ___places.player.seeOnTheMap___</a>
        <a class="nokia-book-link" if="{media.links.available!=0}"
            rel="sharemenu-booking-link"
            title="___places.hotelbooking.basic___">
            ___places.hotelbooking.basic___</a>
        <a href="#" rel="sharemenu-share"
            class="nokia-sharemenu nokia-share"
            title="___places.bubble.menu.share___"></a>
    </div>
    <div  class="nokia-place-share-booking-container"
        rel="sharemenu-booking-container">
        <ul each="{media.links.items}"
            class="nokia-booking-menu">
            <li>
                <a target="_blank" url="{url}"
                    class="nokia-book-icon">
                    <img url="{supplier.icon}">
                </a>
                <a target="_blank" url="{url}"
                    class="nokia-book-link">
                    <span fill="{supplier.name}"></span>
```

www.EngineeringBooksPdf.com

```
                </a>
            </li>
        </ul>
        <a href="#" rel="sharemenu-booking-cancel"
            class="nokia-place-share-cancel">
                ___places.incident.cancel___</a>
    </div>
    <div class="nokia-place-share-container"
        rel="sharemenu-share-container">
        <a rel="share-facebook" class="nokia-share-fb"
            target="_blank">
        </a>
        <a rel="share-twitter" class="nokia-share-tw"
            target="_blank">
        </a>
        <input type="text" rel="sharemenu-input">
        <a href="#" rel="sharemenu-cancel">
            ___places.incident.cancel___</a>
    </div>
</div>
```

Template Attribute Reference (jsMotif)

This section documents the complete set of template HTML element attributes supported by the Places API. Most of these attributes are implemented by `jsMotif` and one, `module`, is implemented by the Places API `class nokia.places.ui.Template`.

Note that the values of the attributes each, `fill`, `if`, `mailto` and `url` can be determined by accessing data held in an available Places API object, using `jsMotif.selector` or a member of `nokia.places.ui.templateFunctions`. Both `jsMotif.selector` or a member of `nokia.places.ui.templateFunctions` treat the object from which data is to be extracted as a hierarchy whose elements are addressable in a similar way to XPath. This is very clear when using `selector`, because to access the value of an element, you need to use the full path to the element within the object, naming each element along the path and separating them with a dot (please see the examples below).

The examples that illustrate the documentation below reference elements in the following object:

```
{
    name: 'Le Marfil',
    contacts: {
        email: [
          {
            label: 'email',
            value: 'info@lemarfil.fr'
          }
        ]
    },
    location: {
```

www.EngineeringBooksPdf.com

```
        address: {
            city: 'Paris',
            street: 'Rue Auguste Vacquerie',
            house: '4',
            country: 'France'
        }
    },
    media:{
      images:{
          items: [
          {
              supplier: {
                  name: 'WCities'
              },
              src: 'http://image.com/image.jpg'
          },
          {
              supplier: {
                  name: 'orange'
              },
              src: 'http://image.com/image.png'
          },
          {
              supplier: {
                  name: 'WCities'
              },
              src: 'http://image.com/image.gif'
          }
          ]
      }
    }
}
```

Please note that the object shown above is provided as a reference for the following discussion and its structure is simplified compared to the structure of data objects the Places API retrieves.

Attributes

each

The attribute `each` takes as its value an array and causes the template node to be replicated and filled with the elements of the array. In the example below, `each` ensures that a `<ul>` element is created for every item in `media` and populated with the value of the item's property `supplier.name`.

Example:

```
<ul each="{images}"> <li fill="{supplier.name}"></li></
ul>
```

www.EngineeringBooksPdf.com

fill

This attribute fills a node with data (value), which can be taken from a Places API object, but can also include custom text.

Examples:

To access one of the top-level elements such as `name`, you can simply name it.

```
<p fill="{name}"></p>
```

And here is a variation on the previous example, which combines a Place object element and custom text.

```
<p fill="The name is: {name}"></p>
```

To access `label`, you need to use the dot notation.

```
<p fill="{contacts.email[0].label}"></p>
```

The next example uses `fill` in conjunction with `if` and `each`.

```
<ul if="{name=='Le Marfil'}"
 each="{media.images.items}">
    <li>
      <img fill="{src}"></img>
    </li>
</ul>
```

`fill` and `each` allow you to access the contents of every element in an array and you do not need to name it. The array in the example below is `'all urls from the available images'`, which may be part of a place data object retrieved by the Places API. The template code below looks at each item in `seleted array` and fills a list element with the string it contains:

```
<ul each="{media.images.items[].src}">
    <li fill="{.}"></li>
</ul>
```

Note also that `{.}` changes the selection scope to the current element in the array. As a result, you can access any member of the current element directly by name without the need to identify the current element first. Consider the following template excerpt, where `each` is used to iterate through every `result` element in an array named `results.items`, getting the icon

www.EngineeringBooksPdf.com

URL from the first item under (result) `category`, the `title` of the place and the details of the address:

```
<div module="List">
    <div rel="list-pagination"></div>
    <ul each="{results.items}" rel="list-data">
        <li>
            <img url="{category.icon}">
            <p fill="{title}" rel="nokia-place-name"></
p>
            <div class="nokia-place-address"
 fill="{formattedAddress()}"></div>
        </li>
    </ul>
</div>
```

if

`if` allows you to define a test and hide or show the node, depending on the return value. In the example below, the entire `<div>` is shown or hidden, depending on the availability of contact description.

Example:

```
<div if="{contacts.email[0]}">
    <h1>Description:</h1>
    <p fill="{contacts.email[0].value}"></p>
</div>
```

mailto

This attribute allows you to specify an e-mail address in the `href` attribute inside an anchor element. In the example below, a filter is used to set e-mail as a contact type of the first `contact` in the data object, so that the value of `mailto` is set to the e-mail address. Note that the attribute permits mixing elements values extracted from a Place object and custom text (see also the attribute "fill" above).

Example:

```
<a mailto="{contacts.email[0].value}"
 fill="{contacts.email[0].value}"></a>
```

module

This attribute allows you to specify the name of a Places API module.

www.EngineeringBooksPdf.com

Example:

```
<div module="SearchBox"></div>
```

rel

`rel` marks an element as a target for a module (see also the attribute `module`) or for an event.

Most modules require the `rel` attribute and its value must be one of the strings supported by the modules (for details please refer to *API reference*, *modules*).

Examples:

I n the following example, `rel` identifies an `input` element as the target for the module `SearchBox`.

```
<div module="SearchBox" class="nokia-searchbox">
    <input class="nokia-searchbox-input" type="text"
        rel="searchbox-input"/>
    ...
</div>
```

When `rel` identifies an element as a target for an event, the value of the attribute can be any string of your choice, but the same string must be echoed by the value of the `rel` parameter in the `events` array supplied as part of the widget instantiation object.

The example below shows the attribute marking a paragraph element as the target for a click event.

```
<p fill="{name}" class="nokia-place-name" rel="name-
click"></p>
```

tpl

`tpl` allows you to specify a template. The value can be either one of the templates provided with the Places API (in which case, the template name has to be fully qualified with the space name, for example, "nokia.general.address") or the id of a custom template element. Both these possibilities are shown in the examples below

Examples:

```
<div tpl="nokia.general.name" ></div>
```

www.EngineeringBooksPdf.com

```
<div tpl="domElementIdOfMyTemplate"></div>
```

url

The attribute `url` takes as its value the URL of a resource; it provides the `src` attribute and its value for images and the `href` attribute and its value for anchors. Note that the attribute permits mixing elements values extracted from a Place object and custom text (see also the attribute "fill" above).

Example:

```
<img url="{categories[0].icon}">
```

Using Maps and Places Libraries Together

This article discusses a scenario where the Maps programming interfaces and the Places UI interfaces are used together. For an example of using the Maps interfaces and Places data-only interfaces together, please see *Searching for Places* on page 47.

The widget classes in the Places library support an easy way to make use of the HERE Maps. Imagine a scenario in which a Web user pans around an interactive map to find Vietnamese restaurants. The user centers the map on his/her town, then types in "Vietnamese restaurant" into the search box and kicks off the search. Soon, a list of places appears on the page, but also the map displays a number of markers. If the user now clicks on a place name in the list, an info bubble pops up in the map near the icon corresponding to that place. This allows the user to read the details of the place on the page and also view its location on the map.

To support scenarios such as this, the classes `SearchBox`, `Place`, and `ResultList` have an initialization parameter named `map`, and `Place` and `ResultList` include methods named `displayOnMap()`.

The parameter `map` holds a reference to an instance of the class `map.Display`. `SearchBox` uses this parameter to obtain the coordinates of the `searchCenter`: it takes them from the center of the current map view. If the user moves the map, these coordinates change and consequently a new search with the same search term is likely to produce different results. `ResultList` uses the parameter `map` to show places as markers in the map, while `Place`, can display place details in an info bubble next to the appropriate marker.

Several steps are required to implement an application that uses both HERE Places and Maps APIs and we explain them below.

www.EngineeringBooksPdf.com

Implementation – <head>

First, you need to reference the correct library files by adding a <script> element in the <head> of the Web page. For example, if you require the default Maps and Places functionality, you can set the <script> element as follows:

```
<script type="text/javascript" src="http://js.api.here.com/se/2.5.4/
jsl.js?with=maps,places" />
```

Note the query parameter with in the URL. Its value is a comma-separated list of libraries to load. For full documentation of the supported parameters and possible values, please refer to the section *Packages and Detection* on page 8.

Implementation – <body>

The <body> of a page that implements the scenario needs to define the HTML elements in which to display the search box, the search results and the map:

```
<div id="mapSearchbox"></div>
<div id="mapPlacelist"></div>
<div id="mapContainer" style="width: 700px; height: 800px;"></div>
<div style="clear:both"></div>
```

Next, we need a <script> element with the JavaScript code that defines the functionality. The first thing to do here, is to get an instance of the map display:

```
var map = new
 nokia.maps.map.Display(document.getElementById("mapContainer"), {
    'zoomLevel': 10, //zoom level for the map
    'center': [52.51, 13.4], //center coordinates,
    components: [new nokia.maps.map.component.Behavior(),
        new nokia.maps.map.component.TypeSelector(),
        new nokia.maps.map.component.ZoomBar(),
        new nokia.maps.map.component.RightClick()
});
```

The variable map holds a reference to an instance of map.Display. The map is shown on the page inside the element with the id "mapContainer". In addition, the initialization arguments specify the zoom level, the coordinates of the map center, and then a number of components to ensure that the map is fully interactive. For further information, please refer to the *Maps API documentation* on line.

Now, we can use map to instantiate a Places widget.

www.EngineeringBooksPdf.com

The scenario requires a search box, but we want it to use the center of the visible map as the search center. The easiest way to do that is to make our reference to `map.Display` the value of the `SearchBox` initialization parameter `map`:

```
var sb = new nokia.places.widgets.SearchBox({
    targetNode: 'mapSearchbox',
    map: map,
    onResults: function (data) {
        mapPlaceList.setData(data);
    }
});
```

Next, we get an instance of `nokia.places.widgets.Place` that 'knows' about the map, so that it can later display data relating to the place selected by the user from the search results:

```
var mapPlaceWidget = new nokia.places.widgets.Place({
    map: map
});
```

Finally, we need a `ResultList` object to handle the search results is required. Its initialization property `map` must receive the reference to `map.Display` and it needs a function to display the places in the list as markers on the map (this function is the value of the property `onRenderPage`) . The last task is to ensure that when the user clicks on an item in the results list, the details of that item appear in the info bubble next to the item's map marker. This is done via the initialization property `events`. `events` has properties of its own:

`rel`	the id of the HTML node to which an event is to be attached (node's rel attribute)
`name`	the name of the event
`handler`	a function that causes the info bubble to be shown on the map

The code below puts the above information together, creating an instance of `ResultList`:

```
var mapPlaceList = new nokia.places.widgets.ResultList({
    targetNode: 'mapPlacelist',
    map: map,
    onRenderPage: function () {
        mapPlaceList.displayOnMap();
    },
    events: [
        {
            rel:'nokia-place-name',
            name: 'click',
            handler: function (place) {
                mapPlaceWidget.displayOnMap(place);
            }
        }
    ]
```

www.EngineeringBooksPdf.com

```
});
```

Multi-language Support

The Places library for JavaScript supports the same set of languages as the Maps library. For a complete list please see *Multi-language Support* on page 96 .

Places Widget on page 44 shows the simplest way to reference the library an then to instantiate the `Place`widget without specifying a locale. This causes the library to use the default (US English), which means that this is the language of the user interface, the language in which the widget displays all text. To select a different language, you need to include `'locale'` among the initialization parameters for a widget, for example here we set the language to Polish when initializing the `Place` widget:

```
<script type="text/javascript">
    var place = new nokia.places.widgets.Place({
        placeId: '276u33db-751a77335fcf4e0e80660190aa92f584',
        targetNode: 'place',
        locale: 'pl-pl'
    });
</script>
```

Places Data API

The Data API parallels the functionality offered by the UI widgets in that getting data for a place is a two-step process:

1. Perform a search for places – using a search term
2. Request the details of a specific place – on the basis of a place id extracted from the search results

However, the Data API does not offer any user interface support. As a developer, you need to determine the search term, handle the search results and get from them the id or ids for which you obtain detailed data. Finally, once you have received the details, it is up to you, or rather your requirements, how the data are to be handled.

Namespaces and Data

It is instructive to look at the Data API from the point of view of the namespaces and data classes involved. To run a search based on a search term, you need functions defined in the namespace `nokia.places.search.manager`, while the functions in the namespace `nokia.places.manager` retrieve place details (except for one function that posts place ratings to the back-end server).

www.EngineeringBooksPdf.com

Each function in both namespaces takes one argument, which is an object with a number of properties, and each of these input objects includes a property named `onComplete`. This is because the functions are *asynchronous* and you need to use `onComplete` to provide a callback that can receive and process the results (the place data).

The results from `searchManager` functions are instances of `nokia.places.objects.SearchResponseView`.

A `SearchResponseView` has a member element named `results`, which is an array with elements defined by the class `nokia.places.objects.SearchResult`.

A member of `SearchResult` called `place` is an instance of `nokia.places.objects.Place`. It contains a place id (`placeId`) with which you can invoke `placeManager` functions to obtain specific place data.

Here is a list of the `placeManager` functions and the types of data they obtain (again via their `onComplete` functions):

- `getPlaceData()` –`nokia.places.objects.Place`
- `getMedia()` – `nokia.places.objects.List`, a list of `nokia.places.objects.Media`
- `getReviews()` – `nokia.places.objects.List`, a list of `nokia.places.objects.Review`
- `getRating()` – `nokia.places.objects.Review`
- `postRating()` – `nokia.places.objects.Review`

After this quick tour, the following articles offer examples showing how to use the Data API classes to perform searches and then how to obtain the detailed places data.

The last article in this section offers a very brief explanation of what you need to write server-side node.js scripts that make use of the Data API.

Searching for Places (data only)

This article demonstrates how to use the functions defined in the namespace `nokia.places.search.manager`. All the functions obtain a `searchResponsView` that ultimately contains an array of `Place` objects.

Please note that the examples in this article do not show how to process the data returned by Places back-end. To process the data, please refer to the documentation for each of the data classes in the API reference for the Places library. You need to define a function that performs the actual processing – it must be provided as the value of the `onComplete` parameter in each function argument object. In in the examples below, this function is shown as a stub.

www.EngineeringBooksPdf.com

Search Using a Search Center

The function `findPlaces()`, as its name suggests, allows you to search for places. It requires as an argument an object with a number of parameters, among them a search term, an optional `searchCenter`, and `onComplete`, whose value is a function that handles the search results when they become available.

Determining a search term is a matter specific to the application. It can be hard-coded, or more realistically, you can base it on user input.

`searchCenter` is an object that contains the latitude and longitude of a location. It acts as the origin for the search, which runs in increasingly widening circles, trying to match the supplied search term. The returned results, if any, include information about the distance of each item (place) from the search center. Here is an example of the search center object that represents a location in Berlin in Germany:

```
var searchCenter = {
    latitude: 52.516274,
    longitude: 13.377678
}; //Berlin
```

The code below calls `findPlaces()`, using `term` as the value of `searchTerm` (we assume that it is a meaningful text string), an `onComplete` function (empty), and the search center object we defined earlier. `onComplete` accepts two arguments:

- `data` – a `SearchResponseView` object with an `item` property that contains a list of places matching the specified category
- `status` – a string constant indicating success (`'OK'`) or failure (`'ERROR'`) of the call

```
nokia.places.search.manager.findPlaces({
    searchTerm: term,
    onComplete: function(data, status){
        // handle/process data here

    },
    searchCenter: searchCenter
});
```

Search with Geolocation (HTML5)

Browsers that support HTML 5, allow you to share your current location and the `findPlaces()` supports this via the parameter `useGeoLocation`. If this parameter is included in the argument to the function and set to `true`, the user's current location is used as the search center. If `searchCenter` is not provided and `useGeoLocation` is not defined or set to `false`, then a global search is performed.

www.EngineeringBooksPdf.com

The code example below demonstrates a call to `findPlaces()` with `useGeoLocation` set to `true`. `term` is used as the value of `searchTerm` (we assume that it is a meaningful text string). `onComplete` accepts two arguments:

- `data` – a `SearchResponseView` object with an `item` property that contains a list of places
- `status` – a string constant indicating success (`'OK'`) or failure (`'ERROR'`) of the call

```
nokia.places.search.manager.findPlaces({
    searchTerm: term,
    useGeoLocation: true,
    onComplete: function(data, status){
        // handle/process data here
    }
});
```

Search with a Bounding Box

A further possibility is that instead of using a search center or sharing your location you can use a bounding box, which is a rectangular area defined by the coordinates of its top left and bottom right corners. To provide a bounding box, use the parameter `boundingBox` as shown in the following code:

```
nokia.places.search.manager.findPlaces({
    searchTerm: term,
    onComplete: function(data, status){
        // handle/process data here
    },
    boundingBox: {
        topLeft: {
            latitude: 52.33812,
            longitude: 13.08835
        },
        bottomRight: {
            latitude: 52.6755,
            longitude: 13.76134
        }
    }
});
```

Search by Category

This option has to do with searching for places that match a particular Point of Interest category (POIs). The search function to use is `findPlacesByCategory()` defined on `nokia.places.search.manager`. It requires a parameter that is an object with the properties:

- `category` – identifies the POI category; the value is a category id as shown in the table below
- `searchCenter` – an object that contains the latitude and longitude of a location that acts as the origin for the search (see also *Search Using a Search Center* on page 81)

www.EngineeringBooksPdf.com

- `onComplete` – a callback function; it accepts two arguments, `data`, which is a `SearchResponseView` object with an `item` property that contains a list of places matching the specified category, and `status`, which is a string constant indicating success (`'OK'`) or failure (`'ERROR'`) of the call.

The code below uses a hard-coded category id `"eat-drink"` to locate restaurants:

```
nokia.places.search.manager.findPlacesByCategory({
    category: 'eat-drink',
    searchCenter: searchCenter,
    onComplete: function(data, status){
        // handle/process data here
    }
});
```

The following list shows the names and ids of currently supported categories:

Table 8: POI Category Names and Ids

name	categoryId
Administrative Areas & Buildings	administrative-areas-buildings
Transport	transport
Leisure & Outdoor	leisure-outdoor
Business & Services	business-services
Eat & Drink	eat-drink
Natural & Geographical	natural-geographical
Shopping	shopping
Accommodation	accommodation
Going Out	going-out
Sights & Museums	sights-museums

Reverse Geo-code Search

The API class `nokia.places.search.manager` offers a method named `reverseGeoCode()`. A typical use case for it is to retrieve the address of a place on the basis of a set of geographical coordinates. The method is asynchronous, takes one argument, which is an object containing three parameters: `latitude`, `longitude`, and a callback function.

www.EngineeringBooksPdf.com

The callback (`onComplete`) needs to be able to accept two arguments: `responseData`, which is a `Place` object with the results of reverse geo-coding, and `status`, which is a string constant indicating success (`'OK'`) or failure (`'ERROR'`) of the call.

Here is an example showing `revereseGeoCode()` being invoked:

```
nokia.places.search.manager.reverseGeoCode({
    latitude: 52.33812,
    longitude: 13.08835,
    onComplete: function(responseData, status){
        if (status == 'ERROR') {
            // handle error condition
        }
        else {
            // process responseData
        }
});
```

Geo-code Search

The API class `nokia.places.search.manager` includes the method named `geoCode()`. It retrieves the geo coordinates of a place. The method is asynchronous and takes one argument, which is an object containing two parameters: `searchTerm` specified as a String (or `address` specified as a JavaScript object) and a callback function.

The callback (`onComplete`) needs to be able to accept two arguments: `responseData`, which is a `Place` object with the results of geo-coding, containing only address information, and `status`, which is a string constant indicating success (`'OK'`) or failure (`'ERROR'`) of the call.

Here is a piece of code that calls `geoCode()` with a search term:

```
nokia.places.search.manager.geoCode({
    searchTerm: "4 Chancery Lane, London",
    onComplete: function (responseData, status) {
        if (status == 'ERROR') {
            // handle error condition
        }
        else {
            // process responseData
        }
});
```

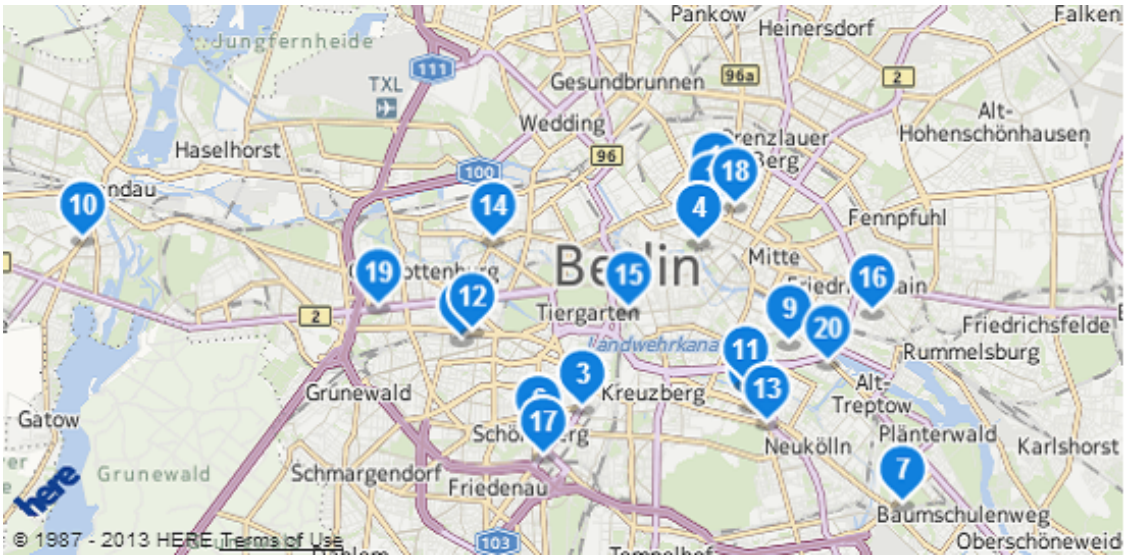
Displaying Search Results on the Map

The example implements a scenario that makes use of both the Maps library and the Places data-only programming interfaces. For an example of using Maps interfaces together with Places widgets, please see *Using Maps and Places Libraries Together* on page 76.

www.EngineeringBooksPdf.com

The application in the example below runs a search for Pariser Platz in Berlin, Germany, and displays the results as markers on the map.

Figure 19: A map with the results of a search request



The implementation shown below instantiates map `Display` class and search `manager`, and then runs a search with the search criteria consisting of the string "pariser platz berlin". Note that the search `manager` method `findPlaces()` receives as one of its arguments a callback function that handles the results. This is required, because searches are asynchronous.

The callback makes sure the search results are displayed on the map by adding each of them to a container and then by adding the container to the map. In addition, the function sets the zoom level to a value no greater than 16 to ensure that all the markers representing the search results are visible.

```
var map = new
 nokia.maps.map.Display(document.getElementById("mapContainer"), {
    components: [ new nokia.maps.map.component.Behavior(),
        new nokia.maps.map.component.TypeSelector(),
        new nokia.maps.map.component.ZoomBar()
    ],
    center: [52.51, 13.40],
    zoomLevel: 10
});

var mySearch = nokia.places.search.manager;
var myContainer = new nokia.maps.map.Container();

// Process search results, but creating markers and adding them to the
 map:
function onSearchDone(data, status) {
    if (status == "OK") {
```

www.EngineeringBooksPdf.com

```
        for (var i = 0, len = data.results.items.length; i < len; i ++) {
            var place = data.results.items[i];
            var aMarker = new nokia.maps.map.StandardMarker(new
                nokia.maps.geo.Coordinate(
                    place.position.latitude,place.position.longitude
                ),
                {text: i+1}
            );

            // Push marker(s) to the container:
            myContainer.objects.add(aMarker);
        }

        // Zoom to result(s)
        map.zoomTo(myContainer.getBoundingBox());

        // Add container to the map:
        map.objects.add(myContainer);

        // Zoom out if too close
        if (map.zoomLevel > 16) {
                        map.set("zoomLevel", 10);
        }
    }
};

map.addListener("displayready", function () {
    mySearch.findPlaces({
        searchTerm: "pizza",
        boundingBox: map.getViewBounds(),
        onComplete: onSearchDone
    });
});
```

Getting Information about Places

This article uses simple examples to demonstrate how to call functions defined in the namespace `nokia.places.manager` to obtain place-related data.

Please note that the examples in this article do not show how to process the data returned by Places back-end. To process the data, please refer to the documentation for each of the data classes in the API reference for the Places library. You need to define a function that performs the actual processing – it must be provided as the value of the `onComplete` parameter in each function argument object. In in the examples below, this function is shown as a stub.

All examples assume that `placeId` contains the value of an actual id of a place for which data is to be retrieved (or posted).

www.EngineeringBooksPdf.com

Getting Place Data

The function `getPlaceData()` retrieves detailed information about a single place. Its argument is an object that, at a minimum, must identify the place for which to obtain data and provide a function that processes the data:

```
nokia.places.manager.getPlaceData({
    placeId: placeId,
    onComplete: function(data, status){
        // handle/process data
    }
});
```

Getting Place Data in a Different Language

The default language of the Places library is US English denoted by the string 'en-gb' (a combination of the ISO 369 language code and ISO 3166 Alpha 2 country code). If you would like to receive data in a different language, you need to call the method `nokia.places.settings.setLocale()`, passing to it the appropriate language designation, before you submit a request for place-related data. If the language is supported, the back end returns the data in it, otherwise the data arrives in the closest matching language or the default language.

The code below demonstrates how to select Czech as the language for the back-end response.

```
nokia.Settings.set('defaultLanguage', 'cs-cz');
nokia.places.places.manager.getPlaceData({
    placeId: placeId,
    onComplete: function(data, status){
        // handle/process data
    }
});
```

Getting Place Reviews

To obtain only a list of reviews for a particular place, you can use the function call shown below, providing the place id and a callback to handle the retrieved data:

```
nokia.places.places.manager.getReviews({
    placeId: placeId,
    onComplete: function(data, status){
        // handle/process data
    }
});
```

www.EngineeringBooksPdf.com

Getting Images/Media

`getMedia()` is a function that helps you retrieve the contents of the `media` element of a `Place` object. This typically includes images. The functions argument is an object that must include the place id and the callback that is to process the retrieved data:

```
nokia.places.places.manager.getMedia({
    placeId: placeId,
    onComplete: function(data, status){
        // handle/process data
    }
});
```

Posting a New Rating

Finally, you can update a place's ratings by calling `postRating()`. The function argument object must include the place id, a rating value (an integer) and a callback to process the results, which is a rating object containing the calculated rating for a place, for example, `{value:4,count: 120}`.

```
nokia.places.places.manager.postRating({
    placeId: placeId,
    ratingValue: ratingValue,
    onComplete: function(){
        // handle/process data
    }
});
```

node.js Sever-side Scripting

To access the data-only functionality of the Places library when writing node.js scripts, you need to:

1. Download the file `node.js` from the following URL: *http://nodejs.org/* – but if `node.js` is already installed, please go directly to the next step
2. Use the Node Package Manager to install the Places library with the following command:

   ```
   npm install nokiaplaces
   ```

3. Add the following statement to your source code – this ensures that you have access to the Data API functions such as `nokia.places.search.manager.findPlaces` and more:

   ```
   var nokia = require('nokiaplaces');
   ```

4. Provide your authentication/authorization credentials by calling `nokia.places.settings.setAppContext()` – this is required, because in this scenario the complete jsl.js is not loaded (see also *Quick Start* on page 12)

   ```
   nokia.places.settings.setAppContext({
       app_id: 'YOUR_APPID',
   ```

www.EngineeringBooksPdf.com

```
    app_code: 'YOUR_TOKEN'
)}
```

5. Use the Places library's data-only functionality within your `node.js` script

```
nokia.places.search.manager.findPlaces({
    searchTerm: 'pizza',
    searchCenter: {
        latitude: 52.516274,
        longitude: 13.377678
    },
    onComplete: function(data, status){
       console.log(data);
    }
});
```

Please check *Searching for places* and *Getting details of places* for more information about using the Places Data API.

Positioning

The user's location is one of the key pieces of information in building a Web map application. The HERE Maps API for JavaScript supports the use of W3C browser positioning, making it easy for an application to use positioning information.

Precision depends on the positioning technology and ranges from rough IP Positioning (only supported in a few browsers such as Mozilla Firefox), cell positioning (usually available on tablets and notebooks) up to very precise WiFi detection (all WiFi-enabled modern browsers, among them mobile browsers). In addition, The API supports GPS or A-GPS on tablets and smart phones, which delivers very accurate positioning.

Visual presentation of positioning data on the map includes proximity rendering.

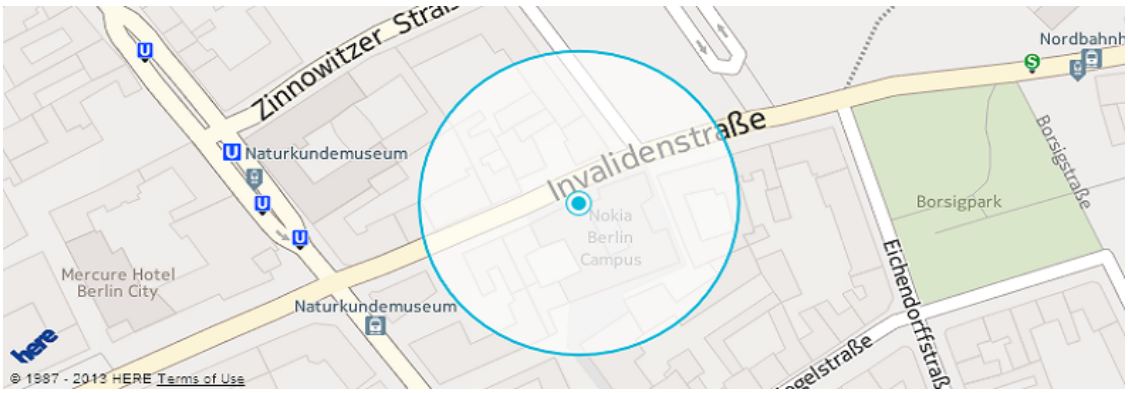
Example

The example below demonstrates the use of W3C geolocation API to obtain positioning information (location) and to display it as a marker on the map. A positioning request is submitted if the application user's mouse hover over the map. On success, a message confirms this and, in addition, the map displays a marker in a circle that reflects the accuracy of the positioning information. On

www.EngineeringBooksPdf.com

failure, the application displays an error message. The image below shows the success scenario, with a marker and the accuracy circle marking the detected location.

Figure 20: Using the W3C geolocation API (only works in browsers that support this functionality)



As in all the previous examples, the code creates an instance of map `Display`, but it also obtains an object representing the positioning `Manager`. It also defines a callback function named `getPos()`, which obtains the current geographic position from the browser and then creates a `StandardMarker` plus the accuracy circle and sets the map zoom level to ensure the entire circle is visible. The callback is associated with the `"mouseover"` event for the HTML element that contains the map.

```
var map = new nokia.maps.map.Display(
    document.getElementById("mapContainer"), {
        components: [new nokia.maps.map.component.Behavior()],
        zoomLevel: 13,
        center: [52.51, 13.4]
});

if (nokia.maps.positioning.Manager) {
    var positioning = new nokia.maps.positioning.Manager();

    // Get the current position. If available, the first callback is run,
    // otherwise the second.
    positioning.getCurrentPosition(
        function (position) {
            var coords = position.coords;
            var marker =
                new nokia.maps.map.StandardMarker(coords);
            var accuracyCircle =
                new nokia.maps.map.Circle(coords, coords.accuracy);
            map.objects.addAll([accuracyCircle, marker]);
            map.zoomTo(accuracyCircle.getBoundingBox(), false, "default");
        },
        // Handle errors (display message):
        function (error) {
            var errorMsg = "Location could not be determined: ";

            // Determine what caused the error and show error message:
            if (error.code == 1)
                errorMsg += "PERMISSION_DENIED";
            else if (error.code == 2)
                errorMsg += "POSITION_UNAVAILABLE";
            else if (error.code == 3)
```

www.EngineeringBooksPdf.com

```
                errorMsg += "TIMEOUT";
            else errorMsg += "UNKNOWN_ERROR";

            alert(errorMsg);
        };
    )
}
```

Event System

The HERE Maps API for JavaScript offers its own standardized event framework to handle user interactions such as mouse clicks and dragging. Because different browsers handle events differently, the framework harmonizes those differences in a way that is compliant with W3C standards and gives the developer an effective tool to process events on native DOM nodes. The framework also offers support for de facto standard events such as touch and gestures in the environments that support them, and it can be extended to apply to native DOM nodes.

All the classes related to the event framework are defined within the `dom` namespace. This includes the `Page` class, which defines an abstraction level for native browser events and is, in fact, the entry point to the functionality offered by the package. The namespace `dom` also includes the helper classes `Event`, `EventTarget` and `DataTransfer`.

The signatures for the event functions, for example those that allow you to add listeners, do not comply strictly to the W3C specifications, but are compatible with other JavaScript frameworks.

The supported events are listed and described in the table below:

Table 9: Events in HERE Maps API for JavaScript

Event	Description
`focus`	Fired if an element receives focus.
`blur`	Fired if an element loses focus.
`mousedown`	Fired if a mouse button has been pressed.
`mouseup`	Fired if a mouse button has been released.
`mousemove`	Fired if the mouse is moved.
`mousewheel`	Fired if the mousewheel is moved.
`click`	Fired after a `mousedown`/`mouseup` or a `touchstart`/`touchend` has occurred without a drag operation having been started. For `touchstart` and `touchend`, the `click` event is simulated if no tap listener is registered or if the tap listener has not prevented the default by using the `preventClick()` method.
`dblclick`	Fired after two `click` events have been fired within a certain time period.
`mouseover`	Fired if the mouse is moved above a new target.

www.EngineeringBooksPdf.com

Event	Description
`mouseout`	Fired if the mouse left a target.
`mouseenter`	Fired if the mouse is moved above a new target.
`mouseleave`	Fired if the mouse leaves the outer bounding box of a target for which a `mouseenter` has been fired.
`dragstart`	Fired at an event target that has the property `"draggable"` set to `true` and after a `mousedown`/`touch` has occurred and the mouse/finger has been moved by at least three pixels. If the event is not canceled, then the drag operation is permitted. The property `"dataTransfer"` can be used to keep track of information while dragging.
`drag`	Fired at the target node of the `dragstart` event while a drag operation is ongoing. The `"relatedTarget"` property contains a reference to the target that is currently under the mouse point or the user's finger tip (only for simulated drag events, not for the native ones).
`dragenter`	Fired at a node if the mouse/finger is moved into the visible area of the element, d uring a drag operation. If the event is canceled, a drop at the target is allowed, otherwise a drop is denied. If the drop is allowed, the target becomes the current drop target.
`dragover`	Fired at the current drop target while the mouse/finger is above the drop target, but only after the `dragenter` event has been canceled. If this event is not canceled, the drop effect is set to `"none"`, which disallows a drop into the drop target.
`dragleave`	Fired at a node, when the mouse/finger has been moved away from it.
`drop`	Fired if the mouse button or finger is released above a valid drop target. It means that the `dragenter` event and the `dragover` event have been canceled and the allowed effect matches the drop effect. If the event is not canceled and the drop target is a text field (for example a text area or an input element), then the content of the "text/plain" format is inserted into this area (either at the cursor position or at the end). Otherwise, the drop effect is set to `"none"`.
`dragend`	Fired at the end of a drag operation at the original `dragstart` target, both if the drop is aborted or failed, or if the drop was successful. The event signalizes the end of a drag operation. The state of the drop operation can be read from the drop effect, which can be `"none"`, `"move"`, `"copy"` or `"link"`.
`touchstart`	Fired as soon as a finger is pushed on a touch screen.
`touchmove`	Fired as soon as a finger is moved above a touch screen.
`touchend`	Fired as soon as a finger is released from a touch screen.
`gesturestart`	Fired as soon as two or more fingers touch the touch screen (high-level event).
`gesturechange`	Fired whenever either of two fingers is moved, changing the properties of the gesture (high-level event).
`gestureend`	Fired as soon as only one finger is left touching the touch screen and as soon as all fingers have been removed from the touch screen. (high-level event).
`tap`	Fired after a `touchstart` and `touchend` have occurred at the same target and only if neither the `touchstart` nor the `touchend` event has been canceled.
`dbltap`	Fired after two tap events have been fired in a certain amount of time.

www.EngineeringBooksPdf.com

Event	Description
`longpress`	Fired after a mouse button or finger has been pressed for a certain amount of time without starting a drag or gesture.

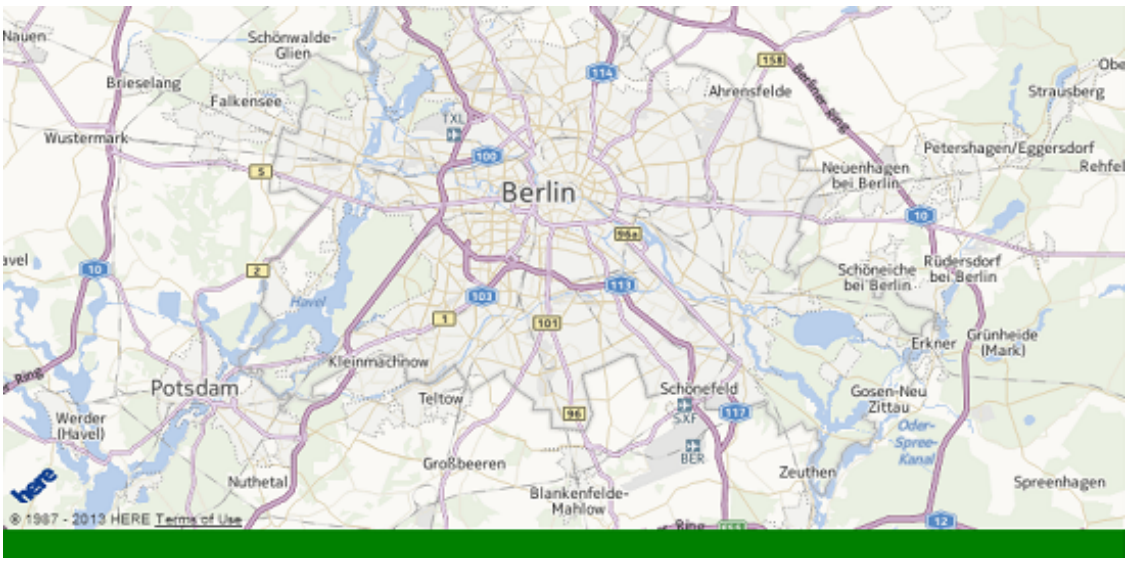
To add support for `Page` events to a DOM node, the `EventTarget` interface must be attached to the DOM node. This can be done by simply casting the node to `EventTarget`. The code implements a simple scenario in which a static map is displayed in one DOM node and a green rectangle underneath it in another. When the user clicks on the green area, the code changes the color to gray and shows an alert to indicate that it has received (and processed) the "click" event.

```
<div id="mapContainer" style="width:785px; height:460px;"></div>
<div id="eventElt" style="background-color: green; width:785px; height:20px;"></div>
<script type="text/javascript">
    var map = new nokia.maps.map.Display(
        document.getElementById("mapContainer"), {
            zoomLevel: 10,
            center: [52.51, 13.4]
    });

    // Create a few shortcuts.
    var Page = nokia.maps.dom.Page,
        EventTarget = nokia.maps.dom.EventTarget,
        eventElt = document.getElementById("eventElt"); // green rect

    // Query Page support for the node.
    Page(eventElt);

    // Attach EventTarget interface to the document node to allow
    // normalized events at the node.
    EventTarget(eventElt);

    // Add a listener for the click event to the node. It changes
    // the background color and shows an alert.
    eventElt.addListener("click", function (evt) {
        eventElt.style.backgroundColor = "#D3D3D3";
        alert( "Event triggered: " + evt.type );

        // Unregister the listener, so that the alert is shown only
        // once.
        eventElt.removeListener("click", arguments.callee, false);
    }, false);
</script>
```

www.EngineeringBooksPdf.com

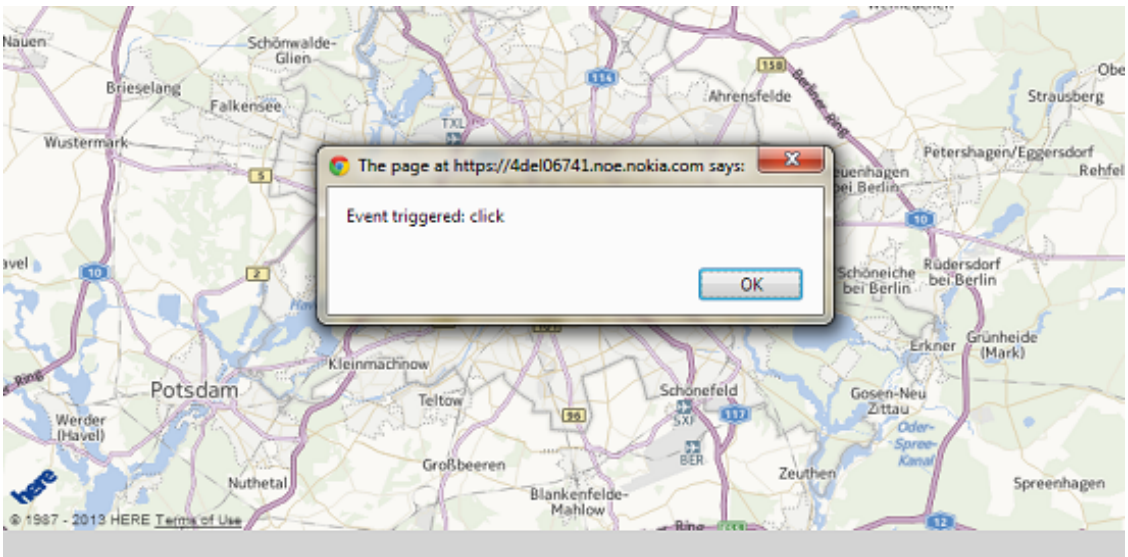
The image below shows the initial view an HTML page including the above code.

Figure 21: A map with a clickable area for the Simple Example for Page events



The picture that follows shows the same page after the user has clicked on the rectangle under the map. The alert reflects the fact that the click event has been processed.

Figure 22: Feedback indicating that the Page event has been processed



www.EngineeringBooksPdf.com

Observers and Mutable Objects

Tracking state changes is a common use case and the Maps API provides an implementation of the *Observer* pattern to address it. It allows you to observe:

- changes of state – for objects derived from `OObject`
- actions – for instances of `OList`

In both cases, you need to call the method `addObserver()` on the object in which you are interested, passing to it a callback function to be invoked when an observable change to the object occurs. In addition, you need to indicate the property or properties to observe on an instance of `OObject`. By contrast, an `OList` observer (callback) is invoked on all and any actions that affect the state of the object, so when adding an `OList` observer, there is no option to specify the actions or properties in which you are interested.

The example below shows how to add an observer on an instance of `map.Display` represented by a variable named `map`. `map.Display` extends `OObject`, therefore the callback receives information about the object's state changes, and specifically about the property named "state" – the callback receives it via the argument `value`.

```
var zoomObserver = function (obj, key, newValue, oldValue) {
    if (newValue > 14) {
        map.set("zoomLevel", oldValue);
    }
};

map.addObserver("zoomLevel", zoomObserver);
```

In this case, the observer is invoked whenever the Display property "zoomLevel" changes. It checks if the new value of the property is higher than 14, and if it is, it makes sure "zoomLevel" reverts to the last known value before the change. In short: it is used to ensure that "zoomLevel" can never be higher than 14.

Mutable Objects

The classes defined in the Maps API distinguish between two types of objects:

- `immutable` – objects whose state should never change once they have been created
- `mutable` – objects that are designed to hold data which may be altered

All `mutable` objects are derived either from `OList` or `OObject` and therefore offer the *Observer* pattern described in (see *Observers and Mutable Objects* on page 95).

www.EngineeringBooksPdf.com

An example of an object that is designed to be `immutable` is an instance of the class `Coordinate` from the namespace `geo`. The class is not designed to support state changes and therefore it does not offer the *Observer* pattern. Although technically JavaScript permits you to alter the internal state of an `immutable` object, bear in mind that this could lead to problems, as there is no mechanism to propagate the state change information to other objects that may depend on it.

Please check the inheritance chain in the documentation to be sure if a class is observable or not.

Multi-language Support

The HEREMaps API for JavaScript supports localization in the following languages:

Table 10: Localization Languages in HEREMaps API for JavaScript

Locale ID	Description	Comment
en-GB	English as spoken in Great Britain	
en-US	English as spoken in the USA	default language
de-DE	German as spoken in Germany	
fr-FR	French as spoken in France	
es-ES	Spanish as spoken in Spain	
it-IT	Italian as spoken in Italy	
ru-RU	Russian as spoken in Russia	
zh-CN	Simplified Chinese	

Please note that the list of supported languages is under constant revision and HERE reserves the right to alter the list without notice.

By default, the language of the maps displayed using this API is defined by the browser's language preferences. You can override this behavior to meet specific requirements by calling the method `set()` on the static class `Settings` before you initialize the map (otherwise the attempt to set the language has no effect). The first argument to `set()` is the name of the property you wish to change, in this case `"defaultLanguage"`. The second argument is the value of the property. The following example sets the default language to German spoken in Germany by calling the method `set()` on the class `Settings`:

```
nokia.Settings.set("defaultLanguage", "de-DE");
var map = new nokia.maps.map.Display(
```

www.EngineeringBooksPdf.com

```
    document.getElementById("mapContainer"),
    {
        components: [
         new nokia.maps.map.component.ZoomBar(),
         new nokia.maps.map.component.TypeSelector()],
        zoomLevel: 2,
        center: [40.83, 28.98]
    }
);
```

Note that if you set the locale to an unsupported language, the API automatically attempts to use the closest supported alternative or the default language for the API ("en-US"). For example, if you set "language" to "fr-BE" (French as spoken in Belgium), the map text is automatically displayed in French as spoken in France ("fr-FR").

www.EngineeringBooksPdf.com

Chapter 4

API reference

Topics:

- *Namespace:*
- *Namespace:*

The following pages offer a complete detailed reference to the namespaces, classes and methods in the Maps API for JavaScript.

www.EngineeringBooksPdf.com

Namespace:

Namespace Summary

This namespace defines classes and namespaces that implement support for templates utilized by *nokia.places.ui*.

Namespace Description

This namespace defines classes and namespaces that implement support for templates utilized by *nokia.places.ui*.

Class: Template

This class is a member of ***jsMotif***.

Class Summary

`jsMotif.Template` is a template rendering class.

[*For full details, see jsMotif.Template*]

Table 11: Method Summary

Methods
addEvent `(rel, name, handler)` This method adds an event handler to a template element.
addEventMap `(events)` This method adds an event map to the template.
fetch `(jsonObject) : {String}` This method renders the received data using the HTML template and returns the result as an HTML string.
getRelMap `(node)` This method obtains a map object relating the `rel` attributes and the DOM elements to which they apply within the caller-supplied DOM node.
registerAttr `(name, handler)` This method registers a handler for an attribute in a template DOM node.

www.EngineeringBooksPdf.com

Methods
render `(jsonObject, targetElem, append)`
This method renders the HTML template, using the data and the target element specified by the caller.

Class Description

`jsMotif.Template` is a template rendering class. It is extended by *nokia.places.ui.Template*.

Constructor Details

`jsMotif.Template(params)`

This method creates an instance of the class.

Parameters:

`params`: `{Object}`

An initialization object with the following properties

- `template` - (mandatory) a value which represents a template it can be:
  - a {String} containing HTML elements, e.g. ' <a></xref> '
  - a {String} containing an existing DOM element id (the template pattern is extracted from the DOM node
  - a {Object} reference to existing DOM node in JavaScript
- `targetNode` - the element into which the template is to be rendered; its value can be:
  - a {String} which represents an existing element id
  - an {Object} which represents a reference to an existing DOM element in JavaScript
- `functions` - an object/hash map which contains a user-defined function that may be used to render or to affect rendering of the element in template.
- `event` - an array of objects which specify the events attached to template nodes and the event handlers; each object in the array has the following attributes:
  - `rel` - a {String} indicating the template node to which to attach the event

www.EngineeringBooksPdf.com

- name - a {String} providing the name of the attached event; the supported event names are 'keydown', 'keyup', 'keypress', 'click', 'dblclick', 'mousedown', 'mousemove', 'mouseout', 'mouseover', 'mouseup', 'mouseenter', 'mouseleave', 'blur', 'change', 'focus', 'reset', 'select', 'submit', 'abort'
- handler - a caller-defined {Function} to be invoked when the user triggers the attached event; the function receives the data object as an argument and 'this' within the function refers to the element on which the event was triggered

Method Details

addEvent(rel, name, handler)

This method adds an event handler to a template element.

Parameters:

rel:	{String}
	The value of the rel attribute in the template node
name:	{String}
	The name of the event, for example 'click', 'mouseout', etc.
handler:	{Function}
	An event handler function defined by the caller

addEventMap(events)

This method adds an event map to the template.

Parameters:

events:	{Object}
	An array object assigning events and event handlers to a template node (see also the parameter event in the class constructor)

www.EngineeringBooksPdf.com

`fetch(jsonObject): {String}`

This method renders the received data using the HTML template and returns the result as an HTML string. No events are attached.

Parameters:

`jsonObject`:	`{Object}`
	An object containing the data to be rendered

Returns:

`{String}`	An HTML string into which the received data have been rendered

`getRelMap(node)`

This method obtains a map object relating the `rel` attributes and the DOM elements to which they apply within the caller-supplied DOM node.

Parameters:

`node`:	`{HTMLElement}`
	The DOM element in the template; all children of this element are checked for the `rel` attribute

Returns:

	An {Object} mapping the `rel` attributes and DOM elements

`registerAttr(name, handler)`

This method registers a handler for an attribute in a template DOM node.

Parameters:

`name`:	`{String}`
	The name of the attribute as a string
`handler`:	`{Function}`
	A caller-defined attribute handler function

www.EngineeringBooksPdf.com

render(jsonObject, targetElem, append)

This method renders the HTML template, using the data and the target element specified by the caller.

Parameters:

jsonObject:	{Object}
	An object containing the data to be rendered
targetElem:	{HTMLElement}
	An optional target element in which to render the data; it is specified as {String) containing the DOM id or a node reference
append:	{Boolean}
	An flag which tells if the template should append rendered element to target Node without clearing the node content

Namespace: selector

This namespace is a member of ***jsMotif***.

Namespace Summary

This namespace defines a selector for JSON objects, which is a simplified XPath for safe JSON object data selection.

Table 12: Method Summary

Methods
getData (path, defaultValue) This function retrieves data from a JSON object, using the provided path.
resolveCondition (selector) This function resolves a conditional path.

www.EngineeringBooksPdf.com

Namespace Description

This namespace defines a selector for JSON objects, which is a simplified XPath for safe JSON object data selection. The functions in this namespace are used within *jsMotif.Template*.

Method Details

`getData``(path, defaultValue)`

This function retrieves data from a JSON object, using the provided path.

Parameters:

`path:`	`{String}`	The path to data within the JSON object; may contain array selectors
`defaultValue:`	`{Object}`	The default value to return when the path finds nothing

Example:

```
getData.call(jsonObject,'path1.path2[3]','default text');
```

`resolveCondition``(selector)`

This function resolves a conditional path.

Parameters:

`selector:`	`{String}`	A selector or a conditional path

Returns:

Boolean value indicating if the condition is met

Example:

```
resolveCondition.call(jsonObj,'path1.inner1');
resolveCondition.call(jsonObj,'path1.inner2=="some text");
```

www.EngineeringBooksPdf.com

Namespace:

Namespace Summary

`jsMotif.Template` is a template rendering class.

Class: Features

This class is a member of ***nokia***.

Class Summary

This class provides facilities that allow you to register and load individual functional components (features) of the API.

[*For full details, see nokia.Features*]

Table 13: Method Summary

Methods
`static` ***add*** `(featureName, featureImplName, loadPath, detector, dependencies, overrides, charset)` This method adds a new feature implementation definition to the feature registry.
`static` ***get*** `(featureName, featureImplName)` This method retrieves a feature implementation definition object for the feature specified by the caller.
`static` ***getFeatureMap*** `()` This method retrieves a map object containing the names of available implementations for each registered feature.
`static` ***getLoadedMap*** `()` This method retrieves a map of the names of fully loaded implementations for each registered feature.
`static` ***isLoaded*** `(featureName, featureImplName) : {Boolean}` This method checks whether a certain feature implementation has been successfully loaded.
`static` ***load*** `(requested, onSuccess, onError, doc=document, sync)` This method loads a set of features specified by the caller.

www.EngineeringBooksPdf.com

Class Description

This class provides facilities that allow you to register and load individual functional components (features) of the API. It automatically resolves dependencies between features and provides mechanisms to detect the best feature implementation for the current environment. A feature may exist in different implementations for different target environments. A feature implementation is a set of classes that provide certain functionality and can be loaded to enrich the functionality set accessible through the API. The features that can be loaded individually with the help of the methods on this class include such components as "routing" and "search".

By default, the API loads package named "all" (see section "Packages and Detection" in User Guide) which contains features in optimal implementation for the environment in which it runs. However, the loading of packages may be deferred at page-load time. This may reduce the initial page load time by limiting the amount of API code that is transferred and executed before the page contents are fully displayed. To do that loader file `jsl.js` must be called with `blank=true` GET parameter (ex. <script src="http://js.api.here.com/se/2.5.4/jsl.js?blank=true" type="text/javascript"></script>).

`Features` is a static object that cannot be instantiated, therefore to call one of its methods, you must precede the method name with the namespace and the name of the class, using the dot notation. For example, in case of deferred loading you can call the `load()` method as follows:

```
var featureMap = nokia.Features.getFeaturesFromMatrix(["maps"]); //that will
 return all features that are included in "maps" package
nokia.Features.load(featureMap, successCallback, errorCallback, document,
 false); //loads asynchronously all necessary files and
  //invokes successCallback where map instantiation etc. can take place
```

Method Details

`static` **`add`**`(featureName, featureImplName, loadPath, detector, dependencies, overrides, charset)`

This method adds a new feature implementation definition to the feature registry. If the feature does not yet exist in the registry, an entry for it is created, including the feature name and the implementation and the implementation object.

Parameters:

`featureName`:	`{string}`
	A canonical name of the feature which the implementation provides
`featureImplName`:	`{string}`

www.EngineeringBooksPdf.com

A canonical the name of the implementation

`loadPath`: `{string}`

The load path of the implementation file

`detector`: `{function ()}` [optional]

The detector function that determines whether this feature can be loaded in the current environment; if a detector is not provided, a default function that always returns `true` is used

`dependencies`: `{Array}` [optional, default: null]

An optional array of the names of the features on which the named implementation depends

`overrides`: `{Array}` [optional, default: null]

An optional array of implementation names (within the same feature) this implementation overrides.

`charset`: `{string}` [optional, default: 'utf-8']

An optional identifier of the character set for the script

```
static  get(featureName, featureImplName)
```

This method retrieves a feature implementation definition object for the feature specified by the caller.

Parameters:

`featureName`: `{string}`

The name of the feature to be retrieved

`featureImplName`: `{string}` [optional, default: 'auto']

Either the name of the specific implementation or 'auto', which allows the method automatically to detect the optimal implementation for the current environment

www.EngineeringBooksPdf.com

Returns:

A feature implementation object, or `null` if the feature is not supported by the current environment

`static` **`getFeatureMap()`**

This method retrieves a map object containing the names of available implementations for each registered feature. The map has the following structure:

```
  {
  featureA: [featureImplNameA1, featureImplNameA2, ...],
  featureB: [featureImplNameB1, ...]
  ...
}
```

Returns:

A map object listing registered feature implmentations

`static` **`getLoadedMap()`**

This method retrieves a map of the names of fully loaded implementations for each registered feature. The returned map has the following structure:

```
  {
  featureA: [featureImplNameA1, featureImplNameA2, ...],
  featureB: [featureImplNameB1, ...]
  ...
  }
```

Returns:

A map object listing loaded implementations of registered features

`static` **`isLoaded(featureName, featureImplName): {Boolean}`**

This method checks whether a certain feature implementation has been successfully loaded. The method returns `true` if the queried implementation has been successfully loaded (i.e. transmitted AND evaluated). The method throws an exception when either the feature or the implementation is unknown.

www.EngineeringBooksPdf.com

Parameters:

`featureName:` `{Object}`

The name of the feature to check

`featureImplName:` `{Object}`

- the name of the implementation of the feature to check

Returns:

`{Boolean}` `true` if the feature has been fully loaded, `false` otherwise

`static` **`load`**`(requested, onSuccess, onError, doc=document, sync)`

This method loads a set of features specified by the caller. The caller can provide optional callbacks to be invoked on success and on error and also a target document to which the respective script tags should be appended. The caller specifies the features to load in a hash object, where the keys represent the feature names and the values provide the implementation parameters, for example:

```
nokia.Features.load({
 "map": "auto",
 "search": "auto"
});
```

Parameters:

`requested:` `{Object}`

A hash containing the names of the features to load (as keys) and feature implementation parameters (as values)

`onSuccess:` `{function ()}`

A function to be called on success

`onError:` `{function (e)}`

A function to be called on error

`doc=document:` `{Document}`

The host document

www.EngineeringBooksPdf.com

sync: {Boolean}

A Booleand indicating whether synchronous loading via document.write is to be enforced (`true`) or not (`false`)

Class: Settings

This class is a member of ***nokia***.

Class Summary

This is an observable static class that encapsulates API settings.

[*For full details, see nokia.Settings*]

Table 14: Property Summary

Properties
`static` ***app_code***: {String} This property holds a string token which authenticates the requested application or Web page.
`static` ***app_id***: {String} This property holds an id which authenticates the requested application or Web page.
~~`static` ***appId***: {String}~~ This property holds an id which authenticates the requested application or Web page.
~~`static` ***authenticationToken***: {String}~~ This property holds a string token which authenticates the requested application or Web page.
`static` ***defaultLanguage***: {String} This property holds the default language used by all service managers.
`static` ***serviceMode***: {String} This property defines whether the API should send service requests to production URLs or URLs for demo purposes, customer integration testing, etc.

Table 15: Method Summary

Methods
`static` ***addObserver*** (name, callback, context) This method registers an observer for the property named by the caller.

www.EngineeringBooksPdf.com

Methods
`static` ***removeObserver*** `(name, callback, context)`
This method unregisters a previously registered observer for the property named by the caller.
`static` ***set*** `(name, value, force)`
This method sets properties, using the property names and values supplied by the caller.

Class Description

This is an observable static class that encapsulates API settings. It stores API-wide data such as `defaultLanguage`, `appId`, and `authenticationToken`. Properties of the class must be set via the method `set()`, rather than directly.

Example:

```
nokia.Settings.set("defaultLanguage", "en-GB");
nokia.Settings.set("app_id", "YOUR_APPID");
nokia.Settings.set("app_code", "YOUR_APPCODE");
```

Property Details

`static` **`app_code`**`: {String}`

This property holds a string token which authenticates the requested application or Web page. The third-party offering comes with an in-built token, limited to a certain amount of requests per day. The property must be set via the method `set()`.

`static` **`app_id`**`: {String}`

This property holds an id which authenticates the requested application or Web page. The third-party offering comes with an inbuilt id, limited to a certain amount of requests per day. The property must be set via the method `set()`.

~~`static` **`appId`**`: {String}`~~

This property holds an id which authenticates the requested application or Web page. The third-party offering comes with an inbuilt id, limited to a certain amount of requests per day. The property must be set via the method `set()`.

Deprecated: This property is deprecated, please use `app_id`.

www.EngineeringBooksPdf.com

~~static authenticationToken: {String}~~

This property holds a string token which authenticates the requested application or Web page. The third-party offering comes with an in-built token, limited to a certain amount of requests per day. The property must be set via the method `set()`.

Deprecated: This property is deprecated, please use `app_code`.

`static` **`defaultLanguage`**`: {String}`

This property holds the default language used by all service managers. The value must be a string combining an ISO639-1 language code and the appropriate ISO3166-1 alpha-2 country code, for example, "en-US". The property must be set via the method `set()`.

`static` **`serviceMode`**`: {String}`

This property defines whether the API should send service requests to production URLs or URLs for demo purposes, customer integration testing, etc. The following values are possible:

- `undefined` - Indicates that the API will send requests to default production URLs. This is the default value.
- `"cit"` - Indicates that the API will send requests to URLs for customer integration testing

Default Value: `undefined`

Method Details

`static` **`addObserver`**`(name, callback, context)`

This method registers an observer for the property named by the caller.

Parameters:

`name`: `{String}`

The name of the property to observe

`callback`: `{Function}`

The function to be called if the observed property is modified; the function must be able to receive the following arguments:

www.EngineeringBooksPdf.com

- (Variant) value - the new value that the property should be set to

`context:` `{Object}` [optional]

The context in which the given function should be called (default `null`)

`static` **`removeObserver`**`(name, callback, context)`

This method unregisters a previously registered observer for the property named by the caller.

Parameters:

`name:` `{Object}`

The name of the property that is no longer to be observers (the observer for this property is to be removed)

`callback:` `{Object}`

The observer function to remove

`context:` `{Object}` [optional]

The context objects that was received along with the observer function when the observer was registered or none if the observer was registered without a context

`static` **`set`**`(name, value, force)`

This method sets properties, using the property names and values supplied by the caller.

Parameters:

`name:` `{String}`

The name of the property to be set

`value:` `{Variant}`

The value that should be applied to the property

`force:` `{Boolean}`

www.EngineeringBooksPdf.com

this will force notifying observers even if value is the same

Namespace: maps

This namespace is a member of ***nokia***.

Namespace Summary

This namespace contains the implementation classes of Nokia's Maps API.

Namespace Description

This namespace contains the implementation classes of Nokia's Maps API.

Namespace: clustering

This namespace is a member of ***nokia.maps***.

Namespace Summary

This namespace contains resources that allow the API user to cluster markers.

Namespace Description

This namespace contains resources that allow the API user to cluster markers. So areas with high density of markers can be easily displayed on the map. As a result objects are grouped into "islands", aka clusters From that cluster only one single spacial object is shown as a presentation of that cluster. Namespace also provides some useful classes by using which it's very easy to customize presentation of the cluster.

Class: Cluster

This class is a member of ***nokia.maps.clustering***.

Class Summary

This class represents a cluster of markers on the map.

[*For full details, see nokia.maps.clustering.Cluster*]

www.EngineeringBooksPdf.com

Table 16: Method Summary

Methods
getBounds `(dataPoints) : {`*nokia.maps.geo.BoundingBox*`}` This method retrieves an instance of *nokia.maps.geo.BoundingBox* representing the smallest bounding box that encloses all the data points in the cluster.
getIcon `(theme, resetTheMarker)` This method retrieves the icon that represents the given cluster.
getPoints `() : {`*nokia.maps.clustering.IClusterPoint*`[]}` This method retrieves the data points that make up the given cluster.
getSize `() : {Number}` This method retrieves the count of the data points in the given cluster.

Class Description

This class represents a marker cluster on the map. It contains references to all the data points that make up the cluster and provides methods to manage them.

Constructor Details

`nokia.maps.clustering.Cluster(point, opt)`

This method creates an instance of `Cluster`.

Parameters:

`point`:	{*nokia.maps.clustering.IClusterPoint*} [optional] Seed (or the first data point) of the cluster; further data points can be added to the cluster.
`opt`:	{`nokia.maps.clustering.IGridOptions`} [optional] Configuration options for cluster in case if grid based clustering is used

Method Details

`getBounds(dataPoints): {`*nokia.maps.geo.BoundingBox*`}`

This method retrieves an instance of *nokia.maps.geo.BoundingBox* representing the smallest bounding box that encloses all the data points in the cluster.

www.EngineeringBooksPdf.com

Parameters:

`dataPoints`: {*nokia.maps.clustering.IClusterPoint*[]}

A collection of objects representing the data points in the cluster

Returns:

{*nokia.maps.geo.BoundingBox*}

The smallest bounding box that encloses all the data points inside the cluster

`getIcon(theme, resetTheMarker)`

This method retrieves the icon that represents the given cluster.

Parameters:

`theme`: {*nokia.maps.clustering.ITheme*}

The theme to use to representing the cluster on the map

`resetTheMarker`: {`Boolean`} [optional]

A flag indicating whether the marker icon is to be updated (`true`) or whether the cached icon is to be retrieved (`false`; this argument can be used, for example, when modifying theme of existing clusters

`getPoints(): {nokia.maps.clustering.IClusterPoint[]}`

This method retrieves the data points that make up the given cluster.

Returns:

{*nokia.maps.clustering.IClusterPoint*[]}

An array of data points that make up the given cluster

`getSize(): {Number}`

This method retrieves the count of the data points in the given cluster.

www.EngineeringBooksPdf.com

Returns:

{Number}	The number of data points in the given cluster

Class: ClusterProvider

This class is a member of ***nokia.maps.clustering***.

Extends: *nokia.maps.map.provider.Provider*, *nokia.maps.util.OObject*

Class Summary

This class works on a set of data points (locations) and organizes them into clusters to optimize their display on the map.

[*For full details, see nokia.maps.clustering.ClusterProvider*]

Table 17: Property Summary

Properties
static ***STATE_CLUSTERED***: {String} This constant indicates a state which an instance of ClusterProvider enters when it has completed clustering and rendering of the markers on the map can begin (is about to begin).
static ***STATE_INITIAL***: {String} This constant identifies the initial state of an instance of this class after the instance has been created, or after invocation of *nokia.maps.clustering.ClusterProvider#clean* and *nokia.maps.clustering.ClusterProvider#invalidate* methods.
static ***STATE_READY***: {String} This constant indicates a state which an instance of ClusterProvider enters when it has determined clusters and noise points and their representation for display on the map.
static ***STATE_STARTED***: {String} This constant indicates a state which an instance of ClusterProvider enters when clustering has started.
static ***STRATEGY_DENSITY_BASED***: {Number} This constant indicates that density based clustering strategy should be used.
static ***STRATEGY_GRID_BASED***: {Number} This constant indicates that grid based clustering strategy should be used.

Directly Inherited Properties

Inherited from class *nokia.maps.map.provider.Provider* :

description, *getInvalidationMark*, *id*, *label*, *max*, *min*

www.EngineeringBooksPdf.com

Table 18: Method Summary

Methods
add `(dataPoint)` This method adds a data point to the list of data points to be considered for clustering.
addAll `(dataPoints, callback)` This method adds a list of data points to the list of objects for clustering.
clean `()` This method removes clusters and noise points from display.
cluster `()` This method starts the clustering process.
destroy `()` This method cleans up all internal objects and prepares the given instance of this class to be destroyed.
getContainer `() : {nokia.maps.map.Container}` Returns instance of *nokia.maps.map.Container* which holds presentations for all clusters and noise points.
getDataLength `() : {Number}` This method retrieves a numeric value indicating the number of data points in the data set available to the given instance of the class.
getEps `() : {Number}` This method retrieves the current epsilon value, which represents the area within which data points are considered for clustering.
getMinPts `() : {Number}` This method retrieves a value indicating the smallest number of points within the epsilon "radius" that are required to form a cluster.
invalidate `()` This method invalidates the current results of clustering and sets the state to `nokia.maps.clustering.ClusterProvider.STATE_INITIAL`.
numberOfClusters `() : {Number}` This method retrieves the number of clusters in the data set available to the given instance of the class.
numberOfNoisePoints `() : {Number}` This method retrieves a numeric value indicating the number of noise points in the data set available to the given instance of this class.
remove `(dataPoint)`

www.EngineeringBooksPdf.com

Methods
This method removes a data point from the list of objects to be considered for clustering.
setEps `(epsilon)` This method sets a new epsilon value (in pixels), which represents the area within which data points are considered for clustering.
setMinPts `(minPts)` This method sets a new value indicating the smallest number of points within the epsilon "radius" that are required to form a cluster.
setTheme `(theme)` This method sets the theme to use while rendering clusters on the map.

Directly Inherited Methods

Inherited from class *nokia.maps.map.provider.Provider* :

getCopyrights, *providesLevel*, *shutdown*, *update*

Inherited from class *nokia.maps.util.EventTarget* :

addListener, *dispatch*, *removeListener*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Event Summary

Directly Inherited Events

Inherited from class *nokia.maps.map.provider.Provider* :

response, *update*

Class Description

Class is a implementation of map Provider and visualize a given data as cluster.

Constructor Details

`nokia.maps.clustering.ClusterProvider``(display, options)`

This method creates new instance of `ClusterProvider`.

Parameters:

www.EngineeringBooksPdf.com

display:	{*nokia.maps.map.Display*} Display The object on which markers are to be drawn
options:	{*nokia.maps.clustering.ClusterProvider.Options*} [optional] An object specifying the configuration settings for the clustering provider instance

Property Details

`static` **`STATE_CLUSTERED`**: {String}

This constant indicates a state which an instance of `ClusterProvider` enters when it has completed clustering and rendering of the markers on the map can begin (is about to begin). Please note that, because clustering may be repeated on every zoom level change, this state might be set multiple times.

`static` **`STATE_INITIAL`**: {String}

This constant identifies the initial state of an instance of this class after the instance has been created, or after invocation of *nokia.maps.clustering.ClusterProvider#clean* and *nokia.maps.clustering.ClusterProvider#invalidate* methods.

`static` **`STATE_READY`**: {String}

This constant indicates a state which an instance of `ClusterProvider` enters when it has determined clusters and noise points and their representation for display on the map. Note that when this state is set, clusters and noise points may not be visible on the map yet. The rendering engine needs some additional time to draw them on the map.

`static` **`STATE_STARTED`**: {String}

This constant indicates a state which an instance of `ClusterProvider` enters when clustering has started. Please note that, because clustering may be repeated on every zoom level change, this state might be set multiple times.

`static` **`STRATEGY_DENSITY_BASED`**: {Number}

This constant indicates that density based clustering strategy should be used.

www.EngineeringBooksPdf.com

`static` **`STRATEGY_GRID_BASED`**`: {Number}`

This constant indicates that grid based clustering strategy should be used.

Method Details

`add``(dataPoint)`

This method adds a data point to the list of data points to be considered for clustering. Note that the method does not perform input validation to boost performance, therefore the caller must ensure that the object passed to the method contains the properties "latitude" and "longitude".

Parameters:

`dataPoint:`	`{`*`nokia.maps.clustering.IClusterPoint`*`}` An object containing the latitude and longitude of a location; it may additionally contain the property "value" if you wish to position the cluster marker according to the "weight" center of the cluster (see also *nokia.maps.clustering.IClusterPoint*).

`addAll``(dataPoints, callback)`

This method adds a list of data points to the list of objects for clustering.

Note that to ensure optimal performance, it is best to invoke the method *nokia.maps.clustering.ClusterProvider#cluster* after all the data have been added. Otherwise, as in database systems, addition of new data points means that indices may have to be modified, which incurs a performance penalty.

Parameters:

`dataPoints:`	`{`*`nokia.maps.clustering.IClusterPoint`*`[]}` A collection of data points represented by objects containing latitude and longitude; each point may additionally contain the property "value" if you wish to position the cluster marker according to the "weight" center of the cluster (see also *nokia.maps.clustering.IClusterPoint*).
`callback:`	`{Function}` [optional]

www.EngineeringBooksPdf.com

A callback function to be invoked when all data points (see `dataPoints` above) have been added to the list of items to be considered for clustering

`clean()`

This method removes clusters and noise points from display. It removes all the data points and sets the class state to `nokia.maps.clustering.ClusterProvider.STATE_INITIAL`.

`cluster()`

This method starts the clustering process. Note that the process is asynchronous, therefore to receive notification of its completion, you need to attach an observer to the instance of this class, using the method *nokia.maps.util.OObject#addObserver*. The observer function must be triggered when the `ClusterProvider` state changes to `nokia.maps.clustering.ClusterProvider.STATE_CLUSTERED`.

```
var ClusterProvider = nokia.maps.clustering.ClusterProvider;
clusterProvider = new ClusterProvider(map, {
  dataPoints: [PASS YOUR DATA POINTS HERE]
});
clusterProvider.addObserver("state", function (obj, key, state, oldValue) {
  if (state == ClusterProvider.STATE_CLUSTERED) {
   console.log("Clustering is done!");
  }
});
clusterProvider.cluster();
```

`destroy()`

This method cleans up all internal objects and prepares the given instance of this class to be destroyed.

`getContainer(): {nokia.maps.map.Container}`

Returns instance of *nokia.maps.map.Container* which holds presentations for all clusters and noise points. You can use this method when planning to do for example an event delegation or for attaching common event handlers.

Returns:

www.EngineeringBooksPdf.com

{*nokia.maps.map.Container*}

A value representing the number of data points

getDataLength(): {Number}

This method retrieves a numeric value indicating the number of data points in the data set available to the given instance of the class.

Returns:

{Number} A value representing the number of data points

getEps(): {Number}

This method retrieves the current epsilon value, which represents the area within which data points are considered for clustering.

Returns:

{Number} The current epsilon value

getMinPts(): {Number}

This method retrieves a value indicating the smallest number of points within the epsilon "radius" that are required to form a cluster.

Returns:

{Number} The current value of minimum points

invalidate()

This method invalidates the current results of clustering and sets the state to `nokia.maps.clustering.ClusterProvider.STATE_INITIAL`. Note that the method does not remove objects from the display: in order to do that, please use the *nokia.maps.clustering.ClusterProvider#clean*.

numberOfClusters(): {Number}

www.EngineeringBooksPdf.com

This method retrieves the number of clusters in the data set available to the given instance of the class.

Returns:

`{Number}` A value representing the number of clusters

Throws:

A run-time error if *nokia.maps.clustering.ClusterProvider#cluster* method has not been called (no clusters have been determined).

`numberOfNoisePoints(): {Number}`

This method retrieves a numeric value indicating the number of noise points in the data set available to the given instance of this class.

Returns:

`{Number}` A value indicating the number of noise points

Throws:

A run-time error if *nokia.maps.clustering.ClusterProvider#cluster* method has not been called (no noise points have been determined)

`remove(dataPoint)`

This method removes a data point from the list of objects to be considered for clustering.

Parameters:

`dataPoint`: `{nokia.maps.clustering.IClusterProvider}`

An object containing latitude and longitude (a data point) to be removed from the list of objects to be considered for clustering

Throws:

If indexing is enabled, the method throws a run-time error exception as described for *nokia.maps.clustering.Index#remove*

www.EngineeringBooksPdf.com

`setEps(epsilon)`

This method sets a new epsilon value (in pixels), which represents the area within which data points are considered for clustering.

Note that clusters should be recalculated when the epsilon value changes. Please call the method *nokia.maps.clustering.ClusterProvider#cluster* explicitly to force a recalculation.

Parameters:

`epsilon`: `{Number}`

A new epsilon value; it should be a value no smaller than 10

`setMinPts(minPts)`

This method sets a new value indicating the smallest number of points within the epsilon "radius" that are required to form a cluster. Note that clusters should be recalculated whenever this method has been called. Please call the method *nokia.maps.clustering.ClusterProvider#cluster* explicitly to force a recalculation.

Parameters:

`minPts`: `{Number}`

A value indicating the largest number of data points within the epsilon "radius" that can exist as individual noise points (that are not subject to clustering); the value must be no smaller than 1

`setTheme(theme)`

This method sets the theme to use while rendering clusters on the map. Please note, that theme modification triggers the `cluster()` method.

Parameters:

`theme`: {*`nokia.maps.clustering.ITheme`*}

An object representing the new theme to use

Throws:

www.EngineeringBooksPdf.com

A run-time error if the theme object does not conform to the interface *nokia.maps.clustering.ITheme*

Interface: Options

This interface is a member of ***nokia.maps.clustering.ClusterProvider***.

Interface Summary

This interface defines the configuration options for *nokia.maps.clustering.ClusterProvider*

[*For full details, see nokia.maps.clustering.ClusterProvider.Options*]

Table 19: Property Summary

Properties
dataPoints: {*nokia.maps.clustering.IClusterPoint*[]} This property holds a collection of objects representing data points.
eps: {Number} This property holds the "radius" (in pixels) within which data points are considered for clustering.
index: {*nokia.maps.clustering.Index*} This property holds an indexing data structure to use along with the clustering data.
max: {Number} This property holds a value of the maximum zoom level at which to perform clustering.
min: {Number} This property holds a value of the minimum zoom level at which to perform clustering.
minPts: {Number} This property holds the smallest number of points that must be present within the eps distance of an arbitrary point to form a cluster.
strategy: {Number} This property specifies strategy to use during clustering.
theme: {*nokia.maps.clustering.ITheme*} This property holds an object that represents the display theme for clusters and noise points.

Interface Description

This interface defines the configuration options for *nokia.maps.clustering.ClusterProvider*

www.EngineeringBooksPdf.com

Property Details

dataPoints: {*nokia.maps.clustering.IClusterPoint*[]}

This property holds a collection of objects representing data points. Each object contains the latitude and longitude of a location, but may also include the property `value` for weight-based positioning of the cluster markers - see also *nokia.maps.clustering.IClusterPoint* for further information.

eps: {Number}

This property holds the "radius" (in pixels) within which data points are considered for clustering. If a sufficient number of data points are found within this "radius" from an arbitrary point, a new cluster is created, otherwise any data points within this "radius" become noise points (individual, unclustered markers).

Note that setting this property to a very low value may result in too many points classified as noise points instead of being aggregated in a cluster. Larger values can help resolve this problem, however, they may also produce bigger clusters than desired/expected.

Please note, that due to certain technical details, eps "radius" is approximate and is not pixel precise. In all classes inside `nokia.maps.clustering` package where we refer to eps or eps neighborhood of the given point, we assume a rectangular area with `2*eps` sides and with that given point as a center.

Default Value: `50`

index: {*nokia.maps.clustering.Index*}

This property holds an indexing data structure to use along with the clustering data. It can lead to a significant improvement in the speed of marker data retrieval operations. If this property is not set, `ClusterProvider` uses an instance of *nokia.maps.clustering.Index* with the default *nokia.maps.clustering.RTreeConfiguration*.

Default Value: `nokia.maps.clustering.Index`

max: {Number}

This property holds a value of the maximum zoom level at which to perform clustering.

Default Value: `20`

www.EngineeringBooksPdf.com

min: {Number}

This property holds a value of the minimum zoom level at which to perform clustering.

Default Value: 0

minPts: {Number}

This property holds the smallest number of points that must be present within the eps distance of an arbitrary point to form a cluster. In other words every cluster should contain minimum minPts+1 points.

Default Value: 1

strategy: {Number}

This property specifies strategy to use during clustering. Possible values are:

- nokia.maps.clustering.ClusterProvider.STRATEGY_DENSITY_BASED
- nokia.maps.clustering.ClusterProvider.STRATEGY_GRID_BASED

Default Value: nokia.maps.clustering.ClusterProvider.STRATEGY_DENSITY_BASED

theme: {*nokia.maps.clustering.ITheme*}

This property holds an object that represents the display theme for clusters and noise points. By default, ClusterProvider uses an instance of *nokia.maps.clustering.MarkerTheme*. It creates an SVG marker for each cluster. The marker displays a number reflecting the number of data points in the cluster. The size and color of the marker depends on that number as well.

Default Value: nokia.maps.clustering.MarkerTheme

Class: ColorizerTheme

This class is a member of ***nokia.maps.clustering***.

www.EngineeringBooksPdf.com

Class Summary

An instance of this class provides a colored representation for cluster and noise point markers on the map

[*For full details, see nokia.maps.clustering.ColorizerTheme*]

Table 20: Method Summary

Methods
getClusterPresentation `(data) : {nokia.maps.map.Container}` This method retrieves a container with markers corresponding to all the data points in a cluster (all the markers are set to have the same color).
getNoisePresentation `(dataPoint) : {nokia.maps.map.StandardMarker}` This method retrieves a standard marker representing a noise point.

Class Description

Class provides a colored representation of cluster and noise points. This means that all markers in a cluster have the same color, but the color is different from cluster to cluster, all the data points share the same color, which is different from the cluster marker color. Note that noise points on the map are presented in the same way as standard markers, with light gray color. The class conforms to the interface *nokia.maps.clustering.ITheme*.

Constructor Details

`nokia.maps.clustering.ColorizerTheme()`

This method creates an instance of `ColorizerTheme`.

Method Details

`getClusterPresentation(data): {nokia.maps.map.Container}`

This method retrieves a container with markers corresponding to all the data points in a cluster (all the markers are set to have the same color).

Parameters:

`data:`	`{nokia.maps.clustering.IClusterPoint[] | nokia.maps.clustering.Cluster}`

www.EngineeringBooksPdf.com

A collection of objects representing data points or an instance of *nokia.maps.clustering.Cluster* class

Returns:

{*nokia.maps.map.Container*}

A container holding markers corresponding to all the data points in a cluster

getNoisePresentation(dataPoint): {*nokia.maps.map.StandardMarker*}

This method retrieves a standard marker representing a noise point.

Parameters:

dataPoint: {*nokia.maps.clustering.IClusterPoint*}

An object representing a data point (contains latitude, longitude and optionally weight)

Returns:

{*nokia.maps.map.StandardMarker*}

A standard marker positioned at the coordinates of the data point provided by the caller

Interface: IClusterPoint

This interface is a member of ***nokia.maps.clustering***.

Interface Summary

This interface defines properties for a data point that can be used in clustering.

[*For full details, see nokia.maps.clustering.IClusterPoint*]

Table 21: Property Summary

Properties
value: {Number} This property holds a numeric value that indicates the "weight" of the the data point within the cluster.

www.EngineeringBooksPdf.com

Directly Inherited Properties

Inherited from class *nokia.maps.geo.ICoordinate* :

altitude, *altMode*, *latitude*, *longitude*

Interface Description

This interface defines properties for a data point that can be used in clustering. Each data point used for clustering purposes must conform to this interface.

Property Details

`value`: `{Number}`

This property holds a numeric value that indicates the "weight" of the the data point within the cluster. Weight is used to determine the position of the marker that represents the cluster in relation to the data points (markers) included in the cluster. Positioning the cluster marker by weight means that it is placed closer to the data points (markers) with the highest `value` (this property) than to any others. It is the default way to position the cluster marker, the other options being "center" and "first". "Center" ensures that the cluster marker is placed in the center of the cluster, while "first" means that the position of the cluster marker coincides with the first data point (marker) in the cluster.

You can determine the position of the cluster marker explicitly when initializing *nokia.maps.clustering.MarkerTheme*. To do that, set the property "position" on an instance of nokia.maps.clustering.MarkerTheme.Options#position - the object is the argument to the MarkerTheme constructor. The example below demonstrates how to set weight-based positioning, using a constant defined on the class *nokia.maps.clustering.MarkerTheme*:

```
var map = new nokia.maps.map.Display(...);
clusterProvider = new nokia.maps.clustering.ClusterProvider(map, {
 theme : new nokia.maps.clustering.MarkerTheme({
  position: nokia.maps.clustering.MarkerTheme.POSITION_WEIGHT_CENTER
 })
});
```

Note that if `value` is not set on any of the data points in the cluster, you can improve clustering performance by specifying "center" as the configuration setting for `MarkerTheme`, while achieving a similar visual effect as that created by "weight".

Default Value: `1`

www.EngineeringBooksPdf.com

Interface: ITheme

This interface is a member of ***nokia.maps.clustering***.

Interface Summary

This interface defines how a cluster is to be shown on the map.

[*For full details, see nokia.maps.clustering.ITheme*]

Table 22: Method Summary

Methods
getClusterPresentation (dataPoints) : {*nokia.maps.map.Object*} This method retrieves an object that can be displayed on the map to represent a cluster.
getNoisePresentation (dataPoint) : {*nokia.maps.map.Object*} This method retrieves an object that can be displayed on the map to represent a single noise point.

Interface Description

A variety of representations of marker cluster are possible. For example, a cluster can be shown as a rectangle with an outline boundary, or it can be displayed as a marker, etc. All cluster display themes must conform this interface to allow instances of `ClusteringProvider` to communicate with them.

Method Details

`getClusterPresentation``(dataPoints): {`*`nokia.maps.map.Object`*`}`

This method retrieves an object that can be displayed on the map to represent a cluster.

Parameters:

`dataPoints`: {*`nokia.maps.clustering.IClusterPoint`*`[] |` *`nokia.maps.clustering.Cluster`*`}`

A collection of objects representing data points (each object contains latitude, longitude and optionally a `value` attribute to indicate the weight of the point); alternatively, the argument can be an instance of *nokia.maps.clustering.Cluster*

www.EngineeringBooksPdf.com

Returns:

{*nokia.maps.map.Object*}

An object that can be displayed on the map to represent a cluster

getNoisePresentation(dataPoint): {*nokia.maps.map.Object*}

This method retrieves an object that can be displayed on the map to represent a single noise point.

Parameters:

dataPoint: {*nokia.maps.clustering.IClusterPoint*}

An object representing a data point (contains latitude, longitude and optionally weight)

Returns:

{*nokia.maps.map.Object*}

An object that can be displayed on the map to represent a noise point

Class: Index

This class is a member of ***nokia.maps.clustering***.

Class Summary

This class holds clustering index based on R-Tree.

[*For full details, see nokia.maps.clustering.Index*]

Table 23: Method Summary

Methods
add (coordinate) This method adds a data point to the index.
clean () This method removes all the references to the data points from the index.
destroy () This method cleans up all internal objects and prepares the given instance of this class to be destroyed.

www.EngineeringBooksPdf.com

Methods
getNeighborhood `(point, eps, seacrhAreaSize)` This method finds all the data points which are in the rectangular area center of which is the given point, and both width and height are 2 * eps in size.
remove `(coordinate)` This method removes the data point specified by the caller from the index.

Class Description

Clustering index based on R-Tree.

Constructor Details

nokia.maps.clustering.Index(config)

This method creates new clustering index. It builds an *RTree* data structure on top of the clustering data, which can offer a significant improvement in the speed of data retrieval operations related to spatial objects.

Parameters:

config:	{*nokia.maps.clustering.RTreeConfiguration*} [optional] Configuration settings for RTree

Method Details

add(coordinate)

This method adds a data point to the index.

Parameters:

coordinate:	{*nokia.maps.clustering.IClusterPoint*} An object representing a data point (contains latitude and longitude)

clean()

This method removes all the references to the data points from the index. The effect is as if the index were created with an empty list of data points.

www.EngineeringBooksPdf.com

`destroy()`

This method cleans up all internal objects and prepares the given instance of this class to be destroyed.

`getNeighborhood(point, eps, seacrhAreaSize)`

This method finds all the data points which are in the rectangular area center of which is the given point, and both width and height are `2 * eps` in size.

Parameters:

`point:`	`{`*`nokia.maps.clustering.IClusterPoint`*`}` A data point object whose neighborhood is to be established
`eps:`	`{Number}` Size of the neighborhood to find
`seacrhAreaSize:`	`{Number}` [optional] Size of the "world" in pixels; used in cases when there is a need to specify that the "world is round" and it is desirable to allow the search to continue on the opposite side of the map or the search area.

Returns:

nokia.maps.util.RTreeRecord[] An array of data points retrieved from the square area with `2 * eps` sides and with the supplied point as a center; each point has the property `$coordinate` which holds a reference to the actual data point provided when calling the method *nokia.maps.clustering.Index#add*

`remove(coordinate)`

This method removes the data point specified by the caller from the index.

Parameters:

`coordinate:`	`{`*`nokia.maps.clustering.IClusterPoint`*`}`

www.EngineeringBooksPdf.com

An object representing a data point (contains latitude and longitude)

Throws:

run-time error if no data point object is provided, or if it the supplied object does not conform to the interface *nokia.maps.clustering.IClusterPoint*

Class: MarkerTheme

This class is a member of ***nokia.maps.clustering***.

Class Summary

An instance of this class represents each cluster and noise point on the map as a marker.

[*For full details, see nokia.maps.clustering.MarkerTheme*]

Table 24: Property Summary

Properties
`static` ***POSITION_CENTER***`: {String}` This constant provides a value for nokia.maps.clustering.MarkerTheme.Options#position.
`static` ***POSITION_FIRST***`: {String}` This constant provides a value for nokia.maps.clustering.MarkerTheme.Options#position.
`static` ***POSITION_WEIGHT_CENTER***`: {String}` This constant provides a value for nokia.maps.clustering.MarkerTheme.Options#position.

Table 25: Method Summary

Methods
getClusterCoordinate `(data) : {`*nokia.maps.geo.ICoordinate*`}` This method retrieves an object containing the geographic coordinates of the marker that represents a cluster.
getClusterPresentation `(data) : {`*nokia.maps.map.Marker*`}` This method retrieves a marker representing a cluster.
`static` ***getColor*** `(clusterSize) : {String}` This method retrieves a color definition as a hex string in the format #RRGGBB.
getNoisePresentation `(dataPoint) : {`*nokia.maps.map.StandardMarker*`}`

www.EngineeringBooksPdf.com

Methods
This method retrieves a standard marker representing a noise point.

Class Description

This class conforms to the interface *nokia.maps.clustering.ITheme*. Each cluster appears on the map as a circle showing a number indicating the size of the cluster. The color of the circle, its size and shadow depend on the size of the cluster. By contrast, noise points are presented as small blue dots, with white stroke color.

Constructor Details

`nokia.maps.clustering.MarkerTheme(position)`

This method creates an instance of `MarkerTheme`. It accepts configuration settings as an argument.

Parameters:

`position`:	`{String}` [optional] A value indicating the position of the cluster presenter marker; it should be one of the static variables POSITION_CENTER, POSITION_FIRST and POSITION_WEIGHT_CENTER defined in this class; if the method receives an unsupported position identifier, it uses POSITION_WEIGHT_CENTER by default

Property Details

`static` **`POSITION_CENTER`**: `{String}`

This constant provides a value for nokia.maps.clustering.MarkerTheme.Options#position. It ensures that the cluster marker is drawn in the center of the minimum rectangle containing all data points in the cluster.

`static` **`POSITION_FIRST`**: `{String}`

This constant provides a value for nokia.maps.clustering.MarkerTheme.Options#position. It ensures that the cluster marker is placed at the same location as the first data point in the cluster.

`static` **`POSITION_WEIGHT_CENTER`**: `{String}`

www.EngineeringBooksPdf.com

This constant provides a value for nokia.maps.clustering.MarkerTheme.Options#position. It ensures that the cluster marker is placed closer to the data points (markers) with the highest `value` ("weight") than to any others.

Method Details

`getClusterCoordinate``(data): {`*`nokia.maps.geo.ICoordinate`*`}`

This method retrieves an object containing the geographic coordinates of the marker that represents a cluster.

Parameters:

`data`: {*`nokia.maps.clustering.IClusterPoint`*`[] |` *`nokia.maps.clustering.Cluster`*}

A collection of objects representing data points (contain latitude and longitude) or an instance of *nokia.maps.clustering.Cluster*; in addition, each point may contain a "value" attribute if you wish to position the cluster marker according to the "weight" center of the cluster (see also *nokia.maps.clustering.IClusterPoint*)

Returns:

{*`nokia.maps.geo.ICoordinate`*}

An object containing the geographic coordinates of the position of cluster marker

`getClusterPresentation``(data): {`*`nokia.maps.map.Marker`*`}`

This method retrieves a marker representing a cluster.

Parameters:

`data`: {*`nokia.maps.clustering.IClusterPoint`*`[] |` *`nokia.maps.clustering.Cluster`*}

A collection of objects representing data points (contain latitude and longitude) or an instance of *nokia.maps.clustering.Cluster*; in addition, each point may contain a "value" attribute if you wish to position the

www.EngineeringBooksPdf.com

cluster marker according to the "weight" center of the cluster (see also *nokia.maps.clustering.IClusterPoint*)

Returns:

{*nokia.maps.map.Marker*}

An instance of *nokia.maps.map.StandardMarker* showing a numeric value indicating the number of elements inside the cluster. The color of the marker also depends on the size of the cluster

static **getColor**(clusterSize): {String}

This method retrieves a color definition as a hex string in the format #RRGGBB. The retrieved color definition, depends on the cluster size.

- #76D100 - if cluster size is smaller than 10
- #FF6900 - if cluster size is bigger than 10, but less than 25
- #F03C00 - if cluster size is bigger than 25, but less than 50
- #B50015 - if cluster size is bigger than 100

Parameters:

clusterSize: {Number}

A value indicating the size of the cluster

Returns:

{String} An string containing the color definition in the format #RRGGBB

getNoisePresentation(dataPoint): {*nokia.maps.map.StandardMarker*}

This method retrieves a standard marker representing a noise point.

Parameters:

dataPoint: {*nokia.maps.clustering.IClusterPoint*}

An object representing a noise point, containing latitude, longitude and optionally weight

www.EngineeringBooksPdf.com

Returns:

{*nokia.maps.map.StandardMarker*}

A standard marker positioned at the location supplied by the argument

Class: Noise

This class is a member of ***nokia.maps.clustering***.

Class Summary

This class represents noise point on the map.

[*For full details, see nokia.maps.clustering.Noise*]

Table 26: Method Summary

Methods
getCoordinate `() : {`*nokia.maps.geo.Coordinate*`}` This method retrieves an object containing the geographic coordinates of the given noise point.
getIcon `(theme, resetTheMarker)` This method retrieves the icon representing of the noise point on the map.

Class Description

This class represents a noise point - a point that is not part of a cluster and is indicated by an individual marker. Note that at the highest zoom level at which clustering applies (see also *nokia.maps.clustering.ClusterProvider*), it is possible that all or most data points are presented as noise points.

Constructor Details

nokia.maps.clustering.Noise`(point)`

This method creates an instance of `Noise`.

Parameters:

`point`: {*nokia.maps.clustering.IClusterPoint*} [optional]

A data point object that provides the coordinates for a noise point

www.EngineeringBooksPdf.com

Method Details

`getCoordinate``(): {`*`nokia.maps.geo.Coordinate`*`}`

This method retrieves an object containing the geographic coordinates of the given noise point.

Returns:

{*`nokia.maps.geo.Coordinate`*}

An object containing the geographic coordinates of the noise point

`getIcon``(theme, resetTheMarker)`

This method retrieves the icon representing of the noise point on the map.

Parameters:

`theme`: {*`nokia.maps.clustering.ITheme`*}

A theme object to use when presenting cluster on the map

`resetTheMarker`: {`Boolean`} [optional]

A flag indicating whether the internal marker is to be updated (`true`) or whether the cached marker is to be retrieved (`false`; this optional argument can be used when the theme for existing clusters has been modified

Interface: RTreeConfiguration

This interface is a member of ***`nokia.maps.clustering`***.

Interface Summary

This interface defines configuration options for R-Tree.

[*For full details, see nokia.maps.clustering.RTreeConfiguration*]

Table 27: Property Summary

Properties
`algorithm``: {Number}` This property specifies the partitioning algorithm for RTree.
`max``: {Number}`

www.EngineeringBooksPdf.com

Properties
This property holds the maximum number of objects per node.
min: {Number} This property holds the minimum number of objects per node.

Interface Description

This interface defines configuration options for *RTree*. It is used as a template for configuration settings used when creating an instance of *nokia.maps.clustering.Index*.

Property Details

algorithm: {Number}

This property specifies the partitioning algorithm for RTree.

The possible values are:

- 0 or nokia.maps.util.RTree.QUADRATIC_PARTITIONING
- 1 or nokia.maps.util.RTree.LINEAR_PARTITIONING
- 2 or nokia.maps.util.RTree.LINEAR_MOD_PARTITIONING
- 3 or nokia.maps.util.RTree.DUMMY_PARTITIONING

Default Value: 0

max: {Number}

This property holds the maximum number of objects per node. Its value must not be less than 2.

Default Value: 32

min: {Number}

This property holds the minimum number of objects per node. Its value must not be less than 1 or greater than max/2. The time needed for querying the index dependent on this property. A large min value reduces the height of the tree and improves space utilization. Too large a min, however, reduces the tree to a linear index, which has the same effect as having index at all. A small value of min on the other hand, causes a higher tree, partitioning the objects more. When choosing min too small, too many nodes have to be examined when searching the tree, increasing the required search

here

www.EngineeringBooksPdf.com

time. A trade-off between a wide tree and a high tree has to be made. Therefore, the parameters `min` and `max` can be tuned as part of performance tuning.

Default Value: `12`

Class: RectangleTheme

This class is a member of ***nokia.maps.clustering***.

Class Summary

This class creates a representation of each cluster on the map as a rectangle which contains all the data points that belong to the cluster.

Deprecated: Since 2.5.0

[*For full details, see nokia.maps.clustering.RectangleTheme*]

Table 28: Method Summary

Methods
getClusterPresentation `(data) : {`*nokia.maps.map.Rectangle*`}` This method retrieves the smallest rectangle that encloses all the data points in the cluster provided by the caller.
getNoisePresentation `(dataPoint) : {`*nokia.maps.map.StandardMarker*`}` This method retrieves a standard marker representing a noise point.

Class Description

The class creates a representation of a cluster on the map, presenting all noise points as standard markers, while clusters are shown as instances of *nokia.maps.map.Rectangle*. The class conforms to the interface *nokia.maps.clustering.ITheme*.

Constructor Details

~~**nokia.maps.clustering.RectangleTheme**`()`~~

This method creates an instance of ~~`RectangleTheme`~~.

Deprecated: Since 2.5.0

www.EngineeringBooksPdf.com

Method Details

getClusterPresentation(data): {*nokia.maps.map.Rectangle*}

This method retrieves the smallest rectangle that encloses all the data points in the cluster provided by the caller.

Parameters:

data: {*nokia.maps.clustering.IClusterPoint*[] | *nokia.maps.clustering.Cluster*}

A collection of data point objects containing latitude and longitude, or an instance of *nokia.maps.clustering.Cluster* class

Returns:

{*nokia.maps.map.Rectangle*}

An object representing a rectangle that encloses all the data points in the cluster

getNoisePresentation(dataPoint): {*nokia.maps.map.StandardMarker*}

This method retrieves a standard marker representing a noise point.

Parameters:

dataPoint: {*nokia.maps.clustering.IClusterPoint*}

An object that represents the noise point for which to retrieve the marker (contains latitude, longitude and optionally weight)

Returns:

{*nokia.maps.map.StandardMarker*}

A standard marker positioned at the coordinates of the data point supplied by the caller

Namespace: dom

This namespace is a member of ***nokia.maps***.

www.EngineeringBooksPdf.com

Namespace Summary

This namespace implements support for managing HTML documents, including DOM-related events, and for HTML 5.

Namespace Description

This namespace implements support for managing HTML documents, including DOM-related events, and for HTML 5.

Class: DataTransfer

This class is a member of ***nokia.maps.dom***.

Class Summary

This class is a implementation of the HTML 5 DataTransfer interface.

[*For full details, see nokia.maps.dom.DataTransfer*]

Table 29: Property Summary

Properties
cursor: {String} This property defines the CSS cursor to be shown during non-lift dragging; the default value is "pointer".
dropEffect: {String} This property names the currently selected operation type.
effectAllowed: {String} This property names allowed operations.
files: {Object[]} This property contains references to the files that are being dragged, if any.
lift: {Boolean} This property can only be modified within a `dragstart` event, it indicates if a drag operation lifts the target or not.
readonly ***ndt***: {Object} This property holds a reference to a native data transfer object, if available.
realTime: {Boolean} This property determines if all the drag-events are to be processed in real time or if thresholds are to be applied to prevent too many events and therefore an overall performance drop.

www.EngineeringBooksPdf.com

Properties
`readonly` ***types***`: {String[]}` This property holds an array of strings with the formats that were set in the `dragstart` event.

Table 30: Method Summary

Methods
addElement `(element)` This method offers an alternative way of specifying how the user agent is to render the drag feedback.
allows `(dropEffect) : {Boolean}` This method checks if the supplied drop effect is allowed or not.
clearData `(format) : {`*nokia.maps.dom.DataTransfer*`}` This method removes the data of the specified format.
getData `(format)` This method retrieves the data specified by the caller.
hasData `(format)` This method checks if data matching the format specified by the caller exists.
setData `(format, data)` This method adds the data specified by the caller.
setDragImage `(image, left, top)` This method sets the element to be used to generate the drag feedback.

Class Description

This class is a browser-independent implementation of the HTML 5 interface *DataTransfer*. The class extends the capabilities stipulated in the HTML 5 specification by allowing native JavaScript objects as values. If there is native support and the value is a string, then the data is copied into the native data transfer object.

Constructor Details

`nokia.maps.dom.DataTransfer``(nativeDataTransfer)`

This method initializes a new instance of `DataTransfer`

Parameters:

www.EngineeringBooksPdf.com

`nativeDataTransfer`:	`{Object}` [optional] The reference to a native data transfer object (requires browser support for native drag and drop)

Property Details

`cursor`: `{String}`

This property defines the CSS cursor to be shown during non-lift dragging; the default value is "pointer".

`dropEffect`: `{String}`

This property names the currently selected operation type. To succeed, the operation must be allowed by the attribute `effectAllowed`.

The value of the property can be set to change the selected operation. The possible values are `none`, `copy`, `link`, and `move`.

`effectAllowed`: `{String}`

This property names allowed operations.

The value of the property can be set to modify the list of allowed operations. The possible values are `none`, `copy`, `copyLink`, `copyMove`, `link`, `linkMove`, `move`, `all`, and `uninitialized`.

`files`: `{Object[]}`

This property contains references to the files that are being dragged, if any.

`lift`: `{Boolean}`

This property can only be modified within a `dragstart` event, it indicates if a drag operation lifts the target or not.

If an object is dragged, but not lifted, no `dragenter`, `dragover`, `dragleave` or `drop` events are dispatched. Dragging without lift occurs, for example, when the slider or the scale bar is moved, or when the map is panned. It means that something is dragged within a limited area and cannot leave

www.EngineeringBooksPdf.com

that area -- for example, the thumb shift of a zoom slider cannot leave the zoom slider, therefore the zoom slider handles the movement of the thumb shift, and consequently updates the slider within the `drag` event, without notifying any other element in the Web site or outside the browser window.

In dragging without lift, the cursor is not defined by the `dropEffect`, but by the `cursor` property.

`readonly` **`ndt`**`: {Object}`

This property holds a reference to a native data transfer object, if available.

`realTime``: {Boolean}`

This property determines if all the drag-events are to be processed in real time or if thresholds are to be applied to prevent too many events and therefore an overall performance drop. The property has the best effect if set directly within the `dragstart` event, otherwise it will only be partially "near-time".

Note that this property has no effect in native drag and drop and we recommended that you avoid real-time drag and drop operations if possible.

`readonly` **`types`**`: {String[]}`

This property holds an array of strings with the formats that were set in the `dragstart` event. In addition, if any files are being dragged, one of the types is the string "Files".

Method Details

`addElement``(element)`

This method offers an alternative way of specifying how the user agent is to render the drag feedback. It adds an element to the `DataTransfer` object.

Parameters:

`element:`	`{Node}`
	The element to add as drag feedback for the user

`allows``(dropEffect): {Boolean}`

This method checks if the supplied drop effect is allowed or not.

www.EngineeringBooksPdf.com

This is a proprietary member and not part of the implementation of W3C interface specifications.

Parameters:

`dropEffect:` `{String}`

The drop effect to check: `copy`, `move` or `link`

Returns:

`{Boolean}` A value is `true` if the effect is allowed, `false` otherwise

`clearData(format): {nokia.maps.dom.DataTransfer}`

This method removes the data of the specified format. It removes all data if the argument is omitted.

Parameters:

`format:` `{String}`

The format for which the data should be removed.

Returns:

`{nokia.maps.dom.DataTransfer}`

The data transfer object itself (`this`).

`getData(format)`

This method retrieves the data specified by the caller. If there is no matching data, an empty string is returned.

Parameters:

`format:` `{String}`

The format of the data to return

Returns:

An {Object} containing the data

www.EngineeringBooksPdf.com

`hasData(format)`

This method checks if data matching the format specified by the caller exists.

Parameters:

`format:` `{String}`

The format of the data to check for

Returns:

A {Boolean} value, `true` if the data in the given format is available; `false` otherwise.

`setData(format, data)`

This method adds the data specified by the caller.

Parameters:

`format:` `{String}`

The format of the data

`data:` `{Object}`

The data

Returns:

An instance of {nokia.maps.dom.DataTransfer} representing the data transfer object itself (`this`)

`setDragImage(image, left, top)`

This method sets the element to be used to generate the drag feedback. The element can be any element; if it is an `img`, then the user agent should use the element's image (at its intrinsic size) to generate the feedback, otherwise the user agent should base the feedback on the given element (but the exact mechanism for doing so is not specified).

Parameters:

www.EngineeringBooksPdf.com

`image:`	`{node}` The feedback element to be used as drag feedback
`left:`	`{Object}` [optional, default: 0] The horizontal pixel offset of the left border of the image relative to the cursor, a positive number moves the image to the right of the cursor, a negative number moves the image left to the cursor
`top:`	`{Object}` [optional, default: 0] The vertical pixel offset of the top border of the image relative to the cursor, a positive number moves the image to the bottom of the cursor, a negative number moves the image top to the cursor

Example:

```
 // If "imageNode" is a DOM image with a size of 50 pixel,
// then this would attach this image to the cursor,
// align it 25 pixel to top-left
event.dataTransfer.setDragImage( imageNode, -25, -25 );
```

Interface: DragEvent

This interface is a member of ***`nokia.maps.dom`***.

Extends: *nokia.maps.dom.Event*

Interface Summary

This event is fired for all kind of drag operations.

[*For full details, see nokia.maps.dom.DragEvent*]

Table 31: Property Summary

Properties
`dataTransfer``: {Number}` The property `dataTransfer` contains context information maintained during the entire dragging operation, from `dragstart` until the `dragend` event.

Directly Inherited Properties

www.EngineeringBooksPdf.com

Inherited from class *nokia.maps.dom.Event* :

AT_TARGET, *bubbles*, *BUBBLING_PHASE*, *canBubble*, *cancelable*, *canSicker*, *CAPTURING_PHASE*, *currentTarget*, *defaultPrevented*, *eventPhase*, *namespaceURI*, *nativeEvent*, *page*, *propagation*, *PROPAGATION_OK*, *PROPAGATION_STOP*, *PROPAGATION_STOP_IMMEDIATE*, *target*, *timeStamp*, *type*

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.dom.Event* :

cancel, *clone*, *preventDefault*, *preventUnload*, *stopImmediatePropagation*, *stopPropagation*

Interface Description

This interface represents events fired for all kind of drag operations. For more information about drag events please refer to the `nokia.maps.dom.DragEventTarget` class.

Note that this class represents an unimplemented interface. It is included here to document its properties. The class is derived from *nokia.maps.dom.Event*, but, in addition to the properties of the parent class, it has the properties described here.

Property Details

`dataTransfer``: {Number}`

The property `dataTransfer` contains context information maintained during the entire dragging operation, from `dragstart` until the `dragend` event. It can be used to store data while the drag operation is ongoing. The object always has the same reference, therefore it is possible to modify its contents (see `nokia.maps.dom.DataTransfer`), but not to replace it with a new one.

Note that although according to the W3C specification, it is only possible to store binary safe strings in the data transfer object, this is not the case in this implementation. However, only strings may be passed from one window to another, and therefore adding a JavaScript object to the data transfer object prevents strings from being transfered into another window.

Interface: DragEventTarget

This interface is a member of ***`nokia.maps.dom`***.

www.EngineeringBooksPdf.com

Interface Summary

This class is a *virtual* interface described here for reference only.

[*For full details, see nokia.maps.dom.DragEventTarget*]

Table 32: Event Summary

Events
drag
This event is fired at the target object of the `dragstart` event while a drag operation is in propgress.
dragend
This event is fired at the end of a drag operation at the object that was dragged (the target of the `dragstart` event).
dragenter
This event is fired at an object if the mouse/finger is moved into the visible area of the object during a drag operation.
dragleave
This event is fired at the current drop target if the the mouse/finger leaves the visible area of the target.
dragover
This event is fired at the current drop target while the mouse/finger is on/above the drop target.
dragstart
This event is fired at an object that has the property `isDraggable` set to `true` and after a mousedown/touch has occurred and the mouse/finger was moved at least three pixels.
drop
This event is fired at the current drop target if the mouse button or finger is released on/above it, which means that the `dragenter` event and the `dragover` events were canceled, so their `preventDefault` methods were called and the `allowedEffect` property matches the `dropEffect` property.

Interface Description

Each class implementing this interface delcares that it can act as the target for certain events. Each event in this interface (and therefore also within the classes implementing the interface) represents an event of a specific type.

The following example shows event handling for events of the type "click":

```
// Note that "obj" can be either a DOM node or any other JavaScript object.
var obj = nokia.maps.dom.EventTarget( {} );
obj.addListener("click", function (evt) {
 console.log("This is the '"+evt.type+"' event!");
});
```

www.EngineeringBooksPdf.com

```
obj.dispatch( new nokia.maps.dom.Event({
 type: "click"
});
```

The example creates an instant of `nokia.maps.dom.EventTarget`, adds a listener for "click" events to it, and dispatches a "click" event to all registered listeners (in this case one) - the listeners receive the object that represents the target of the event.

For more information about dispatching events, please refer to the documentation of the *nokia.maps.dom.EventTarget*.

Drag and drop in a nutshell

The following description discusses event handling for drag and drop events. These are likely to be the most complex events, although once you have understood them, you should find them quite straightforward to process. The W3C homepage offers a very detailed explanation of drag and drop - please see *http://dev.w3.org/html5/spec/dnd.html*. Our text attempts to capture the information you need in a nutshell, plus it covers some information about the non-standard *not lifted* dragging, which is an arbitrary extension to the W3C specification and should help you use drag and drop events for certain special cases (such as implementing sliders).

Drag and drop concerns seven events, three of them (`dragstart`, `drag` and `dragend`) are fired at the DOM node that is dragged and four (`dragenter`, `dragover`, `dragleave` and `drop`) are fired at the DOM node over which the source node is dragged or onto which the source node is dropped (this does not occur in *not lifted* dragging, but more about that later).

Before we start

First, however, please note that the following code is always expected to be executed before the small code examples we provide below:

```
// Create a few shortcuts.
var Page = nokia.maps.dom.Page,
  EventTarget = nokia.maps.dom.EventTarget;

// Query page support for the document. This is very
// important, but needs only to be done once.
Page(document);
```

Dragging Basics

The first step is to ensure that the DOM node to be dragged is draggable. The class *nokia.maps.dom.EventTarget* offers support in this respect through a method that takes care of all browser-specific details:

```
// Make a DOM node an event target and draggable.
EventTarget(node).enableDrag();
```

www.EngineeringBooksPdf.com

This simple code guarantess that the browser fires a `dragstart` event as soon as the user tries to drag node or any of its children. What is more, this is valid for touch screens (for example the iPhone). If the event is canceled, then dragging is disallowed, otherwise it is allowed (by default). While a drag operation is in progress, no other mouse, touch or keyboard events are fired.

Note that the above applies also to the `mouseup` and `click` events. You can get a `mousedown` event, but no `mouseup` or `click` event follow it if the `mousedown` event started a drag operation and `dragstart` event is not canceled with a call to `preventDefault()`. Therefore, it is best not only to register a listener for `mousedown` and `mouseup` (assuming you want to track these two events), but also for `dragend` in the *capture phase*. A `mousedown` followed by a `dragend` indicates the mouse button has been released - a `mouseup` is not generated. This means you can simply use the `dragend` as a `mouseup` event. If you recieved a `mousedown` at a node, you can be sure that you will receive a `dragend` at the same node at least within the *capture phase*.

Each of the seven drag events has a special property called `dataTransfer`, which holds an instance of *`nokia.maps.dom.DataTransfer`*. This object contains information about the drag operation and is used to control it. In addition, the object can be used to transfer data between the different drag listeners, as it is guaranteed that the object itself is attached to all drag events from `dragstart` to `dragend`. However, the next drag sequence has a new `dataTransfer` object associated with it (so you cannot transfer data between to separate drag sequences).

Dragging from the point of view of drag target

The event `dragstart` has a property named `effectAllowed`. It determines what kind of operation can be performed on the dragged object, for example, whether the object can be copied, linked and/or moved. The value of this property is set by the event handler to one of the following strings: "uninitialized", "none", "copy", "copyLink", "copyMove", "all", "link", "linkMove" or "move". The default value is "uninitialized" and has the same meaning as "all".

The `dragstart` event allows you to define the visual feedback of the drag as well. There are two methods available on the data transfer object for this purpose: `setDragImage(node, offsetX, offsetY)` and `addElement(node)`. You can only have one drag image (a picture visible while dragging is in progress), so a second call to `setDragImage()` overwrites the previously set image node. `addElement()` adds an unlimited number of additional elements to the visual feedback. The visual feedback (all added elements and/or the drag image) is rendered relative to the hot spot of the mouse cursor or the touch point of the finger on a touch screen and is shown stretching to the right and down from the mouse pointer or the dragging finger. You can fine-tune where the drag image appears via its offset coordinates. The offset has no effect for the elements added using the `addElement()`, but their style property `position` can be set to "absolute" and then they can be offset using the CSS properties `style.left` and `style.top`.

While dragging is in progress, the brower fires a "drag" event every few milliseconds at the source node that is being dragged. If the event is canceled (`preventDefault` is called), dragging is aborted,

www.EngineeringBooksPdf.com

otherwise it continues. In most cases, the `drag` event can be ignored, except, for example, for *not lifted* dragging to which we return shortly.

When dragging is finished, the source node (the drag target) receives a `dragend` event with information reflecting the action that was performed when the dragged object reached the drop zone. The information is stored in the property `dropEffect` of the data transfer object and is "none", "copy", "move" or "link". If the drop was aborted or failed, the effect is none. This is important information in the example that follows, because if the dragged element was not moved, the node must be re-inserted into the document at the position it occupied before draggin began:

```
// This function makes an image node draggable.
var makeImageDraggable = function ( node ) {
// Create a closure so that every call to this method
// can handle it's own node.
(function (node) {
  // Make the image draggable.
  EventTarget(node).enableDrag();

  // These variables are used later to put the image
  // back where it was should dragging fail.
  var sourceNodeParent;
  var sourceNodeNextSibling;

  // Register a dragstart listener.
  node.addListener("dragstart", function (evt) {
 // Remember the parent node and next sibling of the image.
 sourceNodeParent = node.parentNode;
 sourceNodeNextSilbing = sourceNode.nextSilbing;

 // Detach the image from the document.
 sourceNodeParent.removeChild (node);

 // Attach the image to the cursor so that it is dragged around.
 evt.dataTransfer.setDragImage( sourceNode, -evt.targetX || 0, -evt.targetY
|| 0);

 // Allow all kinds of drag operations.
 evt.dataTransfer.effectAllowed = "all";

 // Prevent any other drag handlers from receiving this event,
 // but do not cancel the event, because that would abort
 // dragging.
 evt.stopImmediatePropagation();
  }, false);

  // Register a dragend listener.
  node.addListener("dragend", function (evt) {
 // If the image was not moved somewhere else
 if (evt.dataTransfer.dropEffect!=="move") {
   // we have to move the image back to where it was.
   if (sourceNodeNextSilbing)
  sourceNodeParent.insertBefore(node, sourceNodeNextSilbing);
```

www.EngineeringBooksPdf.com

```
    else
   sourceNodeParent.appendChild(node);
  }
  // Note: If the image was moved, we don't need to do anything!

  // Let's cancel the event now that we have processed it. The event
  // must not be processed by the browser or any other listener.
  event.cancel();
   }, false);
})(node);
};
```

So far we have explained one aspect of drag and drop: what you need to do if you want to make a DOM node draggable. Next, we consider how to create a drop zone, where the dragged object can be dropped. Our next example extends the previous one by allowing the image to be dropped anywhere within the document.

The drag from the drop target perspective

A dropzone can be any DOM node or JavaScript object that is an instance of *`nokia.maps.dom.EventTarget`*. Whenever the mouse is moved onto such a node, the browser fires a `dragenter` event at that node. If the event is not canceled (by calling `preventDefault`), the browser estimates that a drop is not handled by the node and disallows a drop to it. If the event is canceled (`preventDefault` has been called), the listener must set the property `dropEffect` on the data transfer object to indicate the operation that the node wants to perform with the dragged element. If an image is dragged, `dropEffect` must be said to "move".

The next event to be fired is `dragover`. It is fired regularly like the `drag` event, but it is fired at the current drop target. This event must be canceled (by calling `preventDefault`) and the property `dropEffect` on the data transfer object must be updated to indicate the desired operation ("none", "copy", "link" or "move". If the event is not canceled, the drop is denied and the `dropEffect` is set to "none".

Finally if the user releases the mouse button or finger (touch screen) above a drop target that has set the `dropEffect` to "copy", "link" or "move", a `drop` event is fired at the drop target. The drop handler executes the required drop effect and cancels the event (by calling `preventDefault`). If the event is not canceled, the browser automatically executes the drop action (which only works for very specific nodes).

The following code shows a complete drag and drop example for the image:

```
<html>
<head>
 <!-- please load the API here -->
 <script language="JavaScript">
 // NOTE: This is very important, otherwise no event handling at all
 // is possible!
 var page = nokia.maps.dom.Page(document);
```

www.EngineeringBooksPdf.com

```
// Create a shortcut to the event target class.
var EventTarget = nokia.maps.dom.EventTarget;

// This function makes an image node draggable.
var makeImageDraggable = function ( node ) {
  // Create a closure so that every call to this method
  // can handle its own node.
  (function (node) {
 // Make the image draggable.
 EventTarget(node).enableDrag();

 // These variables are used later to put the image
 // back to where it was originally, if dragging fails.
 var sourceNodeParent;
 var sourceNodeNextSibling;

 // Register a dragstart listener.
 node.addListener("dragstart", function (evt) {
   // Remember the parent node and next sibling of the image.
   sourceNodeParent = node.parentNode;
   sourceNodeNextSilbing = node.nextSilbing;

   // Detach the image from the document
   sourceNodeParent.removeChild (node);

   // Attach the image to the cursor so that it is dragged around.
   evt.dataTransfer.setDragImage( node, -evt.targetX || 0, -evt.targetY ||
0);

   // Allow all drag operations.
   evt.dataTransfer.effectAllowed = "all";

   // Add the image node into the data transfer for the drop zone.
   evt.dataTransfer.setData("image/gif", node);

   // Prevent that any other drag handler to receive this event,
   // but we must not cancel the event, otherwise the
   // dragging is aborted.
   evt.stopImmediatePropagation();
 }, false);

 // Register a dragend listener.
 node.addListener("dragend", function (evt) {
   // If the image was not moved somewhere else
   if (evt.dataTransfer.dropEffect!=="move") {
  // we have to move the image back to where it was.
  if (sourceNodeNextSilbing)
    sourceNodeParent.insertBefore(node, sourceNodeNextSilbing);
  else
    sourceNodeParent.appendChild(node);
   }

   // Note: If the image was moved, we don't need to do anything!

 // Let's cancel the event now that we have processed it. The event
```

www.EngineeringBooksPdf.com

```
  // must not be processed by the browser or any other listener.
    evt.cancel();
  }, false);
   })(node);
 };

 function initDnD() {
   // First of all make the image draggable.
   makeImageDraggable (document.getElementById("draggableImage") );

   // Get the DOM node for our drop zone.
   var dropZone = EventTarget(document.getElementById("dropzone"));

   // If the draggable image is dragged into our drop zone
   dropZone.addListener("dragenter", function (evt) {
  // Allow all GIF images to be moved here.
  if (evt.dataTransfer.hasData("image/gif")) {
    evt.dataTransfer.dropEffect = "move";
    evt.cancel();
  }
  }, false);

   // While the draggable image is moved onto the drop zone
   dropZone.addListener("dragover", function (evt) {
  // Allow all GIF images to be moved here.
  if (evt.dataTransfer.hasData("image/gif")) {
    evt.dataTransfer.dropEffect = "move";
    evt.cancel();
  }
  }, false);

   // If the draggable image is dropped onto our drop zone
   dropZone.addListener("drop", function (evt) {
  // If the GIF image is dropped here, add it into our drop zone
  // and set the drop effect to "move".
  if (evt.dataTransfer.hasData("image/gif")) {
    dropZone.appendChild (evt.dataTransfer.getData("image/gif"));
    evt.dataTransfer.dropEffect = "move";
    evt.cancel();
  }
  }, false);
 }
 </script>
</head>
<body onload="initDnD()">
 <div>
 <img id="draggableImage" src="http://www.w3.org/Icons/WWW/
w3c_home_nb.gif" />
 </div>
 <div id="dropzone" style="width:400px; height:300px; background-
color:#eee;">
 <p>Drop the image here</p>
 </div>
</body>
</html>
```

www.EngineeringBooksPdf.com

The *not lifted* drag and drop

The *not lifted* drag and drop is a simplified and optimized drag and drop. It is useful if you want to make draggable an element that is confined to a specific area and cannot leave that area, such as the thumb shift of a scroll bar -- once dragging begins, it must not follow the mouse freely, but must move only along the scroll bar. You can make this happen by setting the property `lift` on the data transfer object of the `dragstart` event to `false`. This causes three things:

1. The `dragenter`, `dragover`, `dragleave` and `drop` events are no longer be fired, therefore there is no drop zone for the dragged element.
2. The cursor visible while dragging can be defined by the listener of the `dragstart` and `drag` event, ignoring the `effectAllowed` and `dropEffect` properties. This can be done by modifying the property `cursor` property of the `dataTransfer` object.
3. A *not lifted* drag is always a pure *soft event*, which means simulated. The native browser drag and drop events are not be used, therefore such an event is confined to the document in which it is fired and no other element or external application can 'notice' the drag.

The following example shows how *not lifted* drag can be used to implement a slider:

```
<html>
<head>
 <!-- please load API here -->
 <script language="JavaScript">
 // NOTE: This is very important, otherwise no event handling is possible!
 var page = nokia.maps.dom.Page(document);

 // Create a shortcut to the event target class.
 var EventTarget = nokia.maps.dom.EventTarget;

 function initDnD() {
   // Let's make the scrollbar and the thumb shift draggable.
   var scrollbar = EventTarget(page.$("scrollbar") ).enableDrag();
   var knob = EventTarget(page.$("knob") ).enableDrag();

   // Attach a dragstart listener to the scrollbar.
   scrollbar.addListener("dragstart", function (evt) {
  // If the know is being dragged.
  if (evt.target===knob) {
    // Remember that the thumb shift is dragged and set the value to the
 offset
    // of the dragstart relative to the top-left corner of the target.
    evt.dataTransfer.setData("application/slider", evt.targetY || 0);

    // Switch to not lifted dragging and make the cursor a hand.
    evt.dataTransfer.lift = false;
    evt.dataTransfer.cursor = "hand";
  } else
  // If the user tries to drag the scalebar, cancel the event and
  // disallow dragging
```

www.EngineeringBooksPdf.com

```
    evt.cancel();
  }, false);

   // Attach a drag listener to the scrollbar.
   scrollbar.addListener("drag", function (evt) {
  // If the know is dragged
  if (evt.dataTransfer.hasData("application/slider")) {
    var targetY = evt.dataTransfer.getData("application/slider");

    // Calculate the absolute position of the scrollbar
    // within the document.
    var scrollbarPos = page.getClientRect(scrollbar);

    // Calculate the position of the thumb shift relative
    // to the scrollbar, parallel to the mouse cursor.
    var y = evt.pageY - scrollbarPos.top - targetY;

    // Do not allow the thumb shift to be moved outside of the scrollbar.
    if (y<0) y = 0;
    if (y+knob.offsetHeight >= scrollbar.offsetHeight)
   y = scrollbar.offsetHeight - knob.offsetHeight - 1;

    // Move the thumb shift.
    knob.style.top = y+"px";
  }
   }, false);
 }
 </script>
</head>
<body onload="initDnD()">
 <div id="scrollbar" style="position:absolute; top:10px; left:10px;
 width:30px; height: 200px; background-color:#eee; border:1px solid black;">
 <div id="knob" style="position:absolute; top:0; left:3px; width:24px;
 height:40px; background-color:black;"> </div>
 </div>
</body>
</html>
```

Event Details

drag

This event is fired at the target object of the `dragstart` event while a drag operation is in propgress. This event is fired every few milliseconds during the drag operation. The `relatedTarget` property contains a reference to the object that is currently under the mouse/finger (only for simulated drag events, not for the native onces).

Please refer to the class documentation of the *nokia.maps.dom.DragEvent* for a more detailed description of this and other drag events.

Event Handler Parameters:

www.EngineeringBooksPdf.com

evt	{*nokia.maps.dom.DragEvent*}
	An object representing the event

dragend

This event is fired at the end of a drag operation at the object that was dragged (the target of the `dragstart` event). The event is fired if the drop was aborted, failed or successful. The event signals the end of a drag operation. The state of the drop operation can be read from the `dropEffect` which can be "none", "move", "copy" or "link" and reflects the action performed at the drop target. This information can be used either to remove the dragged object (for "move") or to do nothing (for the other drop effects).

Please refer to the class documentation of the *nokia.maps.dom.DragEvent* for a more detailed description of this and other drag events.

Event Handler Parameters:	
evt	{*nokia.maps.dom.DragEvent*}
	An object representing the event

dragenter

This event is fired at an object if the mouse/finger is moved into the visible area of the object during a drag operation. If the event is **canceled** (`preventDefault` method was called at the event object), a drop at the target is allowed, otherwise a drop is cannot occur. If the drop is allowed, the target becomes the current drop target.

Note that despite the event name, its behavior is more similar to that of `mouseover` than `mouseenter`.

Please refer to the class documentation of the *nokia.maps.dom.DragEvent* for a more detailed description of this and other drag events.

Event Handler Parameters:	
evt	{*nokia.maps.dom.DragEvent*}
	An object representing the event

www.EngineeringBooksPdf.com

dragleave

This event is fired at the current drop target if the the mouse/finger leaves the visible area of the target. Note that despite the name of the event, its behavior is more like that one of `mouseout` than `mouseleave`.

Please refer to the class documentation of the *nokia.maps.dom.DragEvent* for a more detailed description of this and other drag events.

Event Handler Parameters:	
`evt`	{*`nokia.maps.dom.DragEvent`*} An object representing the event

dragover

This event is fired at the current drop target while the mouse/finger is on/above the drop target. Note that the `dragenter` event must be canceled (`preventDefault` must be called) to make the object the current drop target. So if the `dragenter` event is not canceled, then no `dragover` events are fired at all. This is event is fired every few milliseconds as long as the mouse cursor is on/above the drop target. If this event is not canceled (via `preventDefault`) the `dropEffect` property is set to "none", which disallows a drop into the drop target. If the event is canceled and the `dropEffect` is not "none", then a drop into this drop target is allowed.

Note that in spite of the name of this event, its behavior is very different from the behavior of the `mouseover` event.

Please refer to the class documentation of the *nokia.maps.dom.DragEvent* for a more detailed description of this and other drag events.

Event Handler Parameters:	
`evt`	{*`nokia.maps.dom.DragEvent`*} An object representing the event

dragstart

www.EngineeringBooksPdf.com

This event is fired at an object that has the property `isDraggable` set to `true` and after a mousedown/touch has occurred and the mouse/finger was moved at least three pixels. If the event is not canceled (`preventDefault` of the event was not called), the drag operation is permitted. The property `dataTransfer` can be used to keep track of information while a drag operation is in progress.

Please refer to the class documentation of the *nokia.maps.dom.DragEvent* for a more detailed description of this and other drag events.

Event Handler Parameters:	
`evt`	{*`nokia.maps.dom.DragEvent`*} An object representing the event

`drop`

This event is fired at the current drop target if the mouse button or finger is released on/above it, which means that the `dragenter` event and the `dragover` events were canceled, so their `preventDefault` methods were called and the `allowedEffect` property matches the `dropEffect` property.

If the event is not canceled (`preventDefault` is called) and the drop target is a text field (for example, a textarea or input element), then the content of the "text/plain" format is inserted into the area to which the mouse point is pointing or added to the end of that area. Otherwise, the `dropEffect` is set to "none" and no action takes place. If `preventDefault` was called, the sequence described above does not take place.

Please refer to the class documentation of the *nokia.maps.dom.DragEvent* for a more detailed description of this and other drag events.

Event Handler Parameters:	
`evt`	{*`nokia.maps.dom.DragEvent`*} An object representing the event

Class: Event

This class is a member of ***`nokia.maps.dom`***.

www.EngineeringBooksPdf.com

Class Summary

This class implements the W3C Event interface.

[*For full details, see nokia.maps.dom.Event*]

Table 33: Property Summary

Properties
`readonly` ***AT_TARGET***: {Number} This field is an event phase identifier, indicating the target phase, which means it is being evaluated at the event target.
bubbles: {Boolean} This property indicates whether the event is a bubbling event (`true`) or not (`false`).
`readonly` ***BUBBLING_PHASE***: {Number} This field is an event phase identifier, indicating the bubbling phase.
canBubble: {Boolean} This property indicates whether the event can bubble (`true`) or not (`false`).
cancelable: {Boolean} This property indicates whether or not an event can have its default action canceled (prevented).
canSicker: {Boolean} This property indicates whether the event can sicker (whether in the capture phase, listeners can be iterated from the top down) or not.
`readonly` ***CAPTURING_PHASE***: {Number} This field is an event phase identifier, indicating the capture phase.
currentTarget: {*nokia.maps.dom.EventTarget*} This property indicates the object whose `eventListeners` are currently being processed.
`readonly` ***defaultPrevented***: {Boolean} This property indicates whether `preventDefault()` has been called for this event.
eventPhase: {Number} This property indicates the phase in the event flow the given event has reached.
namespaceURI: {String} This property holds the namespace URI associated with the event or `null` if it is unspecified.
nativeEvent: {Event} This property holds a reference to the native DOM event on which the given normalized event object is based.

www.EngineeringBooksPdf.com

Properties
page: {*nokia.maps.dom.Page*} This property holds a reference to the page to which the given event relates.
propagation: {Number} This property indicates the status of event propagation.
PROPAGATION_OK: {Number} This field is an identifier, indicating that the propagation of the event has not been stopped.
PROPAGATION_STOP: {Number} This field is an identifier, indicating that the propagation of the event has been stopped.
PROPAGATION_STOP_IMMEDIATE: {Number} This field is an identifier, indicating that the propagation of the event has been stopped with immediate effect.
target: {*nokia.maps.dom.EventTarget*} This property holds the target object of the event.
timeStamp: {Number} This property specifies the time at which the event was created in milliseconds relative to 1970-01-01T00:00:00Z.
type: {String} This property holds the local name of the event type.

Table 34: Method Summary

Methods
cancel () : {*nokia.maps.dom.Event*} This method cancels the given event.
clone () : {*nokia.maps.dom.Event*} This method clones the given event without cloning the properties (non-recursive cloning only).
preventDefault () : {*nokia.maps.dom.Event*} This method cancels the default action for the given event.
preventUnload (msg) : {*nokia.maps.dom.Event*} This method can be used only when the given event is of the type "beforeunload" to ask the user to confirm whether he wants to leave the page.
stopImmediatePropagation () : {*nokia.maps.dom.Event*}

www.EngineeringBooksPdf.com

Methods
This method prevents other event listeners from being triggered and, in contrast to `Event.stopPropagation()`, its effect is immediate.
stopPropagation `()` : *{nokia.maps.dom.Event}* This method prevents other event listeners from being triggered, but its effect is deferred until all event listeners attached on the `Event.currentTarget` have been triggered.

Class Description

This class implements the W3C interface *Event*.

For more details about event dispatch please refer to the documentation of the class *nokia.maps.dom.EventTarget*.

Constructor Details

`nokia.maps.dom.Event(defaults)`

Creates a Event instance.

Parameters:

`defaults`: `{Object}` [optional]

If this argument is provided, all properties from it are copied into the given event object.

Property Details

`readonly` **`AT_TARGET`**`: {Number}`

This field is an event phase identifier, indicating the target phase, which means it is being evaluated at the event target.

`bubbles``: {Boolean}`

This property indicates whether the event is a bubbling event (`true`) or not (`false`).

`readonly` **`BUBBLING_PHASE`**`: {Number}`

This field is an event phase identifier, indicating the bubbling phase.

www.EngineeringBooksPdf.com

canBubble: {Boolean}

This property indicates whether the event can bubble (`true`) or not (`false`).

This is a proprietary member and not part of the W3C interface specification this class implements.

cancelable: {Boolean}

This property indicates whether or not an event can have its default action canceled (prevented). If the default action can be canceled, the value is `true`, otherwise it is `false`.

canSicker: {Boolean}

This property indicates whether the event can sicker (whether in the capture phase, listeners can be iterated from the top down) or not.

This is a proprietary member and not part of the W3C interface specification this class implements.

readonly **CAPTURING_PHASE**: {Number}

This field is an event phase identifier, indicating the capture phase.

currentTarget: {*nokia.maps.dom.EventTarget*}

This property indicates the object whose `eventListeners` are currently being processed. This is particularly useful during the capture and bubbling phases to identify where the event is in the *propagation path*.

readonly **defaultPrevented**: {Boolean}

This property indicates whether `preventDefault()` has been called for this event.

eventPhase: {Number}

This property indicates the phase in the event flow the given event has reached. The value is one of: CAPTURING_PHASE, AT_TARGET, or BUBBLING_PHASE.

www.EngineeringBooksPdf.com

namespaceURI: {String}

This property holds the namespace URI associated with the event or `null` if it is unspecified.

nativeEvent: {Event}

This property holds a reference to the native DOM event on which the given normalized event object is based. The property is not W3C-conform and is not part of the W3C specification this class implements. It contains either `null` or a reference to the native event as sent by the browser.

page: {*nokia.maps.dom.Page*}

This property holds a reference to the page to which the given event relates.

Note that this property is not part of the W3C interface specifications this class implements.

propagation: {Number}

This property indicates the status of event propagation. Its possible values are `PROPAGATION_OK`, `PROPAGATION_STOP` or `PROPAGATION_STOP_IMMEDIATE`.

This is a proprietary member and not part of the W3C interface specification this class implements.

PROPAGATION_OK: {Number}

This field is an identifier, indicating that the propagation of the event has not been stopped.

This is a proprietary member and not part of the W3C interface specification this class implements.

PROPAGATION_STOP: {Number}

This field is an identifier, indicating that the propagation of the event has been stopped.

This is a proprietary member and not part of the W3C interface specification this class implements.

PROPAGATION_STOP_IMMEDIATE: {Number}

This field is an identifier, indicating that the propagation of the event has been stopped with immediate effect.

www.EngineeringBooksPdf.com

This is a proprietary member and not part of the W3C interface specification this class implements.

target: {*nokia.maps.dom.EventTarget*}

This property holds the target object of the event.

timeStamp: {Number}

This property specifies the time at which the event was created in milliseconds relative to 1970-01-01T00:00:00Z.

type: {String}

This property holds the local name of the event type.

Method Details

cancel(): {*nokia.maps.dom.Event*}

This method cancels the given event. It stops the event propagation immediately and prevents the default action.

This is a proprietary member and not part of the W3C interface specification this class implements.

Returns:

{*nokia.maps.dom.Event*}

A reference to this event

clone(): {*nokia.maps.dom.Event*}

This method clones the given event without cloning the properties (non-recursive cloning only).

This is a proprietary member and not part of the W3C interface specification this class implements.

Returns:

{*nokia.maps.dom.Event*}

A reference to the cloned event

www.EngineeringBooksPdf.com

preventDefault(): {*nokia.maps.dom.Event*}

This method cancels the default action for the given event. Calling this method for a non-cancelable event has no effect.

Returns:

{*nokia.maps.dom.Event*}

A reference to this event

preventUnload(msg): {*nokia.maps.dom.Event*}

This method can be used only when the given event is of the type "beforeunload" to ask the user to confirm whether he wants to leave the page.

Note that this method can be useful in debugging to ensure that everything is cleared up when the user has left the page. However, bear in mind that the method cannot be used to prevent the user from leaving the page.

This is a proprietary member and not part of the W3C interface specification this class implements.

Parameters:

msg: {String}

The message the browser should display in the confirmation dialog

Returns:

{*nokia.maps.dom.Event*}

A reference to the current event

stopImmediatePropagation(): {*nokia.maps.dom.Event*}

This method prevents other event listeners from being triggered and, in contrast to Event.stopPropagation(), its effect is immediate. Once it has been called, further calls to this method have no effect.

Returns:

{*nokia.maps.dom.Event*}

A reference to this event

www.EngineeringBooksPdf.com

stopPropagation(): {*nokia.maps.dom.Event*}

This method prevents other event listeners from being triggered, but its effect is deferred until all event listeners attached on the `Event.currentTarget` have been triggered. Once it has been called, further calls to this method have no effect.

Returns:

{*nokia.maps.dom.Event*}

A reference to this event

Class: EventTarget

This class is a member of ***nokia.maps.dom***.

Class Summary

This class implements the W3C DOM Level 3 interface *EventTarget* and extends it with a number of features.

[*For full details, see nokia.maps.dom.EventTarget*]

Table 35: Property Summary

Properties
`readonly` ***isDraggable***: {Boolean} This property indicates if the given event target is draggable and may receive a `dragstart`, `drag` and `dragend` events (`true`); `false` otherwise.
`readonly` ***isEventTarget***: {Boolean} This property indicates whether an object implements the *nokia.maps.dom.EventTarget* interface (`true`) or not (`false`).
parentNode: {*nokia.maps.dom.EventTarget*} This property holds a reference to the parent node of the event target (if set).
parentNodes: {Object} This property is designed to hold a hash table that contains the "namespaceURI" as key and the corresponding value is the parent node of the given event target.

www.EngineeringBooksPdf.com

Table 36: Method Summary

Methods
addListener `(type, callback, useCapture) : {Object}` This method registers an event listener.
addListenerNS `(namespaceURI, type, callback, useCapture) : {nokia.maps.dom.EventTarget}` This method registers an event listener for events originating from a specific namespace.
addListeners `(obj)` This method provides a means of registering multiple event listeners.
`static` ***catchException*** `(enable)` This method enables exception catching in the event dispatcher to make it possible to ignore errors in event handlers or it disables exception catching in the event dispatcher for debugging purposes.
disableDrag `() : {nokia.maps.dom.EventTarget}` This method disables dragging of this event target, causing this event target not to receive `dragstart`, `drag` and `dragend` events.
disableUserSelect `() : {nokia.maps.dom.EventTarget}` This method prevents user selection of text and elements within the event target and prevents the magnifier on the iPhone or other similar mobile devices.
dispatch `(evt) : {Boolean}` This method dispatches an event.
`static` ***dispatchEvent*** `(target, event, dispatchPath) : {Boolean}` This method dispatches an event to the given event target.
enableDrag `() : {nokia.maps.dom.EventTarget}` This method enables dragging of this event target and disables the user selection, allowing this event target to receive `dragstart`, `drag` and `dragend` events.
enableUserSelect `() : {nokia.maps.dom.EventTarget}` This method allows the user to select text and elements within the event target and allows the magnifier on the iPhone or other similar mobile devices.
hitTest `(pageX, pageY) : {Boolean}` This method tests if the given x/y position relative to the document lies within the outer bounding box of the node corresponding to the given `EventTarget` object.
insertListener `(type, callback, useCapture) : {Object}` This method registers an event listener as the first listener in the listener chain.
insertListenerNS `(namespaceURI, type, callback, useCapture) : {nokia.maps.dom.EventTarget}`

www.EngineeringBooksPdf.com

Methods
This method registers an event listener for events originating from a specific namespace as the first in the listener chain.
removeAllListeners `()` This method remove all registered listeners from current EventTarget
removeListener `(type, listener, useCapture) : {`*nokia.maps.dom.EventTarget*`}` This method removes an event listener.
removeListenerNS `(namespaceURI, type, listener, useCapture) : {`*nokia.maps.dom.EventTarget*`}` This method removes an event listener for events originating from a specific namespace.

Class Description

This class implements the W3C DOM Level 3 interface *EventTarget* and extends it with a number of features. It can be used as a mixin for any JavaScript class or it can be applied at runtime to any DOM node or JavaScript object by simply casting the node/object to `EventTarget`. Note that for the sake of compatibility the W3C, some methods have been renamed. For example, `addEventListener()` becomes `addListener()`.

Usage example:

```
// Shortcut for easier code.
var EventTarget = nokia.maps.dom.EventTarget;

// Cast a DOM node into an valid nokia.maps.dom.EventTarget
// Note: The DOM node is modified by the EventTarget interface,
// therefore a second cast is not necessary.
var node = document.getElementById("whatever");
EventTarget(node);

// You can also cast normal JavaScript objects including bubbling
// and capture phases and all that DOM supports:
var myObject = {},
myParentObject = {};
EventTarget(myObject).parentNode = EventTarget(myParentObject);

// Now you can fire an event at "myObject" that will
// bubble to "myParentObject":
myParentObject.addListener("customEvent", function (evt) {
alert( evt.type );
});
myObject.dispatch(
new nokia.maps.dom.Event({
  type: "customEvent"
})
);

// Note: It is also possible to set the parentNode property of
```

www.EngineeringBooksPdf.com

```
// a JavaScript object to a DOM node. Events then flow
// into the DOM tree, although not at native level.
```

`EventTarget` offers access to the nokia.maps DOM helpers and normalizes browser event handling for this target. By default an event target is not draggable, but selectable. If this interface is implemented as a mixin, it the property `isEventTarget` must be added and set to `true`.

MooTools compatibility notes

If you have problems with MooTools then a possible fix is to include MooTools after this API is fully loaded and to replace every occurrence of "addListener" in the MooTools library with, for example, "mooAddListener", and every occurrence of "removeListener" with, for example, "mooRemoveListener". You need to do this also in all libraries that are based on MooTools. The reason is that MooTools modifies the prototypes of some native JavaScript and DOM objects and therefore causes a collision with extensions used by this API.

Note that the name clash arises, because MooTools modifies not only those DOM nodes that it uses, but patches all instances of all objects, including native browser objects. To avoid the name clashes, you must rename the MooTools methods "addListener" and "removeListener", and load MooTools after this API so that this API can keep references to the original native browser methods instead of referring to the methods modified by MooTools.

The listener queue

The listeners to events are called in reverse registration order, which means that the listener registered last is the first to be notified of an event. Therefore, if you want a listener to be notified last in an existing queue, you must register it as the first listener in the chain. This can be done by using the arbitrary non-standard method `insertListener()` or `insertListenerNS()` defined on this interface (`EventTarget`).

Note that applying this interface to a DOM node, causes methods and properties to be copied to the DOM node that might cause collisions with other frameworks. Therefore before combining *`nokia.maps.dom.EventTarget`* with any other framework, check carefully that name conflicts do not arise.

Event flow in a nutshell

Events normally trickle and bubble through the hierarchy in a DOM tree, where each node can only have one parent node (referenced by the property `parentNode`). For example, if the user clicks on a DOM node, then the browser builds a *propagation path* by going from the node that was the target of the click via the `parentNode` up to the root node (the HTML tag), which does not have a parent node assigned to propagation path. The browser uses the propagation path to dispatch the event to each of the nodes in it. First, in the *capture phase*, the chain is iterated from the root node (the HTML node) down to the target node (which the user has hit with it's click). Subsequently, in the *bubbling phase*, the event is dispatched to each node again, this time starting from the target node, working

www.EngineeringBooksPdf.com

back up to the root node. Thus, each node receives the event twice, once within the *capture phase* and once within the *bubbling phase*. Normally events are processed within the *bubbling phase*, but there might been reasons to process them in the *capture phase*, for example to stop the events from reaching other listeners, because all events can be stopped by any listener at any node within the propagation path.

The registered event listeners must be limited to specific event types either in the *capture phase* or the *bubbling phase*. Additionally, they can be registered for all events of a certain type or limited to events of a certain type that originate from a specific namespace (see *nokia.maps.dom.EventTarget#addListenerNS*). In the latter case, the listener is notified only if the `namespaceURI` of the event is set to the desired namespace. This can be used to separate arbitrary application events from other events, such as standard W3C events.

For a more comprehensive description of how events are dispatched, please the W3C documentation *DOM level 3 event flow*.

Constructor Details

`nokia.maps.dom.EventTarget(obj)`

The class constructor mixes the functionality of `EventTarget` into the argument object.

Parameters:

`obj`:	`{Object}`	
	The object to be extended with EventTarget functionality	

Property Details

`readonly` **`isDraggable`**`: {Boolean}`

This property indicates if the given event target is draggable and may receive a `dragstart`, `drag` and `dragend` events (`true`); `false` otherwise.

See: *nokia.maps.dom.EventTarget#enableDrag*
nokia.maps.dom.EventTarget#disableDrag

`readonly` **`isEventTarget`**`: {Boolean}`

This property indicates whether an object implements the *nokia.maps.dom.EventTarget* interface (`true`) or not (`false`).

www.EngineeringBooksPdf.com

parentNode: {*nokia.maps.dom.EventTarget*}

This property holds a reference to the parent node of the event target (if set).

parentNodes: {Object}

This property is designed to hold a hash table that contains the "namespaceURI" as key and the corresponding value is the parent node of the given event target. The use of the property is optional.

Method Details

addListener(type, callback, useCapture): {Object}

This method registers an event listener. The caller can specify whether the listener is to be invoked in the capture phase only or only in the target and bubbling phases.

Parameters:

type:	{String} A string providing the event type for which the listener is to be registered
callback:	{Function} The function to be called if the event occurs; the function receives the following argument: • (Event) evt - a reference to the fired event. See *nokia.maps.dom.Event*
useCapture:	{Boolean} A flag that indicates if the event listener is to be used for the capture phase only (true - the listerener is not invoked during the target and bubbling phases), or for target and bubbling phases (false)

Returns:

{Object}	A reference to the given nokia.maps.dom.EventTarget object

addListenerNS(namespaceURI, type, callback, useCapture): {*nokia.maps.dom.EventTarget*}

www.EngineeringBooksPdf.com

This method registers an event listener for events originating from a specific namespace. The caller can specify whether the listener is to be invoked in the capture phase only or only in the target and bubbling phases.

Parameters:

`namespaceURI`: `{String}`

A string specifying the `Event.namespaceURI` associated with the event for which the user is registering

`type`: `{String}`

A string specifying the event type for which the listener is to be registered

`callback`: `{Function}`

The function to be called if the event occurs; the function receives the following argument:

- (Event) evt - a reference to the fired event. See *nokia.maps.dom.Event*

`useCapture`: `{Boolean}`

A flag indicating if the event listener is to be used for the capture phase only (`true` - the listerener is not invoked during the target and bubbling phases), or for target and bubbling phases (`false`)

Returns:

{*nokia.maps.dom.EventTarget*}

A reference to the given event target object

`addListeners(obj)`

This method provides a means of registering multiple event listeners.

Parameters:

`obj`: `{Object}`

A hash map object where key is name of event and value is an array that contains callback function which should be called if the event occurs and

www.EngineeringBooksPdf.com

boolean value that indicates if the event listener have to be used only for the capture phase

```
{
"eventName": [callback, useCapture],
"eventName2": [callback, useCapture]
}
```

static catchException(enable)

This method enables exception catching in the event dispatcher to make it possible to ignore errors in event handlers or it disables exception catching in the event dispatcher for debugging purposes. By default, exceptions are caught and written to the debug console.

Parameters:

enable: {Boolean}

true to enable exception catching; false otherwise

disableDrag(): {*nokia.maps.dom.EventTarget*}

This method disables dragging of this event target, causing this event target not to receive dragstart, drag and dragend events.

Note that although enableDrag disables user selection, this method does not enable it.

Returns:

{*nokia.maps.dom.EventTarget*}

The event target itself

disableUserSelect(): {*nokia.maps.dom.EventTarget*}

This method prevents user selection of text and elements within the event target and prevents the magnifier on the iPhone or other similar mobile devices.

Note that if you wish to listen to the longpress event, you should disable the user selection, because otherwise the iPhone and other mobile devices may show a magnifier, making it harder for you to interpret the longpress event.

www.EngineeringBooksPdf.com

Returns:

{*nokia.maps.dom.EventTarget*}

The event target itself

dispatch(evt): {Boolean}

This method dispatches an event.

The default implementation depends on whether the event has a `namespaceURI` property set or not. If this property is not set, the default implementation searches for a parent object using the property `parentNode`.

If the event has `namespaceURI` set, then the property `parentNodes` is checked, which contains a hash table with "namespaceURI" as key and the parent object for this namespace as value. If no match is found using the "namespaceURI" mechanism, then the `parentNode` property is checked as an alternative parent.

Parameters:

evt:	{*nokia.maps.dom.Event* | Object} An object representing the event to be dispatched; it is either an instance of `nokia.maps.dom.Event` or a native browser event.

Returns:

{Boolean}	A flag indicating whether any of the listeners which handled the event called `Event.preventDefault()`. If `Event.preventDefault()` was called, the return value is `false`, otherwise it is `true`

static dispatchEvent(target, event, dispatchPath): {Boolean}

This method dispatches an event to the given event target.

The default implementation depends on whether the event has a `namespaceURI` property set or not. If this property is not set, then the default implementation searches for a parent object using the property `parentNode`.

If the event has `namespaceURI` set, then the property `parentNodes` is checked, which contains a hash table with "namespaceURI" as key and the parent object for this namespace as value. If no

www.EngineeringBooksPdf.com

match is found using the "namespaceURI" mechanism, then the `parentNode` property is checked as an alternative parent.

Parameters:

`target:`	{*`nokia.maps.dom.EventTarget`*} The event target to which the event is to be dispatched
`event:`	{*`nokia.maps.dom.Event`* | `Object`} The event to be dispatched; it is either a *`nokia.maps.dom.Event`* object or a native browser event
`dispatchPath:`	{`Node[]`} [optional] List of elements like from `nokia.maps.dom.EventTarget#getDispatchPath` method

Returns:

{`Boolean`}	A value indicating whether any of the listeners which have handled the event called `preventDefault`; if `preventDefault` was called `false` is returned, otherwise `true`

`enableDrag``(): {`*`nokia.maps.dom.EventTarget`*`}`

This method enables dragging of this event target and disables the user selection, allowing this event target to receive `dragstart`, `drag` and `dragend` events.

Returns:

{*`nokia.maps.dom.EventTarget`*}	The event target itself

`enableUserSelect``(): {`*`nokia.maps.dom.EventTarget`*`}`

This method allows the user to select text and elements within the event target and allows the magnifier on the iPhone or other similar mobile devices.

Returns:

www.EngineeringBooksPdf.com

{*nokia.maps.dom.EventTarget*}

The event target itself

hitTest(pageX, pageY): {Boolean}

This method tests if the given x/y position relative to the document lies within the outer bounding box of the node corresponding to the given `EventTarget` object.

If this object is not a DOM node, the method must be overloaded to ensure that `mouseleave` events are fired correctly.

Parameters:

`pageX`: `{Number}`

The horizontal position of the CSS pixel relative to the document to test.

`pageY`: `{Number}`

The vertical position of the CSS pixel relative to the document to test.

Returns:

`{Boolean}` `true` if the pixel lies within the node; `false` otherwise.

insertListener(type, callback, useCapture): {Object}

This method registers an event listener as the first listener in the listener chain. The caller can specified whether the listener is to be registered for the capture phase only, or for target and bubbling phases.

Parameters:

`type`: `{String}`

Specifies the event type for which the listener is to be registered

`callback`: `{Function}`

The function to be called if the event occurs; the function receives the following argument:

- (Event) evt - a reference to the fired event. See *nokia.maps.dom.Event*

www.EngineeringBooksPdf.com

`useCapture`: `{Boolean}`

Indicates if the event listener is to be used for the capture phase only (`true` - the listerener is not invoked during the target and bubbling phases), or for target and bubbling phases (`false`)

Returns:

`{Object}` A reference to the given `nokia.maps.dom.EventTarget` object

`insertListenerNS(namespaceURI, type, callback, useCapture): {nokia.maps.dom.EventTarget}`

This method registers an event listener for events originating from a specific namespace as the first in the listener chain. The caller can specify whether the listener is to be invoked in the capture phase only or only in the target and bubbling phases.

Parameters:

`namespaceURI`: `{String}`

A string specifying the `Event.namespaceURI` associated with the event for which the listener is to be registered

`type`: `{String}`

A string specifying the event type for which the listener is to be registered

`callback`: `{Function}`

The function to be called if the event occurs; the function receives the following argument:

- (Event) evt - a reference to the fired event. See *nokia.maps.dom.Event*

`useCapture`: `{Boolean}`

A flag indicating if the event listener is to be used for the capture phase only (`true` - the listerener is not invoked during the target and bubbling phases), or for target and bubbling phases (`false`)

Returns:

www.EngineeringBooksPdf.com

{*nokia.maps.dom.EventTarget*}

A reference to the given event target object

removeAllListeners()

This method remove all registered listeners from current EventTarget

removeListener(type, listener, useCapture): {*nokia.maps.dom.EventTarget*}

This method removes an event listener.

Parameters:

type: {String}

A string specifying the event type for which the listener was registered

listener: {Function}

The function to be removed

useCapture: {Boolean}

A flag indicating if the event listener was to be used for the capture phase only (`true` - the listener is not invoked during the target and bubbling phases), or for target and bubbling phases (`false`)

Returns:

{*nokia.maps.dom.EventTarget*}

A reference to the given event target object

removeListenerNS(namespaceURI, type, listener, useCapture): {*nokia.maps.dom.EventTarget*}

This method removes an event listener for events originating from a specific namespace.

Parameters:

namespaceURI: {String}

www.EngineeringBooksPdf.com

A string specifying the `Event.namespaceURI` associated with the event for which the listener was registered

`type:` `{String}`

A string specifying the event type for which the listener was registered

`listener:` `{Function}`

The function to be removed

`useCapture:` `{Boolean}`

A flag indicating if the event listener was to be used for the capture phase only (`true` - the listerener is not invoked during the target and bubbling phases), or for target and bubbling phases (`false`)

Returns:

{*nokia.maps.dom.EventTarget*}

A reference to the given event target object

Interface: FocusEvent

This interface is a member of ***nokia.maps.dom***.

Extends: *nokia.maps.dom.Event*

Interface Summary

This event is fired if a target receives or loses the focus.

[*For full details, see nokia.maps.dom.FocusEvent*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.dom.Event* :

AT_TARGET, *bubbles*, *BUBBLING_PHASE*, *canBubble*, *cancelable*, *canSicker*, *CAPTURING_PHASE*, *currentTarget*, *defaultPrevented*, *eventPhase*, *namespaceURI*, *nativeEvent*, *page*, *propagation*, *PROPAGATION_OK*, *PROPAGATION_STOP*, *PROPAGATION_STOP_IMMEDIATE*, *target*, *timeStamp*, *type*

www.EngineeringBooksPdf.com

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.dom.Event* :

cancel, *clone*, *preventDefault*, *preventUnload*, *stopImmediatePropagation*, *stopPropagation*

Interface Description

Event is fired when a target receives or loses the focus.

Note that this class represents an unimplemented interface. It is included here to document its properties. The class is derived from *nokia.maps.dom.Event*, but, in addition to the properties of the parent class, it has the properties described here.

Interface: FocusEventTarget

This interface is a member of ***`nokia.maps.dom`***.

Interface Summary

This class is a *virtual* interface that exists only for documentation purposes.

[*For full details, see nokia.maps.dom.FocusEventTarget*]

Table 37: Event Summary

Events
`blur`
This event is fired if a target has lost the focus.
`focus`
This event is fired when an event target has received the focus.
`focusin`
This event is fired before a target receives the focus.
`focusout`
This event is fired before a target is about to lose the focus.

www.EngineeringBooksPdf.com

Interface Description

Each class implementing this interface delcares that it can act as the target for certain events. Each event in this interface (and therefore also within the classes implementing the interface) represents an event of a specific type.

The following example shows event handling for events of the type "click":

```
// Note that "obj" can be either a DOM node or any other JavaScript object.
var obj = nokia.maps.dom.EventTarget( {} );
obj.addListener("click", function (evt) {
 console.log("This is the '"+evt.type+"' event!");
});

obj.dispatch( new nokia.maps.dom.Event({
 type: "click"
});
```

The example creates an instant of `nokia.maps.dom.EventTarget`, adds a listener for "click" events to it, and dispatches a "click" event to all registered listeners (in this case one) - the listeners receive the object that represents the target of the event.

For more information about dispatching events, please refer to the documentation of the *nokia.maps.dom.EventTarget*.

Event Details

`blur`

This event is fired if a target has lost the focus. The event is dispatched after the target has lost the focus.

Event Handler Parameters:	
evt	{*nokia.maps.dom.FocusEvent*} An object representing the event

`focus`

This event is fired when an event target has received the focus. The event is dispatched after the target has received the focus.

www.EngineeringBooksPdf.com

Event Handler Parameters:	
evt	{*nokia.maps.dom.FocusEvent*} An object representing the event

focusin

This event is fired before a target receives the focus. The event is dispatched before the target receives the focus.

Event Handler Parameters:	
evt	{*nokia.maps.dom.FocusEvent*} An object representing the event

focusout

This event is fired before a target is about to lose the focus. The event is dispatched before the target loses the focus.

Event Handler Parameters:	
evt	{*nokia.maps.dom.FocusEvent*} An object representing the event

Interface: KeyboardEvent

This interface is a member of ***nokia.maps.dom***.

Extends: *nokia.maps.dom.Event*

Interface Summary

This event is fired when a keyboard key is pressed or released.

[*For full details, see nokia.maps.dom.KeyboardEvent*]

www.EngineeringBooksPdf.com

Table 38: Property Summary

Properties
altKey: {Boolean} This property indicates if the Alt key modifier is activated (`true`) or not (`false`).
ctrlKey: {Boolean} This property indicates if the control (Ctrl) was used as a key modifier (`true`) or not (`false`).
`readonly` ***DOM_KEY_LOCATION_JOYSTICK***: {Number} This field is an identifier indicating that the key activation originated on a game controller or a joystick on a mobile device.
`readonly` ***DOM_KEY_LOCATION_LEFT***: {Number} This field is an identifier indicating that the activated key was a left-hand-side key (there is more than one possible location for this key).
`readonly` ***DOM_KEY_LOCATION_MOBILE***: {Number} This field is an identifier indicating that the key activation originated on a mobile device, either on a physical keypad or a virtual keyboard.
`readonly` ***DOM_KEY_LOCATION_NUMPAD***: {Number} This field is an identifier indicating that the key activation originated on the numeric keypad or with a virtual key corresponding to the numeric keypad.
`readonly` ***DOM_KEY_LOCATION_RIGHT***: {Number} This field is an identifier indicating that the the activated key was a right-hand-side key (there is more than one possible location for this key).
`readonly` ***DOM_KEY_LOCATION_STANDARD***: {Number} This field is an identifier indicating that a standard key was pressed, no distinction is made between the left or right version of the key, and the key did not originate from the numeric keypad (or did not originate from a virtual key corresponding to the numeric keypad).
getModifierState: {Boolean} This method queries the state of a key modifier.
keyIdentifier: {String} This property holds the identifier of the activated (pressed) key.
keyLocation: {Number} This property indicates the location of the key that was pressed on the device, as described in Keyboard event types.
metaKey: {Boolean} This property indicates if the Meta key modifier is activated (`true`) or not (`false`).
repeat: {Boolean}

www.EngineeringBooksPdf.com

Properties
This property indicates if a key has been pressed repeatedly or has been held down to generate repeated key strokes (`true`).
shiftKey: {Boolean}
This property indicates if the shift (Shift) key modifier is activated (`true`) or not (`false`).

Directly Inherited Properties

Inherited from class *nokia.maps.dom.Event* :

AT_TARGET, *bubbles*, *BUBBLING_PHASE*, *canBubble*, *cancelable*, *canSicker*, *CAPTURING_PHASE*, *currentTarget*, *defaultPrevented*, *eventPhase*, *namespaceURI*, *nativeEvent*, *page*, *propagation*, *PROPAGATION_OK*, *PROPAGATION_STOP*, *PROPAGATION_STOP_IMMEDIATE*, *target*, *timeStamp*, *type*

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.dom.Event* :

cancel, *clone*, *preventDefault*, *preventUnload*, *stopImmediatePropagation*, *stopPropagation*

Interface Description

This event is fired if a key on the keyboard is pressed or released.

Note that this class represents an unimplemented interface. It is included here to document its properties. The class is derived from *nokia.maps.dom.Event*, but, in addition to the properties of the parent class, it has the properties described here.

Property Details

altKey: {Boolean}

This property indicates if the Alt key modifier is activated (`true`) or not (`false`).

ctrlKey: {Boolean}

This property indicates if the control (Ctrl) was used as a key modifier (`true`) or not (`false`).

readonly **DOM_KEY_LOCATION_JOYSTICK**: {Number}

www.EngineeringBooksPdf.com

This field is an identifier indicating that the key activation originated on a game controller or a joystick on a mobile device. Example: the 'DownLeft' key on a game controller.

`readonly` **`DOM_KEY_LOCATION_LEFT`**`: {Number}`

This field is an identifier indicating that the activated key was a left-hand-side key (there is more than one possible location for this key). Example: the left 'Control' key on a PC 101 Key US keyboard.

`readonly` **`DOM_KEY_LOCATION_MOBILE`**`: {Number}`

This field is an identifier indicating that the key activation originated on a mobile device, either on a physical keypad or a virtual keyboard. Example: the '#' key or softkey on a mobile device.

`readonly` **`DOM_KEY_LOCATION_NUMPAD`**`: {Number}`

This field is an identifier indicating that the key activation originated on the numeric keypad or with a virtual key corresponding to the numeric keypad. Example: the '1' key on a PC 101 Key US keyboard located on the numeric pad.

`readonly` **`DOM_KEY_LOCATION_RIGHT`**`: {Number}`

This field is an identifier indicating that the the activated key was a right-hand-side key (there is more than one possible location for this key). Example: the right 'Shift' key on a PC 101 Key US keyboard.

`readonly` **`DOM_KEY_LOCATION_STANDARD`**`: {Number}`

This field is an identifier indicating that a standard key was pressed, no distinction is made between the left or right version of the key, and the key did not originate from the numeric keypad (or did not originate from a virtual key corresponding to the numeric keypad). Example: the 'Q' key on a PC 101 Key US keyboard.

`getModifierState``: {Boolean}`

This method queries the state of a key modifier.

`keyIdentifier``: {String}`

www.EngineeringBooksPdf.com

This property holds the identifier of the activated (pressed) key. The key identifiers are defined in the Key identifiers set. Implementations that are unable to identify a key must use the key identifier 'Unidentified'.

`keyLocation`: `{Number}`

This property indicates the location of the key that was pressed on the device, as described in Keyboard event types.

`metaKey`: `{Boolean}`

This property indicates if the Meta key modifier is activated (`true`) or not (`false`).

`repeat`: `{Boolean}`

This property indicates if a key has been pressed repeatedly or has been held down to generate repeated key strokes (`true`). Depending on the system configuration, holding down a key may result in multiple consecutive keydown events, keypress events, and textInput events, for appropriate keys. For mobile devices which have long-key-press behavior, the first key event with a repeat attribute value of `true` indicates a long-key-press. The length of time that the key must be pressed in order to begin repeating is configuration dependent.

`shiftKey`: `{Boolean}`

This property indicates if the shift (Shift) key modifier is activated (`true`) or not (`false`).

Interface: KeyboardEventTarget

This interface is a member of ***`nokia.maps.dom`***.

Interface Summary

This class is a *virtual* interface that does exist for documentation purposes.

[*For full details, see nokia.maps.dom.KeyboardEventTarget*]

www.EngineeringBooksPdf.com

Table 39: Event Summary

Events
keydown
This event is fired if a key is pressed and delivered to the node that currently has the focus.
keyup
This event is fired if a key is released and delivered to the node that currently has the focus.

Interface Description

Each class implementing this interface delcares that it can act as the target for certain events. Each event in this interface (and therefore also within the classes implementing the interface) represents an event of a specific type.

The following example shows event handling for events of the type "click":

```
// Note that "obj" can be either a DOM node or any other JavaScript object.
var obj = nokia.maps.dom.EventTarget( {} );
obj.addListener("click", function (evt) {
 console.log("This is the '"+evt.type+"' event!");
});

obj.dispatch( new nokia.maps.dom.Event({
 type: "click"
});
```

The example creates an instant of `nokia.maps.dom.EventTarget`, adds a listener for "click" events to it, and dispatches a "click" event to all registered listeners (in this case one) - the listeners receive the object that represents the target of the event.

For more information about dispatching events, please refer to the documentation of the *nokia.maps.dom.EventTarget*.

Event Details

keydown

This event is fired if a key is pressed and delivered to the node that currently has the focus.

Event Handler Parameters:

`evt`	{*`nokia.maps.dom.KeyboardEvent`*} An object representing the event

www.EngineeringBooksPdf.com

keyup

This event is fired if a key is released and delivered to the node that currently has the focus.

Event Handler Parameters:	
evt	{*nokia.maps.dom.KeyboardEvent*} An object representing the event

Interface: MouseEvent

This interface is a member of ***nokia.maps.dom***.

Extends: *nokia.maps.dom.Event*

Interface Summary

This event is fired for all mouse related events like moves, clicks, etc.

[*For full details, see nokia.maps.dom.MouseEvent*]

Table 40: Property Summary

Properties
altKey: {Boolean} This field indicates the activation state of the modifier key Alt.
button: {Number} This property holds the numeric id of a mouse button that has changed state, because it was pressed or released.
buttonState: {Number} This property holds the current state of all mouse buttons.
clientX: {Number} The horizontal coordinate at which the event occurred relative to the viewport associated with the event.
clientY: {Number} The vertical coordinate at which the event occurred relative to the viewport associated with the event.
ctrlKey: {Boolean} This field indicates the activation state of the modifier key Ctrl.

www.EngineeringBooksPdf.com

Properties
getModifierState: {Boolean} This method queries the state of a modifier on the basis of the key identifier supplied by the caller.
metaKey: {Boolean} This field indicates the activation state of the modifier key Meta.
pageX: {Number} The horizontal coordinate at which the event occurred relative to the document associated with the event.
pageY: {Number} The vertical coordinate at which the event occurred relative to the document associated with the event.
relatedTarget: {*nokia.maps.dom.EventTarget*} This property identifies a secondary event target related to a UI event, depending on the type of event: • `mouseover` event - the property refers to the target over which the mouse pointer or finger is has begun to pass or has passed, if available • `mouseout` event - the property contains the reference to the target which the mouse is leaving, if available • `drag` event - the property refers to the target that located below the mouse pointer or finger, if available • `dragenter`, `dragleave` or `drop` event - the property contains the reference to the event target that is currently being dragged (in other words, the target of the `dragstart` event) • `dragend` event - the property refers to the event target on which the dragged object has been dropped successfully; if the drop failed for any reason the property is `null` Therefore, this property only holds information relevant for `mouseover`, `mouseout`, `drag`, `dragenter`, `dragleave`, `drop` or `dragend` events; otherwise it is `null`.
screenX: {Number} The horizontal coordinate at which the event occurred relative to the origin of the screen coordinate system.
screenY: {Number} The vertical coordinate at which the event occurred relative to the origin of the screen coordinate system.
shiftKey: {Boolean} This field indicates the activation state of the modifier key Shift.
targetX: {Number} The x-position of the cursor relative to the target.
targetY: {Number} The y-position of the cursor relative to the target.

Directly Inherited Properties

Inherited from class *nokia.maps.dom.Event* :

www.EngineeringBooksPdf.com

AT_TARGET, *bubbles*, *BUBBLING_PHASE*, *canBubble*, *cancelable*, *canSicker*, *CAPTURING_PHASE*, *currentTarget*, *defaultPrevented*, *eventPhase*, *namespaceURI*, *nativeEvent*, *page*, *propagation*, *PROPAGATION_OK*, *PROPAGATION_STOP*, *PROPAGATION_STOP_IMMEDIATE*, *target*, *timeStamp*, *type*

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.dom.Event* :

cancel, *clone*, *preventDefault*, *preventUnload*, *stopImmediatePropagation*, *stopPropagation*

Interface Description

This class represents all mouse-related events.

Note that this class represents an unimplemented interface. It is included here to document its properties. The class is derived from *nokia.maps.dom.Event*, but, in addition to the properties of the parent class, it has the properties described here.

Property Details

`altKey`: `{Boolean}`

This field indicates the activation state of the modifier key Alt. It is set to `true` if the modifier is activated.

`button`: `{Number}`

This property holds the numeric id of a mouse button that has changed state, because it was pressed or released.

- 0 - indicates the normal button of the mouse that is used to click on user interface buttons and menu items or to select text (in general this is the left mouse button or the one button on a Macintosh mouse)
- 2 - indicates the contextual property button of the mouse if present (normally, this means the right mouse button that is used to display a context menu)
- 1 - indicates the extra button (typically, the middle button, which is often combined with the mouse wheel)
- values higher than 2 - indicate other mouse buttons that may be present or simulated on some mouse devices

www.EngineeringBooksPdf.com

buttonState: {Number}

This property holds the current state of all mouse buttons.

This property is a bitmask where bit zero represents the state of the left mouse button, bit one the state of the middle mouse button, bit two the state of the right mouse button and bit three and higher the state of any further mouse buttons that may be present or simulated. This state is set for all events. You can detect if a specific button has been pressed, like this: `if (event.buttonState & (1 << button)) ...`, where `button` is the identifier as defined by the W3C (zero for the left button, one for the middle button, two for the right button and three, etc. for further buttons).

Note that within a "mouseup" event, the value of this property is up-to-date. For example, while the `button` property may be set to 1 to indicate that the middle button has been released, bit one in the `buttonState` property is already cleared as the button has already been released.

This is a proprietary member and not part of the W3C interface specification this class implements.

clientX: {Number}

The horizontal coordinate at which the event occurred relative to the viewport associated with the event.

clientY: {Number}

The vertical coordinate at which the event occurred relative to the viewport associated with the event.

ctrlKey: {Boolean}

This field indicates the activation state of the modifier key Ctrl. It is set to `true` if the modifier is activated.

getModifierState: {Boolean}

This method queries the state of a modifier on the basis of the key identifier supplied by the caller.

metaKey: {Boolean}

www.EngineeringBooksPdf.com

This field indicates the activation state of the modifier key Meta. It is set to `true` if the modifier is activated.

`pageX`: `{Number}`

The horizontal coordinate at which the event occurred relative to the document associated with the event.

This is a proprietary member and not part of the W3C interface specification this class implements.

`pageY`: `{Number}`

The vertical coordinate at which the event occurred relative to the document associated with the event.

This is a proprietary member and not part of the W3C interface specification this class implements.

`relatedTarget`: `{nokia.maps.dom.EventTarget}`

This property identifies a secondary event target related to a UI event, depending on the type of event:

- `mouseover` event - the property refers to the target over which the mouse pointer or finger is has begun to pass or has passed, if available
- `mouseout` event - the property contains the reference to the target which the mouse is leaving, if available
- `drag` event - the property refers to the target that located below the mouse pointer or finger, if available
- `dragenter`, `dragleave` or `drop` event - the property contains the reference to the event target that is currently being dragged (in other words, the target of the `dragstart` event)
- `dragend` event - the property refers to the event target on which the dragged object has been dropped successfully; if the drop failed for any reason the property is `null`

Therefore, this property only holds information relevant for `mouseover`, `mouseout`, `drag`, `dragenter`, `dragleave`, `drop` or `dragend` events; otherwise it is `null`.

Note that in a drag operation the property `reltatedTarget` always contains the necessary counterpart of the event, but only for simulated events, not for native drag events.

www.EngineeringBooksPdf.com

screenX: {Number}

The horizontal coordinate at which the event occurred relative to the origin of the screen coordinate system.

screenY: {Number}

The vertical coordinate at which the event occurred relative to the origin of the screen coordinate system.

shiftKey: {Boolean}

This field indicates the activation state of the modifier key Shift. It is set to `true` if the modifier is activated.

targetX: {Number}

The x-position of the cursor relative to the target.

This is a proprietary member and not part of the W3C interface specification this class implements.

targetY: {Number}

The y-position of the cursor relative to the target.

This is a proprietary member and not part of the W3C interface specification this class implements.

Interface: MouseEventTarget

This interface is a member of ***nokia.maps.dom***.

Interface Summary

This class is a *virtual* interface that does exist for documentation purposes.

[*For full details, see nokia.maps.dom.MouseEventTarget*]

Table 41: Event Summary

Events
click

www.EngineeringBooksPdf.com

Events
This event is fired after a mousedown/mouseup sequence at the same target has occurred.
dblclick
This event is fired after two click events have been fired within a certain time period.
longpress
This event is fired after a mouse button has been pressed for a certain amount of time without starting a drag.
mousedown
This event is fired if a mouse button has been pressed.
mouseenter
This event is fired if the mouse cursor enters the visible area of a node -- it is fired at the node that the mouse has entered.
mouseleave
This event is fired when the mouse cursor leaves the physical area of a node -- it is fired at the node the mouse has left.
mousemove
This event is fired if the mouse is moved.
mouseout
This event is fired if the mouse cursor leaves the visible area of a node -- the event is fired at the node that the mouse has left.
mouseover
This event is fired when the mouse cursor enters the visible area of a node -- the event is fired at the node that is entered.
mouseup
This event is fired if a mouse button has been released.
mousewheel
This event is fired if the mousewheel is moved.

Interface Description

Each class implementing this interface delcares that it can act as the target for certain events. Each event in this interface (and therefore also within the classes implementing the interface) represents an event of a specific type.

The following example shows event handling for events of the type "click":

```
// Note that "obj" can be either a DOM node or any other JavaScript object.
var obj = nokia.maps.dom.EventTarget( {} );
obj.addListener("click", function (evt) {
```

www.EngineeringBooksPdf.com

```
 console.log("This is the '"+evt.type+"' event!");
});

obj.dispatch( new nokia.maps.dom.Event({
 type: "click"
});
```

The example creates an instant of `nokia.maps.dom.EventTarget`, adds a listener for "click" events to it, and dispatches a "click" event to all registered listeners (in this case one) - the listeners receive the object that represents the target of the event.

For more information about dispatching events, please refer to the documentation of the *nokia.maps.dom.EventTarget*.

Event Details

`click`

This event is fired after a mousedown/mouseup sequence at the same target has occurred.

Event Handler Parameters:	
evt	{*nokia.maps.dom.MouseEvent*} An object representing the event

`dblclick`

This event is fired after two click events have been fired within a certain time period.

Event Handler Parameters:	
evt	{*nokia.maps.dom.MouseEvent*} An object representing the event

`longpress`

This event is fired after a mouse button has been pressed for a certain amount of time without starting a drag.

Event Handler Parameters:	

www.EngineeringBooksPdf.com

evt	{*nokia.maps.dom.MouseEvent*} An object representing the event

mousedown

This event is fired if a mouse button has been pressed.

Event Handler Parameters:

evt	{*nokia.maps.dom.MouseEvent*} An object representing the event

mouseenter

This event is fired if the mouse cursor enters the visible area of a node -- it is fired at the node that the mouse has entered.

The difference between the `mouseenter` and `mouseleave` events compared to the `mouseover` and `mouseout` events is that there can be multiple `mouseenter` events without even one `mouseleave` event. This happens, for example, if you have a with the size of 100 x 100 pixels that contains a centered image measuring 50 x 50 pixels. When the mouse cursor enters the outer , the receives a `mouseover` and a `mouseenter` event (note that the order is not guaranteed). However, if the mouse cursor now moves over the image, the outer receives a `mouseout` event, because the mouse is no longer within its visual area, and now the image gets a `mouseover` event. Additionally, the image receives a `mouseenter` event, but the outer does not get a `mouseleave` event, because the mouse has not left the physical area of the outer .

The `mouseenter` and `mouseleave` events are very useful, for example, when building tooltips that are to apear below the mouse cursor or when showing overlay information as long as the mouse cursor is above a specific area that contains child nodes.

Event Handler Parameters:

evt	{*nokia.maps.dom.MouseEvent*} An object representing the event

www.EngineeringBooksPdf.com

mouseleave

This event is fired when the mouse cursor leaves the physical area of a node -- it is fired at the node the mouse has left.

The difference between the `mouseenter` and `mouseleave` events compared to the `mouseover` and `mouseout` events is that there can be multiple `mouseenter` events without even one `mouseleave` event. This happens, for example, if you have a with the size of 100 x 100 pixels that contains a centered image measuring 50 x 50 pixels. When the mouse cursor enters the outer , the receives a `mouseover` and a `mouseenter` event (note that the order is not guaranteed). However, if the mouse cursor now moves over the image, the outer receives a `mouseout` event, because the mouse is no longer within its visual area, and now the image gets a `mouseover` event. Additionally, the image receives a `mouseenter` event, but the outer does not get a `mouseleave` event, because the mouse has not left the physical area of the outer .

The `mouseenter` and `mouseleave` events are very useful, for example, when building tooltips that are to apear below the mouse cursor or when showing overlay information as long as the mouse cursor is above a specific area that contains child nodes.

Event Handler Parameters:	
`evt`	{*`nokia.maps.dom.MouseEvent`*} An object representing the event

mousemove

This event is fired if the mouse is moved.

Event Handler Parameters:	
`evt`	{*`nokia.maps.dom.MouseEvent`*} An object representing the event

mouseout

This event is fired if the mouse cursor leaves the visible area of a node -- the event is fired at the node that the mouse has left.

www.EngineeringBooksPdf.com

Event Handler Parameters:	
evt	{*nokia.maps.dom.MouseEvent*} An object representing the event

mouseover

This event is fired when the mouse cursor enters the visible area of a node -- the event is fired at the node that is entered.

Event Handler Parameters:	
evt	{*nokia.maps.dom.MouseEvent*} An object representing the event

mouseup

This event is fired if a mouse button has been released.

Event Handler Parameters:	
evt	{*nokia.maps.dom.MouseEvent*} An object representing the event

mousewheel

This event is fired if the mousewheel is moved.

Event Handler Parameters:	
evt	{*nokia.maps.dom.WheelEvent*} An object representing the event

www.EngineeringBooksPdf.com

Class: Page

This class is a member of ***nokia.maps.dom***.

Class Summary

This class defines a mixin which extends given DOM node.

[*For full details, see nokia.maps.dom.Page*]

Table 42: Property Summary

Properties
`readonly` ***body***`: {Element}` This property holds a reference to the body element of the document of this page.
`static` ***browser***`:` This static object reflects details of the current browser and user interface.
`readonly` ***document***`: {document}` This property holds a reference to the document that is rendered into the window refernced by `window` and to which the given instance of the page class is bound.
`readonly` ***documentMode***`: {Number}` This property is undefined unless the current browser is Microsoft Internet Explorer.
`static` ***DOUBLE_CLICK_TIME***`: {Number}` The time in milliseconds between two "click" events that raises a "dblclick" event.
`static` ***DOUBLE_TAP_TIME***`: {Number}` The time in milliseconds between two "tap" events that raises a "dbltap" event.
`readonly` ***head***`: {Element}` This property holds a reference to the head element of the document of this page.
`readonly` ***height***`: {Number}` This property indicates the height of the document in CSS pixels.
`readonly` ***html***`: {Element}` This property holds a reference to the HTML element of the document of this page.
`readonly` ***layoutHeight***`: {Number}` This property indicates the layout height, which is space measured in CSS pixels into which the document is rendered, without scrollbars.

www.EngineeringBooksPdf.com

Properties
`readonly` ***layoutWidth***: {Number} This property indicates the layout width as space measured in CSS pixels into which the document is rendered, without scrollbars.
`static` ***LONGPRESS_INTERVAL***: {Number} The interval in milliseconds after which a "longpress" event is fired if a button is pressed down.
`static` ***MOUSEMOVE_THRESHOLD***: {Number} The minimum delay (in milliseconds) after a mousemove event has been fired during which no further mousemove events are fired.
`readonly` ***orientation***: {Number} This property holds the current orientation of the layout viewport (not of the document).
`static` ***platform***: This static object holds information about the current platform (operating system, mobile device, etc.
`readonly` ***quirksMode***: {Boolean} This property is set to `true` if the document is rendered in quirks mode; `false` if rendered in CSS compatibility mode.
`static` ***RESIZE_IDL_TIME***: {Number} A number of milliseconds that a node must be not resized before the "resizeend" event is fired.
`static` ***RESIZE_SLEEP_MAX_TIME***: {Number} The maximum time in milliseconds to wait until the watched DOM nodes are checked again for a resize.
`static` ***RESIZE_SLEEP_MIN_TIME***: {Number} The minimum time in milliseconds to wait after a "resizestart" event before the watched DOM nodes are re-checked (to determine whether the resize has been completed and the "resizeend" event can be fired).
`readonly` ***scrollbarsHeight***: {Number} This property indicates the height of a vertical scrollbar in device pixels.
`readonly` ***scrollbarsWidth***: {Number} This property indicates the width of a vertical scrollbar in device pixels.
`readonly` ***viewportHeight***: {Number} This property indicates the viewport height, which is space available to render the layout measured in device pixels.
`readonly` ***viewportWidth***: {Number} This property indicates the viewport width, which is space available to render the layout measured in device pixels.
`readonly` ***width***: {Number} This property indicates the width of the document in CSS pixels.

www.EngineeringBooksPdf.com

Properties
`readonly` ***window***`: {window}`
This property holds a reference to the window in which the document is rendered.

Table 43: Method Summary

Methods
altKeyDown `() : {Boolean}`
This method checks if the Alt key is currently pressed.
createElement `(tagName, style) : {Node}`
This method creates a new DOM node and sets the style properties to use the values supplied by the caller.
ctrlKeyDown `() : {Boolean}`
This method checks if the Ctrl key is currently pressed.
getClientRect `(node) : {Object}`
This method calculates the absolute position of a node relative to the document.
metaKeyDown `() : {Boolean}`
This method checks if the Meta key is currently pressed.
`static` ***parseEvent*** `(e) : {`*`nokia.maps.dom.Event`*`}`
This method parses the given native event and returns a corresponding normalized event object.
setStyle `(node, style) : {Node}`
This method copies style properties into the style of the given DOM node.
shiftKeyDown `() : {Boolean}`
This method checks if the Shift key is currently pressed.
update `() : {`*`nokia.maps.dom.Page`*`}`
This method updates all volatile properties of the page (e.g.

Class Description

This class defines a mixin that provides a common API for documents. To get an object that implements the page behavior, simply pass a document or a DOM node to the constructor as shown in the examples below:

```
// Query page support for the document.
var page = nokia.maps.dom.Page(document);
```

www.EngineeringBooksPdf.com

```
// Query page support for the document of a DOM node.
var node = document.getElementById("foo");
page = nokia.maps.dom.Page(node);
```

The mixin defines a large number of helper methods and enables *nokia.maps.dom*-aligned event handling for all DOM nodes attached to the document. Therefore, we recommend that you get a Page object for any document whose nodes are to be event targets (*nokia.maps.dom.EventTarget*) at least once.

Note that unlike *nokia.maps.dom.EventTarget*, Page does not modify DOM nodes to which it is applied and attaches only one property to the document ($jslPage). This is why you must obtain an object implementing Page at least once for every document or DOM node.

Obtaining a Page object is very fast, except the first time, when the object must be created and bound to the document, which means that certain listeners must be registered with the document and some methods are created internally.

Details

The DOM package facilitates cross-browser event handling, simplifies the creation of custom events, offers access to information about the browser and the operating system, and provides a set of helper methods.

The package consists of the four main classes *nokia.maps.dom.Page*, *nokia.maps.dom.Event*, *nokia.maps.dom.EventTarget* and *nokia.maps.dom.DataTransfer*. *nokia.maps.dom.Page* can be considered an entry-point class here. It offers an abstraction of native browser events and most of the functionality in the package. The other classes are chiefly helper classes. The package offers cross-browser W3C-standards-compliant event handling and support for de facto standards for touch and gesture events.

The supported events and their meaning are documented within the different abstract pseudo event target classes:

- *nokia.maps.dom.TouchEventTarget*
- *nokia.maps.dom.DragEventTarget*
- *nokia.maps.dom.MouseEventTarget*
- *nokia.maps.dom.KeyboardEventTarget*
- *nokia.maps.dom.FocusEventTarget*

Note that these interfaces are defined here for documentation purposes only. They are referred to in the documentation for specific classes to show which events instances of those classes support. However, the design of event handling makes it possible for an object to receive additional undocumented events.

Event handling

www.EngineeringBooksPdf.com

Event handling itself is very simple and mostly W3C compatible, but it must be activated for native DOM nodes before it can be used. The reason is to prevent collisions with other frameworks that may be used together with this API. To add support for *aligned events* to a DOM node the interface `nokia.maps.dom.EventTarget` must be applied to the DOM node. This can be done simply by casting the DOM node into an `nokia.maps.dom.EventTarget` as the following example shows:

```
// Create a few shortcuts.
var Page = nokia.maps.dom.Page,
EventTarget = nokia.maps.dom.EventTarget;

// Query page support for the document. This is very important, but needs
 only
// to be done once.
Page(document);

// Attach EventTarget interface to the document to allow aligned events in
 the
// document.
EventTarget(document);

// Add a listener for the click event to the document and show an alert,
// if the document is clicked.
document.addListener("click", function (evt) {
alert(evt.type);

// Remove the listener so that an alert is shown only once.
document.removeListener("click", arguments.callee, false);
 }, false);
```

Most of the events are quite selfexplanatory and the syntax to register or unregister listeners is simlar to the W3C standard methods `addEventListener`, `removeEventListener` and `dispatchEvent`, except that the aligned methods are named `addListener`, `removeListener` and `dispatch` (these names do not contain the word "event").

Constructor Details

`nokia.maps.dom.Page(element)`

The constructor mixes the functionality of `Page` into the argument element.

Parameters:

`element:`	`{HtmlElement}`	- the document or element to be extended with Page functionality

www.EngineeringBooksPdf.com

Property Details

`readonly` **`body`**`: {Element}`

This property holds a reference to the `body` element of the document of this page.

`static` **`browser`**`:`

This static object reflects details of the current browser and user interface. The object includes the following fields -- if one of these fields is set, the corresponding browser/interface has been detected:

- {String} version - this property holds the version number of the current browser as a string convertible into a number (e.g. "4.0")
- {Number} realVersion - this property holds the real major version of the browser; for IE this property may hold a different value from `version`, because when, for example, IE 9 simulates IE 8, `realVersion` contains "9", while `version` is "8.0"; `realVersion` can be used to work around a bug in the VML implementation of IE 8 which is not present in IE 9 (even if it runs in IE 8 compatibility mode)
- {String} fullVersion - this property holds the full version number of the current browser as a string which is not convertible to a number (e.g. "4.0.1")
- {String} engineVersion - this property holds the version number of the rendering engine of the browser as a string
- {Boolean} chrome - this property indicates if the current browser is Chrome
- {Boolean} safari - this property indicates if the current browser is Safari
- {Boolean} opera - this property indicates if the current browser is Opera
- {Boolean} msie - this property indicates if the current browser is Internet Explorer
- {Boolean} mozilla - this property indicates if the current browser is a Mozilla browser
- {Boolean} konqueror - this property indicates if the current browser is a Konqueror browser
- {Boolean} camino - this property indicates if the current browser is a Camino browser
- {Boolean} webkit - this property indicates if the current browser uses the WebKit rendering engine
- {Boolean} gecko - this property indicates if the current browser uses the Gecko rendering engine
- {Boolean} dnd - this property indicates if the browser supports native HTML 5 drag and drop
- {Boolean} touch - this property indicates if the touch interface is in use
- {Boolean} mobile - this property indicates if a mobile web browser is in use
- {Boolean} web - this property indicates if a desktop web browser is in use

www.EngineeringBooksPdf.com

- {String} language - this property holds the language of the browser as a string, for example "en-GB"

For example, to check if the current browser is from the Mozilla family, you can use the following code:

```
if (nokia.maps.dom.Page.browser.mozilla) {
  // code applicable to Mozilla here
} else {
  // Code for non-Mozilla browsers here
}
```

`readonly` **`document`**`: {document}`

This property holds a reference to the document that is rendered into the window refernced by `window` and to which the given instance of the page class is bound.

`readonly` **`documentMode`**`: {Number}`

This property is undefined unless the current browser is Microsoft Internet Explorer. In that case it contains the document mode in which the document of this page is rendered, with the possible values of 5 (quirks mode, IE 5 compatible), 7 (IE 6/7 standard compliant mode), 8 (IE 8 standard compliant mode) or 9 (IE 9 HTML 5 mode).

`static` **`DOUBLE_CLICK_TIME`**`: {Number}`

The time in milliseconds between two "click" events that raises a "dblclick" event. This property is used only for browsers that do not fire native double click events or where there are no double click events under specific circumstances (browser bugs). For example, Chrome does not fire a right mouse button double-click event at all.

`static` **`DOUBLE_TAP_TIME`**`: {Number}`

The time in milliseconds between two "tap" events that raises a "dbltap" event.

`readonly` **`head`**`: {Element}`

This property holds a reference to the `head` element of the document of this page.

www.EngineeringBooksPdf.com

`readonly` **`height`**`: {Number}`

This property indicates the height of the document in CSS pixels. It is available in all browsers.

`readonly` **`html`**`: {Element}`

This property holds a reference to the HTML element of the document of this page.

`readonly` **`layoutHeight`**`: {Number}`

This property indicates the layout height, which is space measured in CSS pixels into which the document is rendered, without scrollbars.

`readonly` **`layoutWidth`**`: {Number}`

This property indicates the layout width as space measured in CSS pixels into which the document is rendered, without scrollbars.

`static` **`LONGPRESS_INTERVAL`**`: {Number}`

The interval in milliseconds after which a "longpress" event is fired if a button is pressed down.

`static` **`MOUSEMOVE_THRESHOLD`**`: {Number}`

The minimum delay (in milliseconds) after a mousemove event has been fired during which no further mousemove events are fired. If set to zero or less mousemove event will be fired in near time (so as soon as possible after they occurred, but asynchronously).

`readonly` **`orientation`**`: {Number}`

This property holds the current orientation of the layout viewport (not of the document).

The rotation is in degrees clockwise: a value of 0 indicates portrait mode with a normal device screen; 90 indicates landscape mode, with the device screen rotated 90 degrees clockwise; 180 is portrait mode, with the device screen rotated 180 degrees clockwise; and finally 270 degrees means the device screen is in landscape mode with the screen rotated 270 degrees clockwise.

Note that these values differ from those reported natively (for example by the iPhone), but they are easier to handle for developers as they refer simply the clockwise rotation.

www.EngineeringBooksPdf.com

`static` **`platform`**:

This static object holds information about the current platform (operating system, mobile device, etc.) The object includes the following properties:

- {Boolean} windows - this property indicates if the current operating system is Windows
- {Boolean} mac - this property indicates if the current platform/operating system is Mac OS X
- {Boolean} linux - this property indicates if the current operating system is Linux (but not Maemo)
- {Boolean} maemo - this property indicates if the current operating system is Maemo
- {Boolean} meego - this property indicates if the current platform is Meego
- {Boolean} android - this property indicates if the current platform is Android
- {Boolean} iphone - this property indicates if the current platform is iPhone touch device
- {Boolean} ipad - this property indicates if the current platform is iPad touch device
- {Boolean} windowsphone - this property indicates if the current platform is Windows Phone device

For example, to check if the operating system is Linux, you can use the following code:

```
if (nokia.maps.dom.Page.platform.linux) {
  // code applicable to Linux here
} else {
  // non-Linux code here
}
```

`readonly` **`quirksMode`**: {Boolean}

This property is set to `true` if the document is rendered in quirks mode; `false` if rendered in CSS compatibility mode.

`static` **`RESIZE_IDL_TIME`**: {Number}

A number of milliseconds that a node must be not resized before the "resizeend" event is fired.

`static` **`RESIZE_SLEEP_MAX_TIME`**: {Number}

The maximum time in milliseconds to wait until the watched DOM nodes are checked again for a resize.

www.EngineeringBooksPdf.com

`static` **`RESIZE_SLEEP_MIN_TIME`**`: {Number}`

The minimum time in milliseconds to wait after a "resizestart" event before the watched DOM nodes are re-checked (to determine whether the resize has been completed and the "resizeend" event can be fired).

`readonly` **`scrollbarsHeight`**`: {Number}`

This property indicates the height of a vertical scrollbar in device pixels.

`readonly` **`scrollbarsWidth`**`: {Number}`

This property indicates the width of a vertical scrollbar in device pixels.

`readonly` **`viewportHeight`**`: {Number}`

This property indicates the viewport height, which is space available to render the layout measured in device pixels.

`readonly` **`viewportWidth`**`: {Number}`

This property indicates the viewport width, which is space available to render the layout measured in device pixels.

`readonly` **`width`**`: {Number}`

This property indicates the width of the document in CSS pixels. The property is valid only for WebKit-based browsers like Safari and Chrome. If the width of the document cannot be detected the value is `null`.

`readonly` **`window`**`: {window}`

This property holds a reference to the window in which the document is rendered.

Method Details

`altKeyDown``(): {Boolean}`

www.EngineeringBooksPdf.com

This method checks if the Alt key is currently pressed.

Note that the information returned by this method may be inaccurate, because key-presses cannot be detected if the user changes the focus into a different window or browser tab.

Returns:

`{Boolean}`	`true` if the Alt key is currently pressed; `false` otherwise

`createElement(tagName, style): {Node}`

This method creates a new DOM node and sets the style properties to use the values supplied by the caller.

```
var page = nokia.maps.dom.Page(document);
var node = page.createElement("DIV", {
  backgroundColor: "rgb(255,0,0)",
  width: "200px",
  height: "200px"
});
```

It is also possible to create a node with specific attributes and style:

```
var page = nokia.maps.dom.Page(document);
var node = page.createElement({
tagName: "CANVAS",
width: 200,
height: 200,
style: {
  position: "absolute",
  top: 0,
  left: 0,
  width: "200px",
  height: "200px"
}
});
```

Parameters:

`tagName:`	`{String | Object}`
	The tag name of the DOM node to be created or an object, where the key `tagName` contains the tag name of the DOM node to be created and other keys reflect other properties of the node; the property `style` is used to declare the style sheet, however, if the `style` argument (see below) is supplied as well, it overwrites the style defined in `tagName`

www.EngineeringBooksPdf.com

style:	{Object} [optional]
	The style properties to be set in the node

Returns:

{Node}	The newly create node

ctrlKeyDown(): {Boolean}

This method checks if the Ctrl key is currently pressed.

Note that the information returned by this method may be inaccurate, because key-presses cannot be detected if the user changes the focus into a different window or browser tab.

Returns:

{Boolean}	true if the control key is currently pressed; false otherwise

getClientRect(node): {Object}

This method calculates the absolute position of a node relative to the document. The returned value can be compared with the pageX and pageY properties of mouse events.

Parameters:

node:	{Node}
	The DOM node for which the document page position is to be obtained

Returns:

{Object}	The position of the node within the document as an object containing the properties left, top, right, bottom, width and height, or null if detection fails or the given node is not a valid DOM node

metaKeyDown(): {Boolean}

This method checks if the Meta key is currently pressed.

Note that the information returned by this method may be inaccurate, because key-presses cannot be detected if the user changes the focus into a different window or browser tab.

here

www.EngineeringBooksPdf.com

Returns:

{Boolean}	true if the Meta key is currently pressed; false otherwise

static parseEvent(e): {nokia.maps.dom.Event}

This method parses the given native event and returns a corresponding normalized event object.

Parameters:

e:	{Object} The browser's native event object

Returns:

{nokia.maps.dom.Event}	A normalized DOM level 3 event object

Example:

```
       // If this is the listener to a native click event.
        (function (nativeEvent) {
            // Fix the native event so that evt.button will complies to
 W3C standard.
            var evt = nokia.maps.dom.Page.parseEvent(nativeEvent);
            alert(evt.button === 0 ? "left" : (evt.button == 1 ?
 "middle" : "right"));
       });
```

setStyle(node, style): {Node}

This method copies style properties into the style of the given DOM node.

```
var page = nokia.maps.dom.Page(document);
var node = document.createElement("DIV");
page.setStyle(node, {
 backgroundColor: "rgb(255,0,0)",
 width: "200px",
 height: "200px"
 });
```

Note that the above example could have been done more efficient by directly using the createElement method from the page interface.

www.EngineeringBooksPdf.com

Parameters:

node:	{Node}
	The DOM node for which the style properties should be set.
style:	{Object}
	The style properties to be set in the node.

Returns:

{Node}	The node.

shiftKeyDown(): {Boolean}

This method checks if the Shift key is currently pressed.

Note that the information returned by this method may be inaccurate, because key-presses cannot be detected if the user changes the focus into a different window or browser tab.

Returns:

{Boolean}	true if the left or right Shift key is currently pressed; false otherwise

update(): {*nokia.maps.dom.Page*}

This method updates all volatile properties of the page (e.g., the document size).

Returns:

{*nokia.maps.dom.Page*}

Returns the page object itself (this).

Interface: TextEvent

This interface is a member of ***nokia.maps.dom***.

Extends: *nokia.maps.dom.Event*

Interface Summary

This event is fired when text is entered.

www.EngineeringBooksPdf.com

[*For full details, see nokia.maps.dom.TextEvent*]

Table 44: Property Summary

Properties
data: {String} This property holds the data associated with the text event.
readonly ***DOM_INPUT_METHOD_DROP***: {Number} This field is an identifier indicating that text was inserted as part of a drag-and-drop operation.
readonly ***DOM_INPUT_METHOD_HANDWRITING***: {Number} This field is an identifier indicating that text was entered through a pen/tablet device and processed by handwriting recognition software.
readonly ***DOM_INPUT_METHOD_IME***: {Number} This field is an identifier indicating that text was entered through an Input Method Editor.
readonly ***DOM_INPUT_METHOD_KEYBOARD***: {Number} This field is an identifier indicating that text was entered, using through the keyboard.
readonly ***DOM_INPUT_METHOD_MULTIMODAL***: {Number} This field is an identifier indicating that text was inserted as part of an operation involving multiple input modalities in combination, such as pointer-enhanced speech.
readonly ***DOM_INPUT_METHOD_OPTION***: {Number} This field is an identifier indicating that text was selected from a set of options presented to the user, such as from a form.
readonly ***DOM_INPUT_METHOD_PASTE***: {Number} This field is an identifier indicating that text was pasted in from a clipboard.
readonly ***DOM_INPUT_METHOD_SCRIPT***: {Number} This field is an identifier indicating that text was inserted via a script operation on the DOM.
readonly ***DOM_INPUT_METHOD_UNKNOWN***: {Number} This field is an identifier indicating that text was entered by an unknown method.
readonly ***DOM_INPUT_METHOD_VOICE***: {Number} This field is an identifier indicating that text was input by a voice device and interpreted by speech recognition software.
inputMode: {Number} This property indicates the origin of the text input.

Directly Inherited Properties

www.EngineeringBooksPdf.com

Inherited from class *nokia.maps.dom.Event* :

AT_TARGET, *bubbles*, *BUBBLING_PHASE*, *canBubble*, *cancelable*, *canSicker*, *CAPTURING_PHASE*, *currentTarget*, *defaultPrevented*, *eventPhase*, *namespaceURI*, *nativeEvent*, *page*, *propagation*, *PROPAGATION_OK*, *PROPAGATION_STOP*, *PROPAGATION_STOP_IMMEDIATE*, *target*, *timeStamp*, *type*

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.dom.Event* :

cancel, *clone*, *preventDefault*, *preventUnload*, *stopImmediatePropagation*, *stopPropagation*

Interface Description

This event is fired if some text is entered from the keyboard, clipboard or from some other source.

Note that this class represents an unimplemented interface. It is included here to document its properties. The class is derived from *nokia.maps.dom.Event*, but, in addition to the properties of the parent class, it has the properties described here.

Property Details

`data: {String}`

This property holds the data associated with the text event. Its value are the characters generated by the character device. This may be a single Unicode character or a non-empty sequence of Unicode characters [Unicode]. Characters should be normalized as defined by the Unicode normalization form NFC. The property cannot be `null` or contain an empty string.

`readonly DOM_INPUT_METHOD_DROP: {Number}`

This field is an identifier indicating that text was inserted as part of a drag-and-drop operation. This may be associated with a drop event (described elsewhere).

`readonly DOM_INPUT_METHOD_HANDWRITING: {Number}`

This field is an identifier indicating that text was entered through a pen/tablet device and processed by handwriting recognition software. This may be associated with a specific event defined elsewhere.

www.EngineeringBooksPdf.com

`readonly` **`DOM_INPUT_METHOD_IME`**: `{Number}`

This field is an identifier indicating that text was entered through an Input Method Editor. This may be associated with a composition end event.

`readonly` **`DOM_INPUT_METHOD_KEYBOARD`**: `{Number}`

This field is an identifier indicating that text was entered, using through the keyboard. This may be associated with one or more of keypress, keydown, or keyup events.

`readonly` **`DOM_INPUT_METHOD_MULTIMODAL`**: `{Number}`

This field is an identifier indicating that text was inserted as part of an operation involving multiple input modalities in combination, such as pointer-enhanced speech. This may be associated with various other events (described elsewhere).

`readonly` **`DOM_INPUT_METHOD_OPTION`**: `{Number}`

This field is an identifier indicating that text was selected from a set of options presented to the user, such as from a form. This may be associated with various other events (described elsewhere).

`readonly` **`DOM_INPUT_METHOD_PASTE`**: `{Number}`

This field is an identifier indicating that text was pasted in from a clipboard. This may be associated with a paste event (described elsewhere).

`readonly` **`DOM_INPUT_METHOD_SCRIPT`**: `{Number}`

This field is an identifier indicating that text was inserted via a script operation on the DOM. This may be associated with one or more mutation events.

`readonly` **`DOM_INPUT_METHOD_UNKNOWN`**: `{Number}`

This field is an identifier indicating that text was entered by an unknown method.

`readonly` **`DOM_INPUT_METHOD_VOICE`**: `{Number}`

www.EngineeringBooksPdf.com

This field is an identifier indicating that text was input by a voice device and interpreted by speech recognition software. This may be associated with a specific event defined elsewhere.

`inputMode`: {Number}

This property indicates the origin of the text input. Its value is one of the input method identifiers defined on this class, for example, DOM_INPUT_METHOD_UNKNOWN, DOM_INPUT_METHOD_KEYBOARD, DOM_INPUT_METHOD_PASTE, etc.

Interface: Touch

This interface is a member of ***`nokia.maps.dom`***.

Interface Summary

The Touch class represents a single touch on the surface of the screen.

[*For full details, see nokia.maps.dom.Touch*]

Table 45: Property Summary

Properties
`clientX`: {Number} This property holds the x-coordinate of the touch location relative to the window viewport.
`clientY`: {Number} This property holds the y-coordinate of the touch location relative to the window viewport.
`identifier`: {Number} This property holds a unique identifier for this touch object.
`pageX`: {Number} This property holds the x-coordinate of the touch location in page coordinates.
`pageY`: {Number} This property holds the y-coordinate of the touch location in page coordinates.
`screenX`: {Number} This property holds the x-coordinate of the touch location in screen coordinates.
`screenY`: {Number} This property holds the y-coordinate of the touch location in screen coordinates.
`target`: {Number}

www.EngineeringBooksPdf.com

Properties
This property holds the target of the given touch object.

Interface Description

A touch is the presence or movement of a finger that is part of a unique multi-touch sequence. Use the property `nokia.maps.dom.Event#changedTouches` to get all the touch objects that have changed in a touch event.

Property Details

`clientX`: `{Number}`

This property holds the x-coordinate of the touch location relative to the window viewport.

`clientY`: `{Number}`

This property holds the y-coordinate of the touch location relative to the window viewport.

`identifier`: `{Number}`

This property holds a unique identifier for this touch object.

`pageX`: `{Number}`

This property holds the x-coordinate of the touch location in page coordinates.

`pageY`: `{Number}`

This property holds the y-coordinate of the touch location in page coordinates.

`screenX`: `{Number}`

This property holds the x-coordinate of the touch location in screen coordinates.

`screenY`: `{Number}`

This property holds the y-coordinate of the touch location in screen coordinates.

www.EngineeringBooksPdf.com

target: {Number}

This property holds the target of the given touch object.

Interface: TouchEvent

This interface is a member of ***nokia.maps.dom***.

Extends: *nokia.maps.dom.Event*

Interface Summary

This event represents touches on touch screens.

[*For full details, see nokia.maps.dom.TouchEvent*]

Table 46: Property Summary

Properties
changedTouches: {*nokia.maps.dom.Touch*[]} This property holds a collection of *nokia.maps.dom.Touch* objects representing all touches that changed in this event.
rotation: {Number} This property holds the delta rotation since the start of an event in degrees, where clockwise is positive and counter-clockwise is negative.
scale: {Number} This property holds the distance between two fingers since the start of an event, as a multiplier of the initial distance.
targetTouches: {*nokia.maps.dom.Touch*[]} This property holds a collection of *nokia.maps.dom.Touch* objects representing all touches that have the same target as the original target of the first touch on the screen.
touches: {*nokia.maps.dom.Touch*[]} This property is an array holding all current instances of *nokia.maps.dom.Touch* that represent user's touches on the screen surface.

Directly Inherited Properties

Inherited from class *nokia.maps.dom.Event* :

AT_TARGET, *bubbles*, *BUBBLING_PHASE*, *canBubble*, *cancelable*, *canSicker*, *CAPTURING_PHASE*, *currentTarget*, *defaultPrevented*, *eventPhase*, *namespaceURI*, *nativeEvent*, *page*, *propagation*,

www.EngineeringBooksPdf.com

PROPAGATION_OK, *PROPAGATION_STOP*, *PROPAGATION_STOP_IMMEDIATE*, *target*, *timeStamp*, *type*

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.dom.Event* :

cancel, *clone*, *preventDefault*, *preventUnload*, *stopImmediatePropagation*, *stopPropagation*

Interface Description

This interface represents events relating to the user's touching, tapping or dragging on a touch screen, for example, on mobile phones or some computers (such as laptops) that support touch screens.

Note that this class represents an unimplemented interface. It is included here to document its properties. The class is derived from *nokia.maps.dom.Event*, but, in addition to the properties of the parent class, it has the properties described here.

Property Details

changedTouches: {*nokia.maps.dom.Touch*[]}

This property holds a collection of *nokia.maps.dom.Touch* objects representing all touches that changed in this event.

rotation: {Number}

This property holds the delta rotation since the start of an event in degrees, where clockwise is positive and counter-clockwise is negative. The initial value is 0.0.

scale: {Number}

This property holds the distance between two fingers since the start of an event, as a multiplier of the initial distance. The initial value is 1.0. If the value is less than 1.0, the gesture is pinch close (to zoom out). If the value is greater than 1.0, the gesture is pinch open (to zoom in).

targetTouches: {*nokia.maps.dom.Touch*[]}

www.EngineeringBooksPdf.com

This property holds a collection of *nokia.maps.dom.Touch* objects representing all touches that have the same target as the original target of the first touch on the screen.

touches: {*nokia.maps.dom.Touch*[]}

This property is an array holding all current instances of *nokia.maps.dom.Touch* that represent user's touches on the screen surface.

Interface: TouchEventTarget

This interface is a member of ***nokia.maps.dom***.

Interface Summary

This class is a *virtual* interface that exists only for documentation purposes.

[*For full details, see nokia.maps.dom.TouchEventTarget*]

Table 47: Event Summary

Events
dbltap
This event is fired after a two `tap` events have been fired in a certain amount of time.
gesturechange
This high-level event is fired whenever either of the two finger making a gesture is moved, changing the properties of the gesture.
gestureend
This high-level event is fired as soon as the gesture ends, for example because one of the two fingers touching the touch screen are lifted.
gesturestart
This high-level event is fired when two or more fingers touch the touch screen and are used to make a "gesture".
longpress
This event is fired after a finger has been pressed against the screen for a certain amount of time without starting a drag or gesture.
tap
This event is fired after a `touchstart` and `touchend` has occurred at the same target and only if neither of the `touchstart` nor the `touchend` event has been canceled and no gesture was started in between.
touchend

www.EngineeringBooksPdf.com

Events
This event is fired when a finger is lifted from a touch screen.
touchmove
This event is fired when a finger touches and moves on a touch screen.
touchstart
This event is fired when a finger is touches a touch screen.

Interface Description

Each class implementing this interface delcares that it can act as the target for certain events. Each event in this interface (and therefore also within the classes implementing the interface) represents an event of a specific type.

The following example shows event handling for events of the type "click":

```
// Note that "obj" can be either a DOM node or any other JavaScript object.
var obj = nokia.maps.dom.EventTarget( {} );
obj.addListener("click", function (evt) {
 console.log("This is the '"+evt.type+"' event!");
});

obj.dispatch( new nokia.maps.dom.Event({
 type: "click"
});
```

The example creates an instant of `nokia.maps.dom.EventTarget`, adds a listener for "click" events to it, and dispatches a "click" event to all registered listeners (in this case one) - the listeners receive the object that represents the target of the event.

For more information about dispatching events, please refer to the documentation of the *nokia.maps.dom.EventTarget*.

Event Details

dbltap

This event is fired after a two `tap` events have been fired in a certain amount of time.

Event Handler Parameters:	
`evt`	{*`nokia.maps.dom.TouchEvent`*} An object representing the event

www.EngineeringBooksPdf.com

gesturechange

This high-level event is fired whenever either of the two finger making a gesture is moved, changing the properties of the gesture.

Event Handler Parameters:	
evt	{*nokia.maps.dom.TouchEvent*} An object representing the event

gestureend

This high-level event is fired as soon as the gesture ends, for example because one of the two fingers touching the touch screen are lifted.

Event Handler Parameters:	
evt	{*nokia.maps.dom.TouchEvent*} An object representing the event

gesturestart

This high-level event is fired when two or more fingers touch the touch screen and are used to make a "gesture".

Event Handler Parameters:	
evt	{*nokia.maps.dom.TouchEvent*} An object representing the event

longpress

This event is fired after a finger has been pressed against the screen for a certain amount of time without starting a drag or gesture.

www.EngineeringBooksPdf.com

Event Handler Parameters:	
evt	{*nokia.maps.dom.TouchEvent*} An object representing the event

tap

This event is fired after a `touchstart` and `touchend` has occurred at the same target and only if neither of the `touchstart` nor the `touchend` event has been canceled and no gesture was started in between.

Event Handler Parameters:	
evt	{*nokia.maps.dom.TouchEvent*} An object representing the event

touchend

This event is fired when a finger is lifted from a touch screen.

Event Handler Parameters:	
evt	{*nokia.maps.dom.TouchEvent*} An object representing the event

touchmove

This event is fired when a finger touches and moves on a touch screen. This event is different from a `mousemove` event, because the user can touch the screen with more than one finger at the same time.

Event Handler Parameters:	
evt	{*nokia.maps.dom.TouchEvent*}

www.EngineeringBooksPdf.com

An object representing the event

touchstart

This event is fired when a finger is touches a touch screen.

Event Handler Parameters:	
evt	{*nokia.maps.dom.TouchEvent*} An object representing the event

Interface: WheelEvent

This interface is a member of ***nokia.maps.dom***.

Extends: *nokia.maps.dom.Event*

Interface Summary

This event is fired when mouse wheel is used.

[*For full details, see nokia.maps.dom.WheelEvent*]

Table 48: Property Summary

Properties
altKey: {Boolean} This field indicates the activation state of the modifier key Alt.
clientX: {Number} This property holds the horizontal coordinate at which the event occurred relative to the viewport associated with the event, if the wheel is associated with a pointing device.
clientY: {Number} This property holds the vertical coordinate at which the event occurred relative to the viewport associated with the event, if the wheel is associated with a pointing device.
ctrlKey: {Boolean} This field indicates the activation state of the modifier key Ctrl.
readonly ***deltaMode***: {Number} This property indicates the units of measurement for the delta values (rotation distance).

www.EngineeringBooksPdf.com

Properties

`readonly` ***deltaX***: {Number}

This property indicates the distance the wheel has rotated around the x-axis for a mouse-/wheel event or the number of pixels the mouse was moved since the last `drag` or `dragover` event within a drag operation.

`readonly` ***deltaY***: {Number}

This property indicates the distance the wheel has rotated around the y-axis for a mouse-/wheel event or the amount of pixel the mouse was moved since the last `drag` or `dragover` event within a drag operation.

`readonly` ***deltaZ***: {Number}

This property indicates the distance the wheel has rotated around the z-axis.

`readonly` ***DOM_DELTA_LINE***: {Number}

This field is an identifier specifying the units of measurement for the delta (rotation distance) as individual lines of text.

`readonly` ***DOM_DELTA_PAGE***: {Number}

This field is an identifier specifying the units of measurement for the delta (rotation distance) as pages, either defined as a single screen or as a demarcated page.

`readonly` ***DOM_DELTA_PIXEL***: {Number}

This field is an identifier specifying the units of measurement for the delta (rotation distance) as pixels.

metaKey: {Boolean}

This field indicates the activation state of the modifier key Meta.

pageX: {Number}

This property holds the horizontal coordinate at which the event occurred relative to the document associated with the event, if the wheel is associated with a pointing device.

pageY: {Number}

This property holds the vertical coordinate at which the event occurred relative to the document associated with the event, if the wheel is associated with a pointing device.

screenX: {Number}

This property holds the horizontal coordinate at which the event occurred relative to the origin of the screen coordinate system, if the wheel is associated with a pointing device.

screenY: {Number}

This property holds the vertical coordinate at which the event occurred relative to the origin of the screen coordinate system, if the wheel is associated with a pointing device.

shiftKey: {Boolean}

This field indicates the activation state of the modifier key Shift.

targetX: {Number}

www.EngineeringBooksPdf.com

Properties
This property holds the x-position of the cursor relative to the target, if the wheel is associated with a pointing device.
targetY: {Number} This property holds the y-position of the cursor relative to the target, if the wheel is associated with a pointing device.

Directly Inherited Properties

Inherited from class *nokia.maps.dom.Event* :

AT_TARGET, *bubbles*, *BUBBLING_PHASE*, *canBubble*, *cancelable*, *canSicker*, *CAPTURING_PHASE*, *currentTarget*, *defaultPrevented*, *eventPhase*, *namespaceURI*, *nativeEvent*, *page*, *propagation*, *PROPAGATION_OK*, *PROPAGATION_STOP*, *PROPAGATION_STOP_IMMEDIATE*, *target*, *timeStamp*, *type*

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.dom.Event* :

cancel, *clone*, *preventDefault*, *preventUnload*, *stopImmediatePropagation*, *stopPropagation*

Interface Description

This event indicates that a wheel on a pointing device has been rotated. It typically reflects the fact that the user has scrolled the mouse wheel, but it may also refer to scrollable elements of other pointing devices, for example trackballs.

Note that this class represents an unimplemented interface. It is included here to document its properties. The class is derived from *nokia.maps.dom.Event*, but, in addition to the properties of the parent class, it has the properties described here.

Property Details

altKey: {Boolean}

This field indicates the activation state of the modifier key Alt. It is set to `true` if the modifier is activated.

clientX: {Number}

This property holds the horizontal coordinate at which the event occurred relative to the viewport associated with the event, if the wheel is associated with a pointing device.

www.EngineeringBooksPdf.com

clientY: {Number}

This property holds the vertical coordinate at which the event occurred relative to the viewport associated with the event, if the wheel is associated with a pointing device.

ctrlKey: {Boolean}

This field indicates the activation state of the modifier key Ctrl. It is set to `true` if the modifier is activated.

readonly **deltaMode**: {Number}

This property indicates the units of measurement for the delta values (rotation distance). The default value is DOM_DELTA_PIXEL (pixels). The value of this property may be different for each of `deltaX`, `deltaY`, and `deltaZ`, based on system configuration.

readonly **deltaX**: {Number}

This property indicates the distance the wheel has rotated around the x-axis for a mouse-/wheel event or the number of pixels the mouse was moved since the last `drag` or `dragover` event within a drag operation.

readonly **deltaY**: {Number}

This property indicates the distance the wheel has rotated around the y-axis for a mouse-/wheel event or the amount of pixel the mouse was moved since the last `drag` or `dragover` event within a drag operation.

readonly **deltaZ**: {Number}

This property indicates the distance the wheel has rotated around the z-axis.

readonly **DOM_DELTA_LINE**: {Number}

This field is an identifier specifying the units of measurement for the delta (rotation distance) as individual lines of text. This is the case for many form controls.

www.EngineeringBooksPdf.com

`readonly` **`DOM_DELTA_PAGE`**`: {Number}`

This field is an identifier specifying the units of measurement for the delta (rotation distance) as pages, either defined as a single screen or as a demarcated page.

`readonly` **`DOM_DELTA_PIXEL`**`: {Number}`

This field is an identifier specifying the units of measurement for the delta (rotation distance) as pixels. This is the most typical case in most operating system and implementation configurations.

`metaKey``: {Boolean}`

This field indicates the activation state of the modifier key Meta. It is set to `true` if the modifier is activated.

`pageX``: {Number}`

This property holds the horizontal coordinate at which the event occurred relative to the document associated with the event, if the wheel is associated with a pointing device.

This is a proprietary member and not part of the W3C interface specification this class implements.

`pageY``: {Number}`

This property holds the vertical coordinate at which the event occurred relative to the document associated with the event, if the wheel is associated with a pointing device.

This is a proprietary member and not part of the W3C interface specification this class implements.

`screenX``: {Number}`

This property holds the horizontal coordinate at which the event occurred relative to the origin of the screen coordinate system, if the wheel is associated with a pointing device.

`screenY``: {Number}`

www.EngineeringBooksPdf.com

This property holds the vertical coordinate at which the event occurred relative to the origin of the screen coordinate system, if the wheel is associated with a pointing device.

`shiftKey`: `{Boolean}`

This field indicates the activation state of the modifier key Shift. It is set to `true` if the modifier is activated.

`targetX`: `{Number}`

This property holds the x-position of the cursor relative to the target, if the wheel is associated with a pointing device.

This is a proprietary member and not part of the W3C interface specification this class implements.

`targetY`: `{Number}`

This property holds the y-position of the cursor relative to the target, if the wheel is associated with a pointing device.

This is a proprietary member and not part of the W3C interface specification this class implements.

Namespace: geo

This namespace is a member of ***`nokia.maps`***.

Namespace Summary

This namespace offers facilities that allow you to create and manage objects and entities within the geographic coordinate system.

Namespace Description

This namespace offers facilities that allow you to create and manage objects and entities within the geographic coordinate system.

Class: BoundingBox

This class is a member of ***`nokia.maps.geo`***.

www.EngineeringBooksPdf.com

Class Summary

This class represents a rectangular area specified by two geographic coordinates.

[*For full details, see nokia.maps.geo.BoundingBox*]

Table 49: Property Summary

Properties
`readonly` ***bottomRight***: {*nokia.maps.geo.Coordinate*} This property holds an object containing geographic coordinates of the bottom right of the bounding box.
`readonly` ***isCDB***: {`Boolean`} This property holds a flag indicating whether the bounding box crosses the date border (`true`>) or not (`false`).
`readonly` ***topLeft***: {*nokia.maps.geo.Coordinate*} This property holds an object containing geographic coordinates of the top left of the bounding box.

Table 50: Method Summary

Methods
contains (bbox) : {`Boolean`} This method checks if the object supplied by the caller lies within the area of the given bounding box.
`static` ***coverAll*** (coordinates) : {*nokia.maps.geo.BoundingBox*} This constructs a bounding box from an array of point objects (instances of `Coordinate`).
`static` ***fromObject*** (obj, skipValidation) : {*nokia.maps.geo.BoundingBox*} This method constructs an instance of `BoundingBox` from a set of parameters supplied by the caller.
`static` ***fromPath*** (path, skipValidation) : {*nokia.maps.geo.BoundingBox*} This method constructs a bounding box from a `Strip` object that represents a path.
getCenter () : {*nokia.maps.geo.Coordinate*} This method returns an object containing the coordinates of the center of the given bounding box.
getHeight () : {`Number`} This method returns the height of the bounding box in decimal degrees.
getWidth () : {`Number`} This method returns the width of the bounding box in decimal degrees.
intersects (bbox) This method checks if the intersection of two bounding boxes is non-empty.

www.EngineeringBooksPdf.com

Methods
isEmpty `()` The method checks if the area enclosed by the given bounding box is 0.
`static` ***merge*** `(boxes) : {`*nokia.maps.geo.BoundingBox*`}` This method returns the smallest bounding box that covers all given boxes.
merge `(boxes)` This method returns the smallest bounding box that covers the given bounding box and those supplied by the caller.
resizeToCenter `(center) : {`*nokia.maps.geo.BoundingBox*`}` This method clones the given bounding box and resizes the clone if necessary until the location supplied by the caller is at its center.

Class Description

This class represents a rectangular area defined in terms of the geographic coordinates its top-left and bottom-right corners. A bounding box is not necessarily the smallest rectangle spanned by the two points. A bounding box wider than 180° or higher than 90° can be defined by setting the longitude of the top-left corner to a larger value than the longitude of the bottom-right corner. An instance of `BoundingBox` is immutable.

Constructor Details

`nokia.maps.geo.BoundingBox``(topLeft, bottomRight, skipValidation)`

This method initializes a new instance of `BoundingBox`.

Parameters:

`topLeft`: {*nokia.maps.geo.Coordinate*}

An object containing the geographical coordinates of the top left corner; latitude must be greater or at least the same as the latitude of `bottomRight`; longitude should be smaller than the longitude of `bottomRight`

`bottomRight`: {*nokia.maps.geo.Coordinate*} [optional]

An object containing the geographical coordinates of the bottom right corner; latitude must be lower or at least the same as the latitude of the top left corner; longitude should be greater than the longitude of the top left corner

www.EngineeringBooksPdf.com

`skipValidation`: {Boolean} [optional]

A flag indicating if the validation of the latitude is to be omitted; `true` means that no validation occurs, in which case the caller must ensure that the latitude of the bottom right corner is greater than that of the top left

Property Details

`readonly` **`bottomRight`**: {*`nokia.maps.geo.Coordinate`*}

This property holds an object containing geographic coordinates of the bottom right of the bounding box.

`readonly` **`isCDB`**: {Boolean}

This property holds a flag indicating whether the bounding box crosses the date border (`true`>) or not (`false`).

Note that a bounding box that spans the globe from -180° (West, on the left) to +180° (East, on the right) is not considered to cross the International Date Line (which roughly follows the 180° longitude).

Default Value: `false`

`readonly` **`topLeft`**: {*`nokia.maps.geo.Coordinate`*}

This property holds an object containing geographic coordinates of the top left of the bounding box.

Method Details

`contains``(bbox): {Boolean}`

This method checks if the object supplied by the caller lies within the area of the given bounding box. The object to check may either represent a point on the map or a bounding box.

Parameters:

bbox: {*`nokia.maps.geo.Coordinate`* | *`nokia.maps.geo.BoundingBox`*}

An object representing a point on the map or a bounding box

Returns:

www.EngineeringBooksPdf.com

{Boolean}	A boolean value, true indicates that the object supplied by the caller is contained within the given bounding box, while false indicates that the received object is not contained within the bounding box

`static` **`coverAll`**`(coordinates): {`*`nokia.maps.geo.BoundingBox`*`}`

This constructs a bounding box from an array of point objects (instances of Coordinate). If the method is successful, the caller receives the smallest bounding box that which contains all the points.

Parameters:

coordinates:	{*nokia.maps.geo.ICoordinate*[]} An array of point objects (instances of Coordinate

Returns:

{*nokia.maps.geo.BoundingBox*}
The calculated bounding box

`static` **`fromObject`**`(obj, skipValidation): {`*`nokia.maps.geo.BoundingBox`*`}`

This method constructs an instance of BoundingBox from a set of parameters supplied by the caller. The method accepts one parameter, which must be an array with four values top, left, bottom, right (lat, lng, lat,lng), or an array with two elements, each an instance of geo Coordinate. All latitude/longitude values must be given in decimal degrees (WGS84). The parameter can also be and innstance of BoundingBox.

Parameters:

obj:	{*nokia.maps.geo.BoundingBox* | Array} An array containing two point objects (instances of Coordinate), or an array of four coordinates (lat, lng, lat, lng), or a bounding box
skipValidation:	{Boolean} [optional, default: false] If true, then validation of latitude values is omitted when creating the bounding box; see also the constructor

Returns:

www.EngineeringBooksPdf.com

{*nokia.maps.geo.BoundingBox*}

The new geo bounding box or `null` if no bounding box could be created from the given parameter

`static` **`fromPath`**`(path, skipValidation): {`*nokia.maps.geo.BoundingBox*`}`

This method constructs a bounding box from a `Strip` object that represents a path. The caller receives a bounding box object which contains the path.

Parameters:

`path`: {*nokia.maps.geo.Strip*}

A `Strip` from which to create a bounding box object

`skipValidation`: {`Boolean`} [optional]

A Boolean, if `true`, validation of latitude is omitted

Returns:

{*nokia.maps.geo.BoundingBox*}

The calculated geo bounding box

`getCenter``(): {`*nokia.maps.geo.Coordinate*`}`

This method returns an object containing the coordinates of the center of the given bounding box.

Returns:

{*nokia.maps.geo.Coordinate*}

An instance of `Coordinate` representing the center of the bounding box on which the method has been called

`getHeight``(): {Number}`

This method returns the height of the bounding box in decimal degrees.

Returns:

www.EngineeringBooksPdf.com

{Number}	The height of the bounding box in decimal degrees.

getWidth(): {Number}

This method returns the width of the bounding box in decimal degrees.

Returns:

{Number}	The width of the bounding box in decimal degrees.

intersects(bbox)

This method checks if the intersection of two bounding boxes is non-empty.

Parameters:

bbox:	{*nokia.maps.geo.BoundingBox*} A BoundingBox object to be tested for intersection with the bounding box on which the method is called

Returns:

A {Boolean} indicating if the two bounding boxes intersect (true) or not (false)

isEmpty()

The method checks if the area enclosed by the given bounding box is 0.

Returns:

A {Boolean} indicating if the dimension of the bounding box is 0 (true) or not (false)

static merge(boxes): {*nokia.maps.geo.BoundingBox*}

This method returns the smallest bounding box that covers all given boxes.

Parameters:

www.EngineeringBooksPdf.com

boxes: {*nokia.maps.geo.BoundingBox*[]}

An array of BoundingBox instances to include in the new bounding box

Returns:

{*nokia.maps.geo.BoundingBox*}

A new instance of BoundingBox that contains the array of bounding boxes supplied by the caller

merge(boxes)

This method returns the smallest bounding box that covers the given bounding box and those supplied by the caller.

Parameters:

boxes: {*nokia.maps.geo.BoundingBox* | *nokia.maps.geo.BoundingBox*[]}

An array of instance of BoundingBox

Returns:

An instance of {nokia.maps.geo.BoundingBox} representing the smallest rectangular area that includes the bounding box on which the method was called as well as the bounding boxes provided by the caller

resizeToCenter(center): {*nokia.maps.geo.BoundingBox*}

This method clones the given bounding box and resizes the clone if necessary until the location supplied by the caller is at its center.

Parameters:

center: {*nokia.maps.geo.Coordinate*}

A point which is to be the center of the resized bounding box.

Returns:

www.EngineeringBooksPdf.com

{*nokia.maps.geo.BoundingBox*}

The resized bounding box

Class: Coordinate

This class is a member of ***nokia.maps.geo***.

Class Summary

This class represents a geographical location in WGS84 coordinate system.

[*For full details, see nokia.maps.geo.Coordinate*]

Table 51: Property Summary

Properties
`static` ***altModes***`: {String[]}` Array of possible altitude modes defined in *nokia.maps.geo.ICoordinate#altMode*

Directly Inherited Properties

Inherited from class *nokia.maps.geo.ICoordinate* :

altitude, *altMode*, *latitude*, *longitude*

Table 52: Method Summary

Methods
distance `(coord, straight) : {Number}` This method calculates the distance between the location represented by the given instance of `Coordinate` and that supplied by the caller.
equals `(other) : {Boolean}` This method checks if the location supplied by the caller is the same as the location represented by the given instance of `Coordinate`.
`static` ***fromObject*** `()` This method attempts to create an instance of `Coordinate` from the supplied arguments.
`static` ***isValid*** `(lat, lng, alt, altMode) : {Boolean}` This method checks if the received arguments are numbers and in valid ranges.
toString `() : {String}`

www.EngineeringBooksPdf.com

Methods
This method creates a string representation of the given instance of `Coordinate`.
walk `(bearing, distance, overGreatCircle) : {`*nokia.maps.geo.Coordinate*`}`
This method calculates the geographic coordinates of a destination point using the distance and bearing specified by the caller.

Class Description

This class represents a geographical location, a point on the map, defined in terms of its geographical coordinates latitude, longitude and (optionally) altitude. If a corresponding type is already provided by the platform, the product must not implement this class.

Constructor Details

`nokia.maps.geo.Coordinate``(lat, lng, alt, skipValidation, altMode)`

This method initializes a new instance of `Coordinate`

Parameters:

`lat`:	`{Number}` Latitude in degrees; values must be in the range [-90, 90], otherwise the error `IllegalArgument` is thrown
`lng`:	`{Number}` Longitude in degrees; values must be in the range [-180, 180], otherwise the error `IllegalArgument` is thrown
`alt`:	`{Number}` [optional, default: undefined] Altitude in meters
`skipValidation`:	`{Boolean}` [optional, default: false] If `true`, validation of the `latitude`, `longitude` and `altitude` is not performed
`altMode`:	`{String}` [optional] Altitude mode as string. If ommited "relative to ground level" is used. See *nokia.maps.geo.ICoordinate#altMode* for valid values.

www.EngineeringBooksPdf.com

Property Details

`static` **`altModes`**`: {String[]}`

Array of possible altitude modes defined in *nokia.maps.geo.ICoordinate#altMode*

Method Details

`distance``(coord, straight): {Number}`

This method calculates the distance between the location represented by the given instance of `Coordinate` and that supplied by the caller. The method uses the Haversine formula. Altitude is not considered.

Parameters:

`coord`:	{*`nokia.maps.geo.ICoordinate`*} An object representing the location to which the distance is to be calculated
`straight`:	{`Boolean`} [optional] An flag to compute distance in 3D space, not shortest distance on sphere.

Returns:

{`Number`}	The distance between the given location and the location supplied by the caller in meters

`equals``(other): {Boolean}`

This method checks if the location supplied by the caller is the same as the location represented by the given instance of `Coordinate`. Only latitude and longitude are compared.

Parameters:

`other`:	{*`nokia.maps.geo.Coordinate`*} The location whose coordinates are to be compared against those in the given location object

Returns:

{`Boolean`}	`true` if equal, otherwise `false`

www.EngineeringBooksPdf.com

static fromObject()

This method attempts to create an instance of Coordinate from the supplied arguments. Valid arguments are:

- an instance of nokia.maps.geo.Coordinate - if provided, no other arguments should be present
- two number values representing latitude and longitude (in this order)
- three number values representing latitude, longitude and altitude (in this order)
- an array of two numbers, where the first element is latitude and the second longitude
- an array of three numbers, where the first element is latitude, the second longitude and the third altitude
- an object containing the properties latitude and longitude - for example, {latitude: 50.1299, longitude: 8.568}
- an object containing the properties lat and lng - for example, {lat: 50.1299, lng: 8.568}

Returns:

A newly created instance of {nokia.maps.geo.Coordinate} or null

static isValid(lat, lng, alt, altMode): {Boolean}

This method checks if the received arguments are numbers and in valid ranges. Altitude should not be passed. If it is passed it must be a number not Infinity. Strings are not supported.

Parameters:

lat:	{Number}
	The latitude in decimal degrees to validate
lng:	{Number}
	The longitude in decimal degrees to validate
alt:	{Number} [optional]
	If supplied, the altitude in meters to validate
altMode:	{String} [optional]

www.EngineeringBooksPdf.com

If supplied, the altitude mode to validate

Returns:

{Boolean} `true` if the given values are valid; `false` otherwise

`toString``(): {String}`

This method creates a string representation of the given instance of `Coordinate`.

Returns:

{String} The resulting string representation of the given location point object

`walk``(bearing, distance, overGreatCircle): {`*`nokia.maps.geo.Coordinate`*`}`

This method calculates the geographic coordinates of a destination point using the distance and bearing specified by the caller.

Parameters:

`bearing`: {Number}

The bearing to use in the calculation in degrees

`distance`: {Number}

The distance to the destination in meters

`overGreatCircle`: {Boolean} [optional, default: false]

If true the computation uses the "Great Circle" otherwise "Rhumb Line".

Returns:

{*`nokia.maps.geo.Coordinate`*}

The calculated target as a location object containing geo coordinates

Interface: Corridor

This interface is a member of ***`nokia.maps.geo`***.

www.EngineeringBooksPdf.com

Interface Summary

This interface represents a belt that follows the path sweeping equal areas either side of this path.

[*For full details, see nokia.maps.geo.Corridor*]

Table 53: Property Summary

Properties
line: {*nokia.maps.geo.Shape*} This property holds a list of point objects (each defined in terms of its latitude and longitude).
radius: {Number} This property specifies the width of the corridor in meters.

Interface Description

This interface represents a belt that follows the path of a polyline, sweeping equal areas either side of the polyline. In routing, a corridor defines and area within which additional navigation can be provided to help the driver/pedestrian return to the calculated route after one or more wrong turns.

Property Details

line: {*nokia.maps.geo.Shape*}

This property holds a list of point objects (each defined in terms of its latitude and longitude). The polyline connecting those points marks the path of the corridor.

radius: {Number}

This property specifies the width of the corridor in meters.

Interface: ICoordinate

This interface is a member of ***nokia.maps.geo***.

Interface Summary

This interface defines the properties of an instance of `Coordinate`.

[*For full details, see nokia.maps.geo.ICoordinate*]

www.EngineeringBooksPdf.com

Table 54: Property Summary

Properties
`readonly` ***`altitude`***`: {Number | undefined}` This property holds the value of altitude in meters.
`readonly` ***`altMode`***`: {String | undefined}` This property holds a string indicating the altitude mode for the given instance of `ICoordinate`.
`readonly` ***`latitude`***`: {Number}` This property holds the value of latitude as a numeric value in the range from -90 (south) to +90 (north) degrees.
`readonly` ***`longitude`***`: {Number}` This property holds the value of longitude as a numeric value in the range from -180 (west) to +180 (east) degrees.

Interface Description

This interface defines the properties of an instance of `Coordinate`.

Property Details

`readonly` **`altitude`**`: {Number | undefined}`

This property holds the value of altitude in meters. An undefined altitude is treated as 0.

`readonly` **`altMode`**`: {String | undefined}`

This property holds a string indicating the altitude mode for the given instance of `ICoordinate`. Note that if the property is not set, it is assumed that altitude is relative to ground level. When set, the value of the property must be one of:

- `"GL"` - indicates that altitude is relative to ground level
- `"OL"` - indicates that altitude is relative to obstruction level
- `"SL"` - indicates that altitude is relative to mean sea level
- `"SB"` - indicates that altitude is relative to sea bed
- `"WE"` - indicates that altitude is relative to WGS84 ellipsoid
- `"WG"` - indicates that altitude is relative to WGS84 geoid

`readonly` **`latitude`**`: {Number}`

www.EngineeringBooksPdf.com

This property holds the value of latitude as a numeric value in the range from -90 (south) to +90 (north) degrees.

`readonly` **`longitude`**`: {Number}`

This property holds the value of longitude as a numeric value in the range from -180 (west) to +180 (east) degrees.

Interface: Proximity

This interface is a member of ***`nokia.maps.geo`***.

Interface Summary

This interface defines an area of proximity as a geographic area in the shape of a circle.

[*For full details, see nokia.maps.geo.Proximity*]

Table 55: Property Summary

Properties
`center``: {`*`nokia.maps.geo.Coordinate`*`}` This property holds a mandatory reference to an instance of *`nokia.maps.geo.Coordinate`* that marks the center of the area of proximity.
`radius``: {Number}` This property holds the radius in meters.

Interface Description

This interface defines an area of proximity as a geographic area in the shape of a circle.

Property Details

`center``: {`*`nokia.maps.geo.Coordinate`*`}`

This property holds a mandatory reference to an instance of *`nokia.maps.geo.Coordinate`* that marks the center of the area of proximity.

`radius``: {Number}`

This property holds the radius in meters.

www.EngineeringBooksPdf.com

Class: Shape

This class is a member of ***nokia.maps.geo***.

Extends: *nokia.maps.geo.Strip*

Class Summary

This class represents a shape defined in terms of the geographic coordinates of its vertices (a geographic shape).

[*For full details, see nokia.maps.geo.Shape*]

Table 56: Method Summary

Methods
destroy ()
This method clean up itself and stopping all asynchronous code.
static ***fromLatLngArray*** (arr, closed, callback, ctx) : {*nokia.maps.geo.Shape*}
This method creates a shape from an array containing latitude and longitude (in decimal degrees) for all the points that are to define the shape.

Directly Inherited Methods

Inherited from class *nokia.maps.geo.Strip* :

add, *addAll*, *addAllAsync*, *addObserver*, *asArray*, *get*, *getLatLng*, *getLength*, *remove*, *removeObserver*, *set*, *splice*

Class Description

This class represents an observable geographic shape (derived from *nokia.maps.geo.Strip*) with a geometry contained in a geographic quadtree and allows testing for containment, square-based clipping and near-by analysis.

Constructor Details

nokia.maps.geo.Shape(closed, depth)

This method initializes a new instance of Shape.

Parameters:

www.EngineeringBooksPdf.com

`closed`: `{Boolean}` [optional, default: false]

A Boolan that indicates if the shape is a polygon (`true`) or a polyline (`false`).

`depth`: `{Number}` [optional, default: 10]

A value that specifies the depth of the underlying quad tree.

Method Details

`destroy()`

This method clean up itself and stopping all asynchronous code. It is allways better to call this method when instance is not needed instead of throwing away instance reference only.

`static fromLatLngArray(arr, closed, callback, ctx): {nokia.maps.geo.Shape}`

This method creates a shape from an array containing latitude and longitude (in decimal degrees) for all the points that are to define the shape. The method executes synchronously or asynchronously, depending on whether the caller provides a callback function as one of the arguments.

Parameters:

`arr`: `{Number[]}`

An array with latitude/longitude coordinates in decimal degrees

`closed`: `{Boolean}`

A flag indicating if the shape is closed (`true`) or not (`false`)

`callback`: `{Function}` [optional]

A caller-defined callback function; if provided, the method runs asynchronously and calls the callback as soon as it is finished; this is done for large coordinate arrays; The callback receives the generated shape instance and the supplied context as parameters

`ctx`: `{Object}` [optional]

The context in which the callback function is to be called; if not provided, the callback is called in the context of the window

www.EngineeringBooksPdf.com

Returns:

{*nokia.maps.geo.Shape*}

If the method is called synchronously (without a callback function) it returns the generated shape, otherwise it will returns `null`

Class: Strip

This class is a member of ***nokia.maps.geo***.

Class Summary

This class represents an array of locations defined by their geographic coordinates.

[*For full details, see nokia.maps.geo.Strip*]

Table 57: Method Summary

Methods
add `(coord, idx)` This method adds a single element to the given `Strip` object.
addAll `(coords, idx, mode)` This method adds a collection of coordinates to the given `Strip` instance.
addAllAsync `(coords, idx, mode, callback)` This method adds a collection of coordinates to the given `Strip` instance asynchronously.
addObserver `(callback, context)` This method registers a new `Strip` observer.
asArray `() : {Array[Number]}` This method retrieves all elements of the given strip object as an array.
`static` ***convertToArray*** `(coords, mode) : {Array[Number]}` This method converts an array of objects or numbers to an array containing latitude, longitude and altitude, depending on the specified conversion mode.
`static` ***fromObject*** `(value) : {`*nokia.maps.geo.Strip*`}` This method creates a new instance of `Strip` on the basis of the received value.
get `(idx) : {`*nokia.maps.geo.Coordinate*`}` This method retrieves a strip element at the specified index.

www.EngineeringBooksPdf.com

Methods
getLatLng `(idx, count) : {Number[]}` This method retrieves latitudes and longitudes from strip elements, starting at the caller-specified index.
getLength `() : {Number}` This method retrieves the number of elements held in the given strip object.
remove `(idx)` This method removes a single element at a specified index in the strip.
removeObserver `(callback, context) : {`*nokia.maps.util.OObject*`}` This method unregisters a `Strip` observer.
set `(idx, coord)` This method inserts an object containing the geographic coordinates of a location at the specified index in the given strip object.
splice `(idx, remove, coords, mode)` This method splices an array of coordinates into the given `Strip` instance or removes elements from the `Strip`.

Class Description

This class represents an array of locations defined by their geographic coordinates. The array optimizes the storage of the data it holds and supports specialized operations on them.

Constructor Details

`nokia.maps.geo.Strip(coords, mode)`

This method initializes a new instance of `Strip`.

Parameters:

`coords`: `{Number[] | nokia.maps.geo.Coordinate[]}`

Either an array of geographic coordinates following the pattern `[lat, lng, alt, ..., lat, lng, alt]` or an array of instances of `{@link nokia.maps.geo.Coordinate}`

`mode`: `{String}`

A string indicating how the array is to be interpreted, for details, please see `{@link nokia.maps.geo.Strip.convertToArray}()`.

www.EngineeringBooksPdf.com

Method Details

add(coord, idx)

This method adds a single element to the given Strip object.

Parameters:

coord:	{*nokia.maps.geo.Coordinate*}
	An object representing an element to be added to the Strip
idx:	{Number} [optional]
	An optional index at which the element is to be inserted

addAll(coords, idx, mode)

This method adds a collection of coordinates to the given Strip instance.

Parameters:

coords:	{Array}
	A collection containing coordinates to be added to the Strip; it can be either an array of latitude and longitude values or an array of objects that can be converted to instances of *nokia.maps.geo.Coordinate*.
idx:	{Number} [optional]
	The optional index at which the received collection of coordinates is to be inserted
mode:	{String} [optional]
	The optional mode indicating how coords should be interpreted (for details, please see *nokia.maps.geo.Strip.convertToArray*( ))

addAllAsync(coords, idx, mode, callback)

This method adds a collection of coordinates to the given Strip instance asynchronously.

Parameters:

www.EngineeringBooksPdf.com

`coords:` `{Array}`

The collection of coordinates to be added to the `Strip`; it can be either an array of latitude and longitude values or an array of objects that can be converted to instances of *`nokia.maps.geo.Coordinate`*

`idx:` `{Number}` [optional]

The optional index at which the collection is to be inserted

`mode:` `{String}` [optional]

The optional mode indicating how `coords` should be interpreted (for details please see *`nokia.maps.geo.Strip.convertToArray`*( ))

`callback:` `{Function}` [optional]

The optional callback function to be called when the operation is complete

`addObserver(callback, context)`

This method registers a new `Strip` observer.

Parameters:

`callback:` `{Function}`

A callback function to be invoked (when the `Strip` has been modified). The function must be able to accept the following arguments:

- (`Strip`) strip - the `Strip` instance itself
- (String) idx - the start index of the changes
- (Number) inserted - a value indicating how many elements that have been inserted
- (Array[Number]) removed - the coordinates that have been removed as an array of the form `[lat, lng, alt, ..., lat, lng, alt]`

`context:` `{Object}` [optional, default: null]

The context to use when the callback is invoked.

www.EngineeringBooksPdf.com

`asArray(): {Array[Number]}`

This method retrieves all elements of the given strip object as an array. The array format is `[lat, lng, alt, ..., lat, lng, alt]`.

Returns:

`{Array[Number]}`	An array of coordinate values (a copy of the given strip object's internal array).

`static convertToArray(coords, mode): {Array[Number]}`

This method converts an array of objects or numbers to an array containing latitude, longitude and altitude, depending on the specified conversion mode. The array has the form `[lat, lng, alt, ..., lat, lng, alt]`.

Parameters:

`coords`:	`{Array}` [optional] An optional collection of geographic coordinates to be inserted into the `Strip` after the start index; this argument can be either an array of latitude and longitude values or an array of objects that can be converted to instances of *`nokia.maps.geo.Coordinate`*
`mode`:	`{String}` [optional] An optional string indicating how the received array should be interpreted. The default value is "auto". The possible values are: • `"auto"` - if the array consists of numbers, it is interpreted as an array of the form `[lat, lng, ..., lat, lng]`; if the caller passes in an instance of `Strip`, the internal array of geographic points held in the received object is used; otherwise, the method attempts to convert each element of the received array to instances of `{@link nokia.maps.geo.Coordinate}` • `"coords"` - the method attempts to convert each element of the received array to instances of *`nokia.maps.geo.Coordinate`*, using the method *`nokia.maps.geo.Coordinate`*( ) • `"values lat lng alt"` - the method interprets the received array as a array of values, where latitude, longitude and altitude are given in the

www.EngineeringBooksPdf.com

order in which "lat", "lng" and "alt" appear in the mode string; "alt" is optional in the mode string; for example, "values lat lng alt" is interpreted to mean that the array has the format `[lat, lng, alt, ..., lat, lng, alt]`

- `"arrays lat lng alt"` - the method interprets the received array as containing sub-arrays, one with latitude values, one with longitude values and one with altitude values; these sub-arrays are ordered to mirror the order in which "lat", "lng" and "alt" appear in the mode string; "alt" is optional; for example, "arrays lat lng alt" is interpreted to mean that the array has the format `[[lat, lat, ...], [lng, lng, ...], [alt, alt, ...]]`

Additionally, the first element in the `mode` string can the keyword "unsafe" to prevent the method from running time-consuming input validation. This option should be used when the value of the argument `coords` comes from a trusted source. When "unsafe" precedes "auto" or "coords", *`nokia.maps.geo.Coordinate.fromObject`*( ) is not called, therefore no validation is performed and the received objects are assumed to contain the properties `latitude`, `longitude` and `altitude` (as in {@link nokia.maps.geo.Coordinate}). The fastest mode to use is `"unsafe values lat lng alt"`.

Returns:

`{Array[Number]}` An array in the form `[lat, lng, alt, ..., lat, lng, alt]`.

`static` **`fromObject`**`(value): {`*`nokia.maps.geo.Strip`*`}`

This method creates a new instance of `Strip` on the basis of the received value. If the caller provides an existing instance `Strip`, the same object is returned. If the caller provides an array, the array is converted to a `Strip` (note that `mode` must be the first item in the array -- please see *`nokia.maps.geo.Strip.convertToArray`*( ) for details). When it receives any other type of value/object, the method returns an empty `Strip`.

Parameters:

`value:` `{Object}`

An object or a value from which to create a `Strip` instance.

www.EngineeringBooksPdf.com

Returns:

{*nokia.maps.geo.Strip*}

An instance of `Strip` created on the basis of the object supplied by the caller.

get(idx): {*nokia.maps.geo.Coordinate*}

This method retrieves a strip element at the specified index.

Parameters:

idx: {Number}

The index from which the element should be retrieved.

Returns:

{*nokia.maps.geo.Coordinate*}

An object containing the geographic coordinates of a location.

getLatLng(idx, count): {Number[]}

This method retrieves latitudes and longitudes from strip elements, starting at the caller-specified index.

Parameters:

idx: {Number}

The index from which the coordinates should be retrieved.

count: {Number} [optional, default: 1]

The number of elements whose coordinates are to be retrieved; if the value is negative, the returned coordinates are presented in reverse order.

Returns:

{Number[]} An array of coordinates in the form `[lat, lng, lat, lng, ...]`.

www.EngineeringBooksPdf.com

getLength(): {Number}

This method retrieves the number of elements held in the given strip object.

Returns:

{Number}	The length of the strip as a number of elements.

remove(idx)

This method removes a single element at a specified index in the strip.

Parameters:

idx:	{Number}
	The index at which the element is to be removed

removeObserver(callback, context): {*nokia.maps.util.OObject*}

This method unregisters a Strip observer.

Parameters:

callback:	{Function}
	The observer callback function to be removed.
context:	{Object}
	The context object for the callback.

Returns:

{*nokia.maps.util.OObject*}	
	A reference to the given instance of Strip after the callback has been removed (an instance of OObject)

set(idx, coord)

This method inserts an object containing the geographic coordinates of a location at the specified index in the given strip object. A pre-existing element at the specified index is replaced. To extend

www.EngineeringBooksPdf.com

the strip, the insertion index must be equal to the index of the last element plus one - assuming a strip of n elements, the index must be n+1. An attempt use an index greater than n+1 results in an exception.

Parameters:

idx:	{Number}
	The index at which the element is to be inserted; if a strip element already exists at that index, it is replaced
coord:	{*nokia.maps.geo.Coordinate*}
	An object representing a location defined in terms of latitude and longitude to be added to the strip

splice(idx, remove, coords, mode)

This method splices an array of coordinates into the given Strip instance or removes elements from the Strip.

Parameters:

idx:	{Number}
	The start index after which elements should be removed and/or the collection is to be inserted
remove:	{Number}
	A value indicating how many elements should be removed after the start index
coords:	{Array} [optional]
	An optional collection of coordinates to be inserted into the Strip; it can be either an array of latitude and longitude values or an array of objects that can be converted to instances of {@link nokia.maps.geo.Coordinate}
mode:	{String} [optional]

www.EngineeringBooksPdf.com

An optional string indicating how the received array (`coords`) should be interpreted; for details, please see *`nokia.maps.geo.Strip.convertToArray`*( ) for further details.

Namespace: gfx

This namespace is a member of ***`nokia.maps`***.

Namespace Summary

This namespace defines classes and methods that provide facilities to create and manipulate graphics resources (images).

Namespace Description

This namespace defines classes and methods that provide facilities to create and manipulate graphics resources (images). The namespace provides support for bitmas, SVGs and IDL (Image Description Lanugauge).

Class: BitmapImage

This class is a member of ***`nokia.maps.gfx`***.

Extends: *nokia.maps.gfx.Image*

Class Summary

This class loads a bitmap image from a Web server and makes it available as a GFX image.

[*For full details, see nokia.maps.gfx.BitmapImage*]

Table 58: Property Summary

Properties
`readonly` ***`isBitmap`***`: {Boolean}` This bitfield property indicates that the given image is a bitmap.
`readonly` ***`naturalHeight`***`: {Number}` This property holds the natural height of the image in pixels.
`readonly` ***`naturalWidth`***`: {Number}` This property holds the natural width of the image in pixels.

www.EngineeringBooksPdf.com

Properties
`readonly` ***offsetX***`: {Number}` This property holds the x-offset (in pixels) within the image to create a sprite or `undefined`, if the image is not to be used to create a sprite.
`readonly` ***offsetY***`: {Number}` This property holds the y-offset (in pixels) within the image to create a sprite or `undefined`, if the image is not to be used to create a sprite.
src`: {String}` This property holds the URL of the image.

Directly Inherited Properties

Inherited from class *nokia.maps.gfx.Image* :

height, *opacity*, *state*, *width*

Table 59: Method Summary

Methods
clone `(doc, width, height, offsetX, offsetY) : {`*nokia.maps.gfx.BitmapImage*`}` This method clones the given image and clips it to the size specified by the caller (creating a sprite).

Directly Inherited Methods

Inherited from class *nokia.maps.gfx.Image* :

clone, *createElement*, *getDocument*, *prepare*, *setOpacity*

Class Description

The class `BitmapImage` loads a bitmap (PNG, GIF, JPEG and others) from a Web server and makes it available as a GFX image. The difference between a GFX image and a native DOM image is that a GFX image is not loaded unless it is necessary or forced by calling `prepare()`. Additionally, a GFX image can be clipped (sprite creation).

The main purpose of sprite images is to save server requests by adding multiple images into one image and then clip this single image to produce multiple images from one. GFX images are also used if it is unclear exactly when an image should be loaded. This applies for example to instances of *nokia.maps.map.Marker* and their icons. For example, you may add a thousand markers with different icon images to the map, but you only need to load those for the markers that are within the visible viewport.

www.EngineeringBooksPdf.com

```
// Create a reference to the document body.
var body = document.body || document._documentElement;

// Create a new bitmap.
var bitmap = new nokia.maps.gfx.BitmapImage("http://www.w3.org/Icons/WWW/
w3c_home_nb.png");

// Add the bitmap in original size into the body.
body.appendChild(bitmap.createElement());

// Clone the bitmap, pick out the center of the image (from pixel 16,16 a
 square of 32 pixel)
// and add that to the document body.
var sprite = bitmap.clone(document, 32,32, 16,16);
body.appendChild(sprite.createElement());

// Display the size of the image as soon as it is known.
sprite.prepare(function (img) {
 alert("natural image size: " + img.naturalWidth + "x" + img.naturalHeight);
 alert("current sprite offset-x/y: " + img.offsetX + ", " + img.offsetY + "
 with " + img.width + "x" + img.height + "px size");
});
```

Constructor Details

`nokia.maps.gfx.BitmapImage``(image, doc, width, height, offsetX, offsetY)`

This method creates a new image from an image URL or an already loaded *HTML image*.

The method accepts four optional parameters for width, height, x- and y-offset to define a viewport for an image and to allow for spriting. If only the width and height are supplied, but no x- and y-offset, then the image is scaled to match these dimensions. If no width or height are provided by the caller at all, the image size remains unchanged.

Parameters:

`image:`	`{String | Image}`
	Either a URL of an image or an already loaded HTML image
`doc:`	`{Document}` [optional]
	The document to which the instance of `BitmapImage` is to be bound; if this argument is omitted, the current document is used
`width:`	`{Number}` [optional]
	The target width of the image in pixels
`height:`	`{Number}` [optional]

www.EngineeringBooksPdf.com

	The target height of the image in pixels
`offsetX`:	`{Number}` [optional]
	The x-offset within the image to create a sprite (in pixels)
`offsetY`:	`{Number}` [optional]
	The y-offset within the image to create a sprite (in pixels)

Property Details

`readonly` **`isBitmap`**`: {Boolean}`

This bitfield property indicates that the given image is a bitmap.

Default Value:	`true`

`readonly` **`naturalHeight`**`: {Number}`

This property holds the natural height of the image in pixels. The value of the property may be `undefined` until the image has been prepared successfully.

`readonly` **`naturalWidth`**`: {Number}`

This property holds the natural width of the image in pixels. The value of the property may be `undefined` until the image has been prepared successfully.

`readonly` **`offsetX`**`: {Number}`

This property holds the x-offset (in pixels) within the image to create a sprite or `undefined`, if the image is not to be used to create a sprite.

`readonly` **`offsetY`**`: {Number}`

This property holds the y-offset (in pixels) within the image to create a sprite or `undefined`, if the image is not to be used to create a sprite.

`src``: {String}`

www.EngineeringBooksPdf.com

This property holds the URL of the image.

Method Details

clone(doc, width, height, offsetX, offsetY): {*nokia.maps.gfx.BitmapImage*}

This method clones the given image and clips it to the size specified by the caller (creating a sprite). The clone is attached either to the same document as the original image, or to another document if provided by the caller.

Parameters:

doc:	{Document} [optional]
	A reference to a document to which the image should be attached
width:	{Number} [optional]
	The target width of the image in pixels; if not provided, the current value is used
height:	{Number} [optional]
	The target height of the image in pixels; if not provided, the current value is used
offsetX:	{Number} [optional]
	The x-offset within the image to create a sprite (in pixels); if not provided, the current value is used
offsetY:	{Number} [optional]
	The y-offset within the image to create a sprite (in pixels); if not provided, the current value is used

Returns:

{*nokia.maps.gfx.BitmapImage*}

An object representing the cloned image

Class: CanvasPainter

This class is a member of ***nokia.maps.gfx***.

www.EngineeringBooksPdf.com

Extends: *nokia.maps.gfx.Painter*

Class Summary

This class render IDL into HTML5 Canvas tag.

[*For full details, see nokia.maps.gfx.CanvasPainter*]

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.gfx.Painter* :

createElement, *setOpacity*, *setScale*, *updateElement*

Class Description

An instance of `CanvasPainter` renders a *`nokia.maps.gfx.IDL`* object into a DOM node using a CANVAS tag. Stable environments for the the canvas painter Nokia has tested include Firefox, Chrome and Safari (on Mac, PC and iOS 4.x). Recognized known issues in certain versions are, as a rule, fixed by the browser vendors at short notice.

To instantiate this class, use the default constructor without arguments:

```
var myCanvasPainter= new nokia.maps.gfx.CanvasPainter();
```

Constructor Details

`nokia.maps.gfx.CanvasPainter()`

This method creates a new instance of a CanvasPainter.

Namespace: Color

This namespace is a member of ***`nokia.maps.gfx`***.

Namespace Summary

The static `Color` class offers methods to handle 32-bit integer color values.

Table 60: Method Summary

Methods
`static` ***`alpha`*** `(color) : {Number}`

www.EngineeringBooksPdf.com

Methods
This method retrieves the alpha byte of a compressed color.
`static` ***`blue`*** `(color) : {Number}` This method retrieves the blue byte of a compressed color.
`static` ***`byteOf`*** `(percent) : {Number}` This method converts a percentage value (given as a decimal fraction between 0 and 1 into a byte value (0 to 255).
`static` ***`compress`*** `(red, green, blue, alpha) : {Number}` This method compresses the red, green, blue an alpha bytes of a color into a 32-bit integer.
`static` ***`getCssHex`*** `(color, addAlpha, prefix) : {String}` This method converts a compressed color into a hexadecimal CSS string notation, for example `"#ff0000"`.
`static` ***`getCssRGB`*** `(color, addAlpha) : {String}` This method converts a compressed color into a CSS rgb string, for example `"rgb(255,0,0)"`.
`static` ***`getCssRGBA`*** `(color) : {String}` This method converts a compressed color into a CSS rgba string, for example, `"rgba(255,0,0,0.5)"`.
`static` ***`green`*** `(color) : {Number}` This method retrieves the green byte of a compressed color.
`static` ***`parseCss`*** `(cssColor, defaultOpacity) : {Number}` This method parses a CSS color definition into a compressed color (a 32-bit integer).
`static` ***`percentOf`*** `(byteValue) : {Number}` This method converts a byte value (0 to 255) into a percentage value expressed as a decimal fraction between 0 and 1.
`static` ***`red`*** `(color) : {Number}` This method retrieves the red byte of a compressed color.

Namespace Description

This class offers methods to handle 32-bit integer color values. A 32-bit integer offers the most efficient way to store a color and is used, for example, in *nokia.maps.gfx.IDL*.

The methods on this class compress an RGBA (red, green, blue, alpha) color value into a 32-bit integer, extract values from a 32-bit integer, parse CSS strings into 32-bit integer color values or to create CSS strings from a 32-bit integer color value.

www.EngineeringBooksPdf.com

Method Details

`static` **`alpha`**`(color): {Number}`

This method retrieves the alpha byte of a compressed color.

Parameters:

`color`:	`{Number}`
	A color as a 32-bit integer

Returns:

`{Number}`	The alpha part of the compressed color as a a value between 0 and 255

`static` **`blue`**`(color): {Number}`

This method retrieves the blue byte of a compressed color.

Parameters:

`color`:	`{Number}`
	A color as a 32-bit integer

Returns:

`{Number}`	The blue part of the compressed color as a value between 0 and 255

`static` **`byteOf`**`(percent): {Number}`

This method converts a percentage value (given as a decimal fraction between 0 and 1 into a byte value (0 to 255).

Parameters:

`percent`:	`{Number}`
	A decimal fraction between 0 and 1, representing a percentage value

Returns:

`{Number}`	A number between 0 and 255, representing a byte value

www.EngineeringBooksPdf.com

`static` **`compress`**`(red, green, blue, alpha): {Number}`

This method compresses the red, green, blue an alpha bytes of a color into a 32-bit integer.

Parameters:

`red`:	`{Number}`
	The red byte of the color as a value between 0 and 255
`green`:	`{Number}`
	The green byte of the color as a value between 0 and 255
`blue`:	`{Number}`
	The blue byte of the color as a value between 0 and 255
`alpha`:	`{Number}`
	The alpha byte of the color as a value between 0 and 255

Returns:

`{Number}`	The compressed 32-bit integer representing the color

Example:

```
// Compress a semi-transparent red color
var color = nokia.maps.gfx.Color.compress(255, 0, 0, 127);
```

`static` **`getCssHex`**`(color, addAlpha, prefix): {String}`

This method converts a compressed color into a hexadecimal CSS string notation, for example `"#ff0000"`.

Parameters:

`color`:	`{Number}`
	A 32-bit integer representing a compressed color value
`addAlpha`:	`{Boolean}` [optional]

www.EngineeringBooksPdf.com

A flag indicating whether to add the alpha byte (`true`) and thus an eight-character hex string instead or return a six-character RGB string

`prefix:` `{String}` [optional]

The prefix to add in front of the returned hex string, the default is "#"

Returns:

`{String}` A CSS hex string representing the given compressed color, for example `"#ff0000"`

`static` **`getCssRGB`**`(color, addAlpha): {String}`

This method converts a compressed color into a CSS rgb string, for example `"rgb(255,0,0)"`.

Parameters:

`color:` `{Number}`

A 32-bit integer containing a compressed color value

`addAlpha:` `{Boolean}` [optional]

A flag idicating whether to return an rgba string (`true`) or an rgb string (`false`)

Returns:

`{String}` A valid CSS rgb color value, for example `"rgb(255,0,0)"`

`static` **`getCssRGBA`**`(color): {String}`

This method converts a compressed color into a CSS rgba string, for example, `"rgba(255,0,0,0.5)"`.

Parameters:

`color:` `{Number}`

A 32-bit integer containing a compressed color value

www.EngineeringBooksPdf.com

Returns:

`{String}`	A valid CSS rgba color value, for example `"rgba(255,0,0,0.5)"`

`static green(color): {Number}`

This method retrieves the green byte of a compressed color.

Parameters:

`color`:	`{Number}` A color as a 32-bit integer

Returns:

`{Number}`	The green part of the compressed color as a value between 0 and 255

`static parseCss(cssColor, defaultOpacity): {Number}`

This method parses a CSS color definition into a compressed color (a 32-bit integer).

Parameters:

`cssColor`:	`{String}` The CSS color definition as a hexadecimal string, for example "#ff00ff".
`defaultOpacity`:	`{Number}` [optional] The default opacity of the color as a percentage (given as a decimal fraction between 0 and 1); the default is 1 (opaque); if no opacity is specified in the `cssColor`, then `defaultOpacity` is used

Returns:

`{Number}`	The compressed color representation of the received hexadecimal string or `null` if the parsing failed

`static percentOf(byteValue): {Number}`

www.EngineeringBooksPdf.com

This method converts a byte value (0 to 255) into a percentage value expressed as a decimal fraction between 0 and 1.

Parameters:

`byteValue:`	`{Number}`
	A byte value between 0 and 255

Returns:

`{Number}`	The corresponding percentage value as a double (a decimal fraction between 0 and 1)

`static` **`red`**`(color): {Number}`

This method retrieves the red byte of a compressed color.

Parameters:

`color:`	`{Number}`
	A color as a 32-bit integer

Returns:

`{Number}`	The red part of the compressed color as a value between 0 and 255

Class: Graphics

This class is a member of ***`nokia.maps.gfx`***.

Class Summary

This class represents a two-dimensional graphics context.

[*For full details, see nokia.maps.gfx.Graphics*]

Table 61: Method Summary

Methods
`beginImage` `(width, height, description) : {`*`nokia.maps.gfx.Graphics`*`}`
This method resets the state of the graphics context and starts a new 2D image.

www.EngineeringBooksPdf.com

Methods

beginPath `() : {nokia.maps.gfx.Graphics}`

This method clears all sub-paths and starts a new path.

bezierCurveTo `(cp1x, cp1y, cp2x, cp2y, x, y) : {nokia.maps.gfx.Graphics}`

This method draws a Bezier curve from the current cursor position to a new position.

closePath `() : {nokia.maps.gfx.Graphics}`

This method closes the current sub-path.

drawEllipse `(x, y, w, h) : {nokia.maps.gfx.Graphics}`

This method creates a new ellipse path.

drawRect `(x, y, w, h, rx, ry) : {nokia.maps.gfx.Graphics}`

This method creates a new rectangle sub-path and closes it.

fill `() : {nokia.maps.gfx.Graphics}`

This method fills the current path.

fillText `(text, x, y, nx, ny) : {nokia.maps.gfx.Graphics}`

This method creates text path at the given position, oriented by a direction vector provided by the caller, closes it and then fills it with the fill color.

getDescription `() : {String}`

This method retrieves the description of the image.

getHeight `() : {Number}`

This method retrieves the height of the currently rendered image.

getIDL `() : {nokia.maps.gfx.IDL}`

This method retrieves the IDL of the given graphics context.

getWidth `() : {Number}`

This method retrieves the width of the currently rendered image.

lineTo `(x, y) : {nokia.maps.gfx.Graphics}`

This method draws a line from the current position to the pen position specified by the caller.

moveTo `(x, y) : {nokia.maps.gfx.Graphics}`

This method moves the cursor to the given position and starts a new sub-path.

polylineTo `(coords) : {nokia.maps.gfx.Graphics}`

This method draws a polyline from the current position along all the path specified by the caller as an aray of locations.

quadraticCurveTo `(cpx, cpy, x, y) : {nokia.maps.gfx.Graphics}`

www.EngineeringBooksPdf.com

Methods
This method draws a quadratic curve from the current cursor position to a new position.
restore `()` : {*nokia.maps.gfx.Graphics*} This method restores a previously saved state of the graphic context or, if the state has not been saved, replaces the current state with the default state.
rotate `(angle)` : {*nokia.maps.gfx.Graphics*} This method rotates the current projection matrix (z axis rotation).
save `()` : {*nokia.maps.gfx.Graphics*} This method saves the current state of the graphics context on the internal stack.
scale `(sx, sy)` : {*nokia.maps.gfx.Graphics*} This method scales the current projection matrix.
set `(key, value)` : {*nokia.maps.gfx.Graphics*} This method changes an IDL state property named by the caller.
setIDL `(idl)` : {*nokia.maps.gfx.Graphics*} This method replaces the current IDL with the object supplied by the caller.
stroke `()` : {*nokia.maps.gfx.Graphics*} This method strokes the current path.
strokeText `(text, x, y, nx, ny)` : {*nokia.maps.gfx.Graphics*} This method creates text path at the given position, oriented by a direction vector provided by the caller, closes it and then strokes it with the stroke color.
translate `(dx, dy)` : {*nokia.maps.gfx.Graphics*} This method translates the current projection matrix.

Class Description

The class represents a two-dimensional graphic context which produces an IDL (Image Description Language) object that can be rendered into a real image, using an instance of *nokia.maps.gfx.Painter*. The graphics context itself controls an IDL state and uses it to generate and IDL object.

Note that after creating a graphics context, the method `beginImage()` must be called, except when the graphics context has been initialized with a previously created IDL, for example:

```
// Initialize local variables.
var Color = nokia.maps.gfx.Color,
  parseCss = Color.parseCss,
  body = document.body || document.documentElement,
```

www.EngineeringBooksPdf.com

```
  graphics,
  painter,
  image,
  imageNode;

// Create a new image with a size of 64x64 pixels.
graphics =  new nokia.maps.gfx.Graphics();
graphics.beginImage(64, 64, "This is my image");
graphics.drawRect(16,16, 31,31);
graphics.set("fillColor", parseCss("red",0.5));
graphics.set("strokeColor", parseCss("black"));
graphics.set("lineWidth", 1);
graphics.fill();
graphics.stroke();
image = graphics.getIDL();

// Create a DOM element from the image using the default painter.
painter = new nokia.maps.gfx.Painter.defaultPainter();
imageNode = painter.createElement(image, document);

// Add this image node to the document.
body.appendChild(imageNode);
```

The above example creates a square box with the dimensions 32 x 32 pixels an a 1 pixel wide black border, filled with semi-transparent red color. Each side of the box measures 32 pixels and the inner square (inside the border) is 30 x 30 pixels. The graphics context uses the same coordinate projection as the IDL itself. A path consists of points and each point is infinitely small. The default origin of the coordinate system is the center of the top-left pixel of the destination surface (image). This means that, by default, the coordinate (0,0) is projected to the center of the top-left pixel at the position (0,0) of the image being created. Therefore if `lineWidth` is set to 1 and a `moveTo(1,1).lineTo(200,1)` is executed, all the pixels from the position (1,1) to (200,1) are stroked with a one-pixel-wide brush. Because the line is infinitely small and runs through the center of each pixel, all the pixels under the pen are colored, resulting in a line that is 201 pixels long.

Repeating the same exercise, but with `lineWidth` of two pixels, results in a 203 pixel long and 3 pixel high line, where the pixels from (1,1) to (200,1) are fully filled with black color. In the pixel row from (0,0) to (202,1) and from (0,2) to (202,2) only half of each pixel is filled. This is because we use a two-pixel-wide brush through the center of each pixel from (1,1) to (200,1), which means that we have to stroke one pixel above and one pixel below the center of those pixels. Therefore from the center of the pixel (1,1) we stroke one pixel up, filling the top half of the pixel (1,1) and the bottom half of the pixel (1,0). We then stroke one pixel down, filling the bottom half of the pixel (1,1) and the top half of the pixel (1,2). This results in a completely filled pixel (1,1), while the pixel (1,0) and (1,2) are only half filled. As it is impossible in reality to fill half a pixel, the rendering engine simulates this effect by not making the pixel fully black, but by calculating a color value that takes half the current color and half the new color taking opacity into account. This can lead to unwanted effects, therefore we advice cuation with `lineWidth` values that are multiples of 2.

here
www.EngineeringBooksPdf.com

Hint: For a box with a specific outer or inner size, subtract the line width from or add it to the length of the side of the box. So if you want a box with an outer size of exactly 200 pixels and a border width of 3 pixels, reduce the width and height in the call to `drawRect()` by three, which means you need to call the method, specifying 197 as width and height. This results in a rectangle with an outer size of 200 x 200 pixels and an inner size of 194 x 194 pixels, with a border that is three pixels wide.

Constructor Details

`nokia.maps.gfx.Graphics(idl)`

This method creates a new graphics context, either initialized with an IDL or an empty context.

Parameters:

`idl`:	{*`nokia.maps.gfx.IDL`*} [optional]
	An instance of `IDL` with which to initialize the new graphics context

Method Details

`beginImage(width, height, description): {nokia.maps.gfx.Graphics}`

This method resets the state of the graphics context and starts a new 2D image. The method must be called after the graphics context has been created.

Parameters:

`width`:	{`Number`}
	The width of the image to be created
`height`:	{`Number`}
	The height of the image
`description`:	{`String`} [optional]
	A description of the image, if omitted "undefined" is used

Returns:

{*`nokia.maps.gfx.Graphics`*}

The reference to the graphics context (`this`)

www.EngineeringBooksPdf.com

beginPath(): {*nokia.maps.gfx.Graphics*}

This method clears all sub-paths and starts a new path. The pen position is lost and a 'moveTo' operation has to be executed to ensure that there is a sub-path with cursor position (x,y) to continue drawing. Therefore the user agent must check if the context has any sub-path. In the absence of a sub-path, the user agent must create a one with the coordinates (x,y) as its first (and only) point, as if the 'moveTo' method had been called.

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (`this`)

bezierCurveTo(cp1x, cp1y, cp2x, cp2y, x, y): {*nokia.maps.gfx.Graphics*}

This method draws a Bezier curve from the current cursor position to a new position.

Note that the method does not stroke or fill the path.

Parameters:

cp1x:	{Number}
	The x component of the Bezier curve's first control point
cp1y:	{Number}
	The y component of the Bezier curve's first control point
cp2x:	{Number}
	The x component of the Bezier curve's second control point
cp2y:	{Number}
	The y component of the Bezier curve's second control point
x:	{Number}
	The x component of the new pixel position
y:	{Number}
	The y component of the new pixel position

www.EngineeringBooksPdf.com

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (this)

closePath(): {*nokia.maps.gfx.Graphics*}

This method closes the current sub-path.

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (this)

drawEllipse(x, y, w, h): {*nokia.maps.gfx.Graphics*}

This method creates a new ellipse path.

Note that the method does not stroke or fill the path.

Parameters:

x: {Number}

The left edge of the ellipse

y: {Number}

The top edge of the ellipse

w: {Number}

The width of the ellipse

h: {Number}

The height of the ellipse

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (this)

www.EngineeringBooksPdf.com

drawRect(x, y, w, h, rx, ry): {*nokia.maps.gfx.Graphics*}

This method creates a new rectangle sub-path and closes it.

Note that the operation does not cause the path to be stroked or filled. If you want to stroke the path, you should be aware that the path itself does not have a width or height, therefore a rectangle with the top-left corner at 0,0 and a size of 100 x 100 units becomes a 101 pixels wide rectangle if stroked with a `lineWidth` of 1. Stroking of the same original rectangle with a `lineWidth` of 3 produces a rectangle whose width is 103 pixels.

Parameters:

x:	{Number} The left edge of the rectangle
y:	{Number} The top edge of the rectangle
w:	{Number} The width of the rectangle
h:	{Number} The height of the rectangle
rx:	{Number} [optional] The horizontal radius of rounded corners. If omitted it will indicate no border rounding
ry:	{Number} [optional] The vertical radius of rounded corners. If not specified it will be the same as rx

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (`this`)

www.EngineeringBooksPdf.com

fill(): {*nokia.maps.gfx.Graphics*}

This method fills the current path.

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (this)

fillText(text, x, y, nx, ny): {*nokia.maps.gfx.Graphics*}

This method creates text path at the given position, oriented by a direction vector provided by the caller, closes it and then fills it with the fill color. Use *nokia.maps.gfx.Graphics#strokeText* method to add glow to text.

Parameters:

text:	{String}
	T he text to draw.
x:	{Number}
	The x component of the text anchor point
y:	{Number}
	The y component of the text anchor point
nx:	{Number} [optional]
	The x component of the absolute direction vector endpoint; if not provided, x + 1 is used
ny:	{Number} [optional]
	The y component of the absolute direction vector endpoint; if not provided, y is used

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (this)

www.EngineeringBooksPdf.com

getDescription(): {String}

This method retrieves the description of the image.

Returns:

{String}	The description of the image

getHeight(): {Number}

This method retrieves the height of the currently rendered image.

Returns:

{Number}	The height of the currently rendered image

getIDL(): {*nokia.maps.gfx.IDL*}

This method retrieves the IDL of the given graphics context.

Returns:

{*nokia.maps.gfx.IDL*}	The IDL of the given graphics context

getWidth(): {Number}

This method retrieves the width of the currently rendered image.

Returns:

{Number}	The width of the currently rendered image

lineTo(x, y): {*nokia.maps.gfx.Graphics*}

This method draws a line from the current position to the pen position specified by the caller.

Note that the method does not stroke or fill the path.

Parameters:

www.EngineeringBooksPdf.com

x: {Number}

The x-offset for the final pen position

y: {Number}

The y-offset for the final pen position

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (this)

moveTo(x, y): {*nokia.maps.gfx.Graphics*}

This method moves the cursor to the given position and starts a new sub-path.

Parameters:

x: {Number}

The x-offset for the cursor position

y: {Number}

The y-offset for the cursor position

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (this)

polylineTo(coords): {*nokia.maps.gfx.Graphics*}

This method draws a polyline from the current position along all the path specified by the caller as an aray of locations.

Note that the method does not stroke or fill the path.

Parameters:

coords: {Number[]}

www.EngineeringBooksPdf.com

An array of alternating x- and y-components of coordinates relative to the current position.

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (this)

quadraticCurveTo(cpx, cpy, x, y): {*nokia.maps.gfx.Graphics*}

This method draws a quadratic curve from the current cursor position to a new position.

Note that the method does not stroke or fill the path.

Parameters:

cpx: {Number}

The x component of the quadratic curve's control point

cpy: {Number}

The y component of the quadratic curve's control point

x: {Number}

The x component of the new pixel position

y: {Number}

The y component of the new pixel position

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (this)

restore(): {*nokia.maps.gfx.Graphics*}

This method restores a previously saved state of the graphic context or, if the state has not been saved, replaces the current state with the default state.

www.EngineeringBooksPdf.com

If the internal stack is empty, the method restores the default state.

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (`this`)

`rotate``(angle): {`*nokia.maps.gfx.Graphics*`}`

This method rotates the current projection matrix (z axis rotation).

Note that this does rotates the matrix of the context, rather than the image itself, which causes any subsequently created paths to be rotated, without affecting existing paths.

Parameters:

`angle`: {`Number`}

The rotation angle in degrees

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (`this`)

`save``(): {`*nokia.maps.gfx.Graphics*`}`

This method saves the current state of the graphics context on the internal stack.

Returns:

{*nokia.maps.gfx.Graphics*}

The reference to the given graphics context (`this`)

`scale``(sx, sy): {`*nokia.maps.gfx.Graphics*`}`

This method scales the current projection matrix.

Note that the operation scales the matrix of the context, rather than the image itself, which causes any subsequently created paths to be scaled, without affecting existing paths.

www.EngineeringBooksPdf.com

Parameters:

sx: {Number}

The scale factor along the x axis

sy: {Number}

The scale factor along the y axis

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (this)

set(key, value): {*nokia.maps.gfx.Graphics*}

This method changes an IDL state property named by the caller. The properties that can be changed are: width, height, description, strokeColor, fillColor, lineWidth, lineCap, lineJoin, miterLimit, font and textAlign.

Note that changing the width or height properties results in a complete reset of the graphics state and clearing of the image buffer, therefore changing the size clears and resets the graphics context.

Parameters:

key: {String}

The name of the property to modify

value: {Object}

The value to which to set the property

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (this)

See: *nokia.maps.gfx.IDL*

setIDL(idl): {*nokia.maps.gfx.Graphics*}

www.EngineeringBooksPdf.com

This method replaces the current IDL with the object supplied by the caller. The change of IDL affects the image size and description, but has no effect on the saved states.

Parameters:

`idl`: {*nokia.maps.gfx.IDL*}

An object representing the IDL to load

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (`this`)

Throws:

`{String}` An exception is thrown if the caller provides an illegal argument that does not represent a valid instance of `nokia.maps.gfx.IDL`

stroke(): {*nokia.maps.gfx.Graphics*}

This method strokes the current path.

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (`this`)

strokeText(text, x, y, nx, ny): {*nokia.maps.gfx.Graphics*}

This method creates text path at the given position, oriented by a direction vector provided by the caller, closes it and then strokes it with the stroke color.

Parameters:

`text`: `{String}`

The text to draw

`x`: `{Number}`

The x component of the text anchor point

www.EngineeringBooksPdf.com

y: {Number}

The y component of the text anchor point

nx: {Number} [optional]

The x component of the absolute direction vector endpoint; if not provided, x + 1 is used

ny: {Number} [optional]

The y component of the absolute direction vector endpoint; if not provided, y is used

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (this)

translate(dx, dy): {*nokia.maps.gfx.Graphics*}

This method translates the current projection matrix.

Note that this does translates the matrix of the context, rather than the image itself, which causes any subsequently created paths to be translated, without affecting existing paths.

Parameters:

dx: {Number}

The translation distance along the x axis

dy: {Number}

The translation distance along the y axis

Returns:

{*nokia.maps.gfx.Graphics*}

A reference to the given graphics context (this)

www.EngineeringBooksPdf.com

Class: GraphicsImage

This class is a member of ***nokia.maps.gfx***.

Extends: *nokia.maps.gfx.Image*

Class Summary

The class `GraphicsImage` is designed to render images within the client application at run time.

[*For full details, see nokia.maps.gfx.GraphicsImage*]

Table 62: Property Summary

Properties
`readonly` ***isGraphics***`: {Boolean}` This property indicates if an image is an instance of `GraphicsImage` (`true`) or not (`false`).

Directly Inherited Properties

Inherited from class *nokia.maps.gfx.Image* :

height, *opacity*, *state*, *width*

Table 63: Method Summary

Methods
getIDL `() : {`*nokia.maps.gfx.IDL*`}` This method retrieves the IDL object created by the given instance of graphics context.

Directly Inherited Methods

Inherited from class *nokia.maps.gfx.Image* :

clone, *createElement*, *getDocument*, *prepare*, *setOpacity*

Class Description

This class renders images within the client application at run time. The graphics image is not rendered at construction time for the same reason that a bitmap image is not loaded at construction time: rendering occurs when it is really necessary. Imagine there are 1000 map objects and the image for each object must be rendered depending on the properties of the object, for example, because the object contains traffic information. It would cost large amounts of CPU time to render all the images

www.EngineeringBooksPdf.com

and consume a lot of memory to keep the image data in memory while perhaps only a few of the objects may be visible in the current view.

The rendering of a graphics image is done by a function that is not called as soon as the image is needed. The same function can be used for multiple graphics images, therefore it is possible to implement a multi-painter, so a function that renders all markers and uses the marker properties as a source of information about how to render the markers.

It is also possible to create an instance of `GraphicsImage` without a rendering function, but using a pre-created *nokia.maps.gfx.IDL* or *nokia.maps.gfx.Graphics* context.

```
// Create a few shortcuts.
var GraphicsImage = nokia.maps.gfx.GraphicsImage,
  Color = nokia.maps.gfx.Color,
  parseCss = Color.parseCss;

// Create a reference to the document body.
var body = document.body || document.documentElement;

// Create a new graphics image.
var image = new GraphicsImage(function (graphics, graphicsImage) {
  // This will clear the canvas and set it's size to 64 x 64 pixel
  graphics.beginImage(64, 64, "MyImage");

  // Let's draw a circle with a 2 pixel black border and fill it with semi
  // transparent red color
  graphics.set("lineWidth", 2 );
  graphics.set("strokeColor", parseCss("black"));
  graphics.set("fillColor", parseCss("red", 0.5));

  // Create the path using a helper function.
  graphics.drawEllipse(16,16, 32,32);

  // Stroke and fill the path.
  graphics.stroke();
  graphics.fill();
});

// Add the graphics image to the body.
body.appendChild(image.createElement());
```

Constructor Details

`nokia.maps.gfx.GraphicsImage``(render_fn, context, doc, painter, args)`

This method creates a new graphics image instance.

Parameters:

`render_fn:` `{Function | nokia.maps.gfx.IDL | nokia.maps.gfx.Graphics}`

www.EngineeringBooksPdf.com

A function to be called as soon as the image is required; the function gets as its first argument the graphics context (an instance of *nokia.maps.gfx.Graphics*) that it uses to render the image, and as a second parameter an instance of *nokia.maps.gfx.GraphicsImage*, which represents the image to render; if the constructor is called with additional arguments, these are forwarded as additional arguments to the rendering function; optionally, an instance of *nokia.maps.gfx.IDL* or *nokia.maps.gfx.Graphics* context can be supplied to create a new graphics image instantly

`context:` `{Object}` [optional]

The context in which the rendering function is to be executed; if not specified the context (`this`) is bound to the given instance of *nokia.maps.gfx.GraphicsImage*

`doc:` `{Document}` [optional]

The document to which the given graphics image is bound; if omitted, the image is bound to the current document

`painter:` {*nokia.maps.gfx.Painter*} [optional]

The painter to be used to paint; if not supplied, the painter currently assigned to the static property `defaultPainter` of the class *nokia.maps.gfx.Painter* is used; if this argument has an invalid value, it is ignored and the `defaultPainter` is used

`args ...:` `{Object}` [optional]

An arbitrary number of additional arguments to be forwarded to the rendering function

Property Details

`readonly` **`isGraphics`**`: {Boolean}`

This property indicates if an image is an instance of `GraphicsImage` (`true`) or not (`false`).

Default Value: `true`

www.EngineeringBooksPdf.com

Method Details

getIDL(): {*nokia.maps.gfx.IDL*}

This method retrieves the IDL object created by the given instance of graphics context.

Returns:

{*nokia.maps.gfx.IDL*}

The IDL generated by the given instance of graphics context

Class: IDL

This class is a member of ***nokia.maps.gfx***.

Class Summary

This class represents an image described in intermediate language.

[*For full details, see nokia.maps.gfx.IDL*]

Table 64: Property Summary

Properties
static ***attributeToIdentifier***: {Object} This hashmap allows a fast translation from an attribute name (key) to the attribute identifier (value).
data: {Object[]} This property holds an array of objects, each containing an IDL opcodes and associated parameters; the opcodes and their parameters describe the image.
readonly ***description***: {String} This property holds the description text of the image described by the given IDL instance.
readonly ***fillColor***: {Number} This property holds the current fill color as a 32-bit integer, default is 255 (black, transparent).
readonly ***font***: {String} This property holds the current font specified as a CSS font declaration, default is "10px sans-serif".
readonly ***height***: {Number} This property holds the height of the image described by the given IDL instance.
static ***identifierToAttribute***: {Object}

www.EngineeringBooksPdf.com

Properties
This hashmap allows a fast translation from an attribute identifier (key) to the attribute name (value).
`readonly` ***lineCap***`: {String}` This property holds the current line cap, can be `"butt"`, `"round"` or `"square"`, the default is `"butt"`.
`readonly` ***lineJoin***`: {String}` This property holds the current line join, can be `"round"`, `"bevel"` or `"miter"`, the default is `"miter"`.
`readonly` ***lineWidth***`: {Number}` This property holds the current line width in pixel, defaults is 1.
`readonly` ***miterLimit***`: {Number}` This property holds the current miter limit, the default is 10.
`readonly` ***opacity***`: {String}` This property holds the global opacity is applied to all shapes and combined with the stroke- and fill-opacity to generate the final opacity of a shape.
`static` ***opcodes***`: {Object}` This property holds a hashtable that contains opcodes, their numeric values, and descriptions.
`readonly` ***strokeColor***`: {Number}` This property holds the current stroke color as a 32-bit integer, default is 0 (black, opaque).
`readonly` ***textAlign***`: {String}` This property holds the current text alignment, can be `"start"`, `"end"`, `"left"`, `"right"` or `"center"`, default is "start".
`readonly` ***width***`: {Number}` This property holds the width of the image described by the given IDL.

Table 65: Method Summary

Methods
append `(idl) : {`*nokia.maps.gfx.IDL*`}` This method appends the IDL supplied by the caller to the current IDL instance, without changing the size or state of the received IDL.
clone `() : {`*nokia.maps.gfx.IDL*`}` This method returns a clone of the given IDL instance.
concat `(idl) : {`*nokia.maps.gfx.IDL*`}` This method combines the given IDL instance with the one supplied by the caller and returns a merged IDL.
push `(args)`

www.EngineeringBooksPdf.com

Methods
This method pushes the given IDL commands to the data array and it applies the matrix to all coordinates provided as parameters of opcodes.
resetState `()` This method resets the state of the given IDL instance object, and therefore sets all the properties to their defaults, clears the stack, but does not modify the `width`, `height`, `description` and `data` properties.
restoreState `() : {Object}` This method restores all attributes, except for `width`, `height`, `description` and `data`, from an internal stack.
saveState `(additionalData)` This method saves all attributes, except for `width`, `height`, `description` and `data`, to an internal stack.

Class Description

This class represents an image described in terms of a set of IDL (Image Description Language) instructions known as opcodes. The opcodes are interpreted to render the image based on a virtual rendering context that supports, in addition to opcodes, a set of state attributes. The opcodes either modify the state attributes or they cause drawing operations to be performed, using the current rendering context state.

The coordinate system

A point in IDL is infinitely small and a line or a Bezier curve are therefore infinitely thin as well. An IDL point with the coordinates 0,0 is projected onto the center of the screen pixel with the coordinates 0,0. This projection model differs from that used in SVG and the Canvas implementation, but it fits in with the model used by VML. We settled on this model simply because it makes rendering easier to understand and to handle.

The following example creates a 2D image, 64 x 64 pixels, showing a semi-transparent red rectangle, centered within the image and with a 1 pixel black opaque border:

```
 // Create a new IDL object.
var IDL = nokia.maps.gfx.IDL,
  parseCss = nokia.maps.gfx.Color.parseCss,
  top = IDL.opcodes,
  attr = IDL.attributeToIdentifier,
  idlImage = new IDL(
 [
  // Create a new image with a size of 64x64 pixel
  op.BEGIN_2D_IMAGE, 64, 64, "MyImage",

  // Create a new path that follows a rectangular shape with the top-left
  // corner of the bounding box at 16, 16 and a width and height of 32 x 32
  // pixels
  op.BEGIN_PATH,
```

www.EngineeringBooksPdf.com

```
 op.MOVE_TO, 16, 16,
 op.LINE_TO, 47, 16,
 op.LINE_TO, 47, 47,
 op.LINE_TO, 16, 47,
 op.CLOSE_PATH,

 // Fill and stroke the path
 op.SET, attr.fillColor, parseCss("red", 0.5),
 op.SET, attr.strokeColor, parseCss("black",1.0),
 op.SET, attr.lineWidth, 1.0,
 op.FILL,
 op.STROKE
]);

// Create an instance of the best painter for the current browser and
// platform and paint the IDL image into the document body
var body = document.body || document.documentElement,
    DefaultPainter = nokia.maps.gfx.Painter.defaultPainter,
    painter = new DefaultPainter();
body.appendChild(painter.createElement(idlImage, document));
```

Note that we do not recommend that you create an IDL object directly; it is better to use the class *nokia.maps.gfx.Graphics* for this purpose. The reason is that although "hand optimized" opcode can be small and maybe efficient in certain implementations, for example, a Canvas painter, but it can cause suboptimal performance if used with other painters such as VML, while the graphics context generates code that runs well in all implementations.

Constructor Details

`nokia.maps.gfx.IDL(idl)`

This method creates a new empty image description language object.

Parameters:

`idl`:	{*nokia.maps.gfx.IDL*} [optional] The IDL with which the given instance of the class is to be initialized; if not provided, an empty class instance is created

Property Details

`static attributeToIdentifier: {Object}`

This hashmap allows a fast translation from an attribute name (key) to the attribute identifier (value).

`data: {Object[]}`

www.EngineeringBooksPdf.com

This property holds an array of objects, each containing an IDL opcodes and associated parameters; the opcodes and their parameters describe the image.

The data always consists of one opcode, followed by fixed number of parameters for that opcode.

`readonly` **`description`**`: {String}`

This property holds the description text of the image described by the given IDL instance.

`readonly` **`fillColor`**`: {Number}`

This property holds the current fill color as a 32-bit integer, default is 255 (black, transparent).

See: *nokia.maps.gfx.Color*

`readonly` **`font`**`: {String}`

This property holds the current font specified as a CSS font declaration, default is "10px sans-serif".

`readonly` **`height`**`: {Number}`

This property holds the height of the image described by the given IDL instance.

`static` **`identifierToAttribute`**`: {Object}`

This hashmap allows a fast translation from an attribute identifier (key) to the attribute name (value).

`readonly` **`lineCap`**`: {String}`

This property holds the current line cap, can be `"butt"`, `"round"` or `"square"`, the default is `"butt"`.

The lineCap attribute defines the type of endings of lines. The butt value means that the end of each line has a flat edge. The round value means that a semi-circle is added to the end of the line. The square value means that a rectangle shall be added at the end of each line.

`readonly` **`lineJoin`**`: {String}`

www.EngineeringBooksPdf.com

This property holds the current line join, can be `"round"`, `"bevel"` or `"miter"`, the default is `"miter"`.

The lineJoin defines the type of corners that will be places where two lines meet. If the `lineJoin` is `"bevel"`, a filled triangle connecting the two opposite corners of the straight line, with the third point of the triangle being the join point.

The `"round"` value means that a filled arc connecting the two aforementioned corners of the join must be rendered at joins.

The `"miter"` value means that a second filled triangle must be rendered at the join, with one line being the line between the two aforementioned corners, abutting the first triangle, and the other two being continuations of the outside edges of the two joining lines, as long as required to intersect without going over the miter length.

The miter length is the distance from the point where the join occurs to the intersection of the line edges on the outside of the join. The miter limit ratio is the maximum allowed ratio of the miter length to half the line width. If the miter length would cause the miter limit ratio to be exceeded, this second triangle must not be rendered.

`readonly` **`lineWidth`**`: {Number}`

This property holds the current line width in pixel, defaults is 1.

`readonly` **`miterLimit`**`: {Number}`

This property holds the current miter limit, the default is 10.

See: *nokia.maps.gfx.IDL#lineCap*

`readonly` **`opacity`**`: {String}`

This property holds the global opacity is applied to all shapes and combined with the stroke- and fill-opacity to generate the final opacity of a shape. The value must be in the range from 0.0 (fully transparent) to 1.0 (opaque).

`static` **`opcodes`**`: {Object}`

This property holds a hashtable that contains opcodes, their numeric values, and descriptions. The contents are represented as list of opcode aliases, where each of the aliases is followed by a

www.EngineeringBooksPdf.com

further list showing the opcode value, the parameters and a description. The opcode aliases serve as hashtable keys (for example `BEGIN_PATH`), while the values are the numeric values of opcodes. Please use this reference when adding your own opcodes to the `data` property of the IDL.

- BEGIN_2D_IMAGE
  - Opcode: 45 (-)
  - Parameters: {Number} **width**, {Number} **height**, {String} **description**
  - Description: This is the first opcode (0x2D) that must apear in any 2D image description. It defines a new image with the given size of the canvas and sets the cursor to the position 0,0.
- BEGIN_PATH
  - Opcode: 64 (@)
  - Parameters: -
  - Description: Clear all sub-paths.
- MOVE_TO
  - Opcode: 77 (M)
  - Parameters: {Number} **x**, {Number} **y**
  - Description: Start a new subpath and move the cursor to the given pixel position within the canvas.
- LINE_TO
  - Opcode: 76 (L)
  - Parameters: {Number} **x**, {Number}
  - Description: Draw a line from the current cursor position to the given canvas position.
- BEZIER_CURVE_TO
  - Opcode: 67 (C)
  - Parameters: {Number} **cp1_x**, {Number} **cp1_y**, {Number} **cp2_x**, {Number} **cp2_y**, {Number} **x**, {Number} **y**
  - Description: Draw a Bezier curve of the 3rd degree from the current cursor position to the given **x** / **y** position using the two given control points.
- CLOSE_PATH
  - Opcode: 120 (x)
  - Parameters: -
  - Description: Close the last sub-path and connect the last point of the path with the first one, so that a fill operation can be performed.
- FILL

here

www.EngineeringBooksPdf.com

  - Opcode: 102 (f)
  - Parameters: -
  - Description: Close the last sub-path and fill all sub-paths with the current fill color.
- STROKE
  - Opcode: 115 (s)
  - Parameters: -
  - Description: Stroke all sub-paths with the current stroke style.
- DRAW_IMAGE
  - Opcode: 73 (I)
  - Parameters: {Image} **image**, {Number} **srcX**, {Number} **srcY**, {Number} **srcWidth**, {Number} **srcHeight**, {Number} **destX**, {Number} **destY**, {Number} **destWidth**, {Number} **destHeight**
  - Description: Slice part of a source image and draws it into the destination.
- DRAW_IDL
  - Opcode: 105 (i)
  - Parameters: {nokia.maps.gfx.IDL} **idl**, {Number} **srcX**, {Number} **srcY**, {Number} **srcWidth**, {Number} **srcHeight**, {Number} **destX**, {Number} **destY**, {Number} **destWidth**, {Number} **destHeight**
  - Description: Slice part of a source IDL and draws it into the destination.
- SAVE
  - Opcode: 62 (>)
  - Parameters: -
  - Description: Save the state of the rendering context at the stack (push).
- RESTORE
  - Opcode: 60 (<)
  - Parameters: -
  - Description: Restore the state of the rendering context from the stack (pop).
- SET
  - Opcode: 35 (#)
  - Parameters: {Number} **attributeIdentifier**, {Object} **value**
  - Description: Set the state attribute with the given identifier to the given value. The name of an attribute can be translated into its identifier using the static `attributeToIdentifier`

here

www.EngineeringBooksPdf.com

property and from its identifier to its name using the static `identifierToAttribute` property.

`readonly` **`strokeColor`**`: {Number}`

This property holds the current stroke color as a 32-bit integer, default is 0 (black, opaque).

See: *nokia.maps.gfx.Color*

`readonly` **`textAlign`**`: {String}`

This property holds the current text alignment, can be `"start"`, `"end"`, `"left"`, `"right"` or `"center"`, default is "start".

`readonly` **`width`**`: {Number}`

This property holds the width of the image described by the given IDL.

Method Details

`append``(idl): {`*`nokia.maps.gfx.IDL`*`}`

This method appends the IDL supplied by the caller to the current IDL instance, without changing the size or state of the received IDL.

Parameters:

`idl`: {*`nokia.maps.gfx.IDL`*}

The IDL to be appended to the given IDL instance

Returns:

{*`nokia.maps.gfx.IDL`*}

The reference to the given IDL instance

`clone``(): {`*`nokia.maps.gfx.IDL`*`}`

This method returns a clone of the given IDL instance.

www.EngineeringBooksPdf.com

Note that the only property that is deep-cloned is `data`. As a result, the clone contains a copied instruction set, but all other properties refer to the same values. The internal stack is cloned as well.

Returns:

{*nokia.maps.gfx.IDL*}

A clone of the given IDL instance

concat(idl): {*nokia.maps.gfx.IDL*}

This method combines the given IDL instance with the one supplied by the caller and returns a merged IDL.

Parameters:

idl: {*nokia.maps.gfx.IDL*}

The IDL to be appended to the given IDL instance

Returns:

{*nokia.maps.gfx.IDL*}

The new combined IDL, the image size of the current IDL is retained

push(args)

This method pushes the given IDL commands to the data array and it applies the matrix to all coordinates provided as parameters of opcodes.

Example:

```
var IDL = nokia.maps.gfx.IDL,
  Color = nokia.maps.gfx.Color,
  idl = new IDL(),
  opcodes = IDL.opcodes,
  attr = attributeToIdentifier;
 idl.push(
  opcodes.BEGIN_2D_IMAGE, 40, 40, "ExampleImage",
  opcodes.BEGIN_PATH,
  opcodes.MOVE_TO, 10, 10,
  opcodes.LINE_TO, 20, 10,
  opcodes.LINE_TO, 20, 20,
  opcodes.LINE_TO, 10, 20,
  opcodes.CLOSE_PATH,
```

www.EngineeringBooksPdf.com

```
 opcodes.SET, attr.fillColor, Color.parseCss("#ff0000",0.5),
 opcodes.FILL
);
```

Parameters:

`args ...:` `{Object}`

An arbitrary number of parameters that contain the IDL code to be pushed

`resetState()`

This method resets the state of the given IDL instance object, and therefore sets all the properties to their defaults, clears the stack, but does not modify the `width`, `height`, `description` and `data` properties.

`restoreState(): {Object}`

This method restores all attributes, except for `width`, `height`, `description` and `data`, from an internal stack.

If the internal stack is empty, the method restores the default state and therefore it has the same effect as `reset()`.

Returns:

`{Object}` Additional data that has been pushed to the internal stack, if any

`saveState(additionalData)`

This method saves all attributes, except for `width`, `height`, `description` and `data`, to an internal stack.

Parameters:

`additionalData:` `{Object}` [optional]

If provided, this object containing additional data is saved together with the rest of the state

www.EngineeringBooksPdf.com

Class: Image

This class is a member of ***nokia.maps.gfx***.

Class Summary

This class is an base class for all image implementations like graphic or bitmap image.

[*For full details, see nokia.maps.gfx.Image*]

Table 66: Property Summary

Properties
`readonly` ***height***: {Number} This property holds the height of the image in pixels.
opacity: {Number} This property holds the default opacity for the image.
`readonly` ***state***: {Number} This property holds the state of the image.
`readonly` ***width***: {Number} This property holds the width of the image in pixels.

Table 67: Method Summary

Methods
clone (doc) : {*nokia.maps.gfx.Image*} This method clones the given image and optionally binds it to a different document.
createElement (opacity) : {Node} This method creates a DOM node containing the given image.
`static` ***fromObject*** (obj, doc) : {*nokia.maps.gfx.Image*} This method attempts to create an appropriate *nokia.maps.gfx.Image* object from the object supplied by the caller.
getDocument () : {Document} This method retrieves the document to which the given image is bound.
prepare (callback, context, args) : {*nokia.maps.gfx.Image*} This method prepares the given image and calls a callback on completion or failure.

www.EngineeringBooksPdf.com

Methods
setOpacity (element, opacity) : {*nokia.maps.gfx.Image*}
This method changes the global opacity of an element returned by the createElement().

Class Description

This class is an abstract base class for all kinds of image implementations. An image is immutable: after an image instance has been created, it is prepared for painting, and once it has been prepared, it can no longer be modified. If the prepare() method is not called explicitly after an image has been created, the method createElement() invokes prepare() implicitly. Preparation depends on the image type, for example, the BitmapImage class loads the binary data of the image from a Web server, while the class GraphicsImage generates an IDL object that makes it possible to render the final image directly within the client, resulting in a VML, SVG or a Canvas element.

Further implementation are possible, each implementation must add a listener to the static array fromObjectListener to convert arbitrary objects into instances of the Image class automatically.

Note that each image is bound to a document and can only be used with that document. The binding must be set at image construction time and can not be changed later. The reason is that the prepare() method call is optional and can be explicit after the construction of the image and before the image is used or it is called implicitly by createElement(), which can be invoked on demand. If the document were passed as an argument to createElement(), problems might arise for explicitly prepared images as preparation may require knowledge about the document to which the image is to be added.

The following code extract shows how an image can be used in different frames:

```
var someFunction = function (gfxImage) {
 // Ensure that the given image is valid for our
 // current document and if not, import it.
 if (gfxImage.getDocument() !== document)
  gfxImage = gfxImage.clone(document);
 }
```

Property Details

readonly **height**: {Number}

This property holds the height of the image in pixels. The value may be zero until the image has been successfully prepared.

Note that the default value is zero, because a calculation with undefined would lead to an NaN result

www.EngineeringBooksPdf.com

opacity: {Number}

This property holds the default opacity for the image. The value is used when `createElement()` is called without a parameter. The value must be between 0 and 1 (default).

readonly **state**: {Number}

This property holds the state of the image.

The list below shows the possible values and explains their meaning:

- undefined - the image preparation has not been started yet
- -2 - the image preparation failed and calling the prepare again won't solve the problem
- -1 - the image preparation failed, but calling the prepare again might solve the problem
- 0 - the image preparation is currently ongoing
- 1 - the image preparation is finished successfully

Creating DOM nodes for an unprepared image or an image whose preparation failed results in an empty image with a size of 0 x 0 pixels.

readonly **width**: {Number}

This property holds the width of the image in pixels. The value may be zero until the image has been successfully prepared.

Note that the default value is zero, because a calculation with `undefined` would lead to an `NaN` result

Method Details

clone(doc): {*nokia.maps.gfx.Image*}

This method clones the given image and optionally binds it to a different document.

Parameters:

doc:	{Document} [optional]
	A reference to the document to which to bind the image clone; if provided and different from the document to which the image is currently bound, the clone is bound to the document to which this argument refers

www.EngineeringBooksPdf.com

Returns:

{*nokia.maps.gfx.Image*}

A reference to the image clone

createElement(opacity): {Node}

This method creates a DOM node containing the given image.

This method is synchronous and returns a rendered DOM node that represents the image. If the image is not yet successfully prepared, the preparation has failed or is ongoing, the returned image may be a blank image, with a size of 0 x 0 pixels. If the image is not yet prepared and no preparation is currently ongoing, this method calls the `prepare()` method.

Note that if an image is being prepared and the returned DOM node has the size of 0 x 0 pixels, the size may be updated automatically as soon as the preparation has finished successfully. Therefore, it is fail-safe to create, for example, a `BitmapImage` and to call the method `createElement()` directly, because if the image has not yet been loaded, it will then be loaded asynchronously and the returned DOM node will be extended as soon as the image is available.

Parameters:

`opacity`: `{Number}` [optional]

If provided, the value of this argument represents the opacity of the image being created; valid values lie between 0 (transparent) and 1 (opaque); if the argument is not provided, the value of the image property `opacity` is used

Returns:

`{Node}` A reference to the DOM node that can be added to the document containing the given image

Example:

```
  // Create a bitmap image.
var myImage = new nokia.maps.gfx.BitmapImage(
      "http://www.w3.org/Icons/WWW/w3c_home_nb.png");

 // Add the image to the document, prepare() is called
 // by the method createElement().
var body = document.body || document.documentElement;
body.appendChild(myImage.createElement());
```

www.EngineeringBooksPdf.com

`static` **`fromObject`**`(obj, doc): {`*`nokia.maps.gfx.Image`*`}`

This method attempts to create an appropriate *nokia.maps.gfx.Image* object from the object supplied by the caller.

Parameters:

`obj:` `{Object}`

An object to be converted into an `Image` instance

`doc:` `{Document}` [optional]

The document to which the new `Image` instance is to be bound; if not provided, the current document is used

Returns:

{*`nokia.maps.gfx.Image`*}

An instance of the `Image` class created from the received object or `null` if no `Image` object can be created

Example:

```
 // If GraphicsImage is included in the gfx
// package, it returns a graphics image on
// execution of the following code:
var myImage = nokia.maps.gfx.Image.fromObject(
    '<svg xmlns="http://www.w3.org/2000/svg" width="1000" height="600"
 viewBox="0 0 5 3">'+
    '<rect id="black_stripe" width="5" height="3" y="0" x="0" fill="#000"/
>'+
    '<rect id="red_stripe" width="5" height="2" y="1" x="0" fill="#D00"/
>'+
    '<rect id="gold_stripe" width="5" height="1" y="2" x="0"
 fill="#FFCE00"/>'
    '</svg>'
);
```

`getDocument``(): {Document}`

This method retrieves the document to which the given image is bound.

Returns:

www.EngineeringBooksPdf.com

{Document}	The document to which the given image is bound (set by the constructor and cannot be modified)

prepare(callback, context, args): {nokia.maps.gfx.Image}

This method prepares the given image and calls a callback on completion or failure. The callback and the context in which the callback is called are both provided by the caller.

Calling this method on an image that is already prepared leads to the callback being invoked immediately. If the method is called multiple times, all the supplied callback handlers are called in the order in which the method has been called.

Parameters:

callback:	{Function} A function to call as soon as the preparation is finished, whether successfully or not. The function must be able to receives as its first argument a reference to the GFX image, followed by all the additional parameters passed to this method
context:	{Object} [optional] An object representing the context in which to call the callback; if not supplied, the context (this) is bound to the given image object.
args ...:	{Object} [optional] An arbitrary number of additional arguments to be passed to the callback

Returns:

{nokia.maps.gfx.Image}

An instance of gfx.Image representing the given image (this)

Example:

```
 // Create a new bitmap image.
var myImage = new nokia.maps.gfx.BitmapImage("http://www.w3.org/Icons/WWW/
w3c_home_nb.png");

// Create a callback handler that shall be called as
// soon as the image is loaded.
var myCallback = function (image, msg) {
     // If preparing the image failed, show an error
```

www.EngineeringBooksPdf.com

```
      // message and return.
      if (image.state<1) return alert ("Failed to load image!");

      // Show the message supplied to the prepare method,
      // if any.
      if (msg) alert (msg);

      // Paint the image into the document.
      var body = image.doc.body || image.doc.documentElement;
      body.appendChild(image.createElement());
};

// Start the image preparation which (in this case)
// loads the bitmap from the Web server and then calls
// the callback. If the image is within the browser's
// cache, it may happen that the callback method is
// called immediately.
myImage.prepare(myCallback, null, "Hello World!");
```

setOpacity(element, opacity): {*nokia.maps.gfx.Image*}

This method changes the global opacity of an element returned by the `createElement()`.

Parameters:

`element:` `{Node}`

The DOM node that was returned by the `createElement()`

`opacity:` `{Number}`

The global opacity for the node as a number between 0 and 1

Returns:

{*nokia.maps.gfx.Image*}

The reference to the given image object (`this`)

Class: Painter

This class is a member of ***nokia.maps.gfx***.

Class Summary

This class is an abstract base class for all painter implementations.

[*For full details, see nokia.maps.gfx.Painter*]

www.EngineeringBooksPdf.com

Table 68: Property Summary

Properties
`static` ***`defaultPainter`***`: {Function}` This property holds a reference to the constructor of the default painter that can be used with the current browser/platform.

Table 69: Method Summary

Methods
`createElement` `(idl, doc, opacity) : {Node}` This method renders the supplied IDL object and returns a DOM node that can be added to the supplied document.
`setOpacity` `(element, opacity)` This method changes the global opacity of an element returned by the method `createElement()`.
`setScale` `(element, scale)` This method changes the scaling of an element returned by the method `createElement()`.
`updateElement` `(idl, node, opacity)` This method updates a DOM node that was previously returned by the method `createElement()` to the caller-supplied IDL object.

Class Description

This class is an abstract base class for all painter implementations. A painter renders a *nokia.maps.gfx.IDL* object using a specific method, for example via a CANVAS tag (*nokia.maps.gfx.CanvasPainter*), an SVG DOM node (*nokia.maps.gfx.SvgPainter*) or a VML DOM node (*nokia.maps.gfx.VmlPainter*).

Property Details

`static` **`defaultPainter`**`: {Function}`

This property holds a reference to the constructor of the default painter that can be used with the current browser/platform.

Note that the default painter need not to be the best painter, but it must be a painter that is fully supported by the current browser/platform. It may happen that there is no default painter, so this property may be set to `null`.

www.EngineeringBooksPdf.com

Method Details

createElement(idl, doc, opacity): {Node}

This method renders the supplied IDL object and returns a DOM node that can be added to the supplied document. The node must contain "something" (VML, SVG, Canvas tag or whatever is suitable) that can hold the image described by the IDL.

Parameters:

idl:	{*nokia.maps.gfx.IDL*}
	An IDL object describing the image to be rendered
doc:	{Document} [optional, default: document]
	A reference to the document for which the painter is to create an element; if omitted the current document is used
opacity:	{Number} [optional, default: 1]
	A value representing the opacity with which the element is to be created; if omitted or invalid, 1.0 (opaque) is used; must be a number between 0 (transparent) and 1 (opaque)

Returns:

{Node}	A reference to the DOM node that can be added into the given DOM node and represents the image described by the supplied IDL

setOpacity(element, opacity)

This method changes the global opacity of an element returned by the method createElement().

Parameters:

element:	{Node}
	A reference to the DOM node that was returned by createElement()
opacity:	{Number}
	A value representing global opacity for the node as a number between 0 and 1

www.EngineeringBooksPdf.com

setScale(element, scale)

This method changes the scaling of an element returned by the method createElement().

Parameters:

element:	{Node} A reference to the DOM node that was returned by createElement()
scale:	{*nokia.maps.util.Point*} A value representing scale factor for x and y axes

updateElement(idl, node, opacity)

This method updates a DOM node that was previously returned by the method createElement() to the caller-supplied IDL object. This can result in a complete re-rendering of the node's content or in a partial update, depending on the painter implementation and the number of changes made to the IDL.

Parameters:

idl:	{*nokia.maps.gfx.IDL*} An IDL object describing the image to be rendered
node:	{Node} A reference to the DOM node that was previously returned by the method createElement() and which is to be updated
opacity:	{Number} [optional, default: 1] A numeric value representing the opacity with which the element is to be updated; if omitted, or an invalid value, 1.0 (opaque) is used; the value must be a number between 0 (transparent) and 1 (opaque)

Class: SvgPainter

This class is a member of ***nokia.maps.gfx***.

Extends: *nokia.maps.gfx.Painter*

www.EngineeringBooksPdf.com

Class Summary

This class renders IDL into SVG tags.

[*For full details, see nokia.maps.gfx.SvgPainter*]

Table 70: Method Summary

Methods
createMarkup `(idl) : {String}` This method creates an SVG mark-up string from the received instance of *nokia.maps.gfx.IDL*.

Directly Inherited Methods

Inherited from class *nokia.maps.gfx.Painter* :

createElement, *setOpacity*, *setScale*, *updateElement*

Class Description

The class `SvgPainter` renders a *nokia.maps.gfx.IDL* into a DOM node with an SVG tag. This painter works with all browsers that support SVG. To instantiate this class, use the default constructor without arguments:

```
var mySvgPainter= new nokia.maps.gfx.SvgPainter();
```

Constructor Details

nokia.maps.gfx.SvgPainter()

This method creates a new SvgPainter instance.

Method Details

createMarkup(idl): {String}

This method creates an SVG mark-up string from the received instance of *nokia.maps.gfx.IDL*.

Parameters:

`idl`:	{*nokia.maps.gfx.IDL*} An image description language object that is to be converted into a mark-up string.

www.EngineeringBooksPdf.com

Returns:

{String}	The SVG mark-up string

Class: SvgParser

This class is a member of ***nokia.maps.gfx***.

Class Summary

This class converts a SVG string into IDL language.

[*For full details, see nokia.maps.gfx.SvgParser*]

Table 71: Method Summary

Methods
parseSvg (svgMarkup) : {*nokia.maps.gfx.IDL*} This method parses the supplied SVG string into an IDL object.
parseSvgInfo (svgMarkup) : {*nokia.maps.gfx.SvgParser.SvgMarkupInfo*} This method returns information about the SVG mark-up.
parseSvgToGraphics (svgMarkup, graphics) : {*nokia.maps.gfx.Graphics*} This method parses an SVG string and renders it using a graphics context.

Class Description

This class provides a facility to convert an SVG string into an instance of *nokia.maps.gfx.IDL*.

Example:

```
// Parse an SVG mark-up string.
var svgParser = new nokia.maps.gfx.SvgParser(),
    svgText = '<svg xmlns="http://www.w3.org/2000/svg" version="1.1"
 width="28" height="36" viewBox="0 0 28 36">' +
  '<path stroke="none" fill-opacity="0.40000003799999995" fill="#000000"
 d="M 18.9 33.4 C 18.9 34.8 16.7 36 13.899999999999999 36 C
 11.099999999999998 36 8.899999999999999 34.8 8.899999999999999
 33.4 C 8.899999999999999 32 11.099999999999998 30.799999999999997
 13.899999999999999 30.799999999999997 C 16.7 30.799999999999997 18.9 31.9
 18.9 33.4 Z">' +
  '</path><path stroke="none" fill-opacity="1" fill="#666666" d="M 14 0 C
 6.3 0 0 6.3 0 14.1 C 0 16.2 0.4 18.2 1.3 20.1 L 1.8 21.1 C 3 23.1 12.3 32.2
 13.3 33.2 L 14 33.9 L 14.7 33.2 C 15.7 32.2 25 23.1 26.1 21.2 L 26.7 20.2 C
 27.5 18.2 28 16.2 28 14.1 C 28 6.3 21.7 0 14 0 Z">' +
```

www.EngineeringBooksPdf.com

```
  '</path><path stroke="none" fill-opacity="1" fill="#666666" d="M 14 0.9 C
 21.2 0.9 27 6.8 27 14 C 27 16 26.6 17.9 25.8 19.6 L 25.3 20.5 C 24.2 22.4
 14 32.4 14 32.4 C 14 32.4 3.8 22.4 2.7 20.5 L 2.2 19.6 C 1.4 17.9 1 16 1 14
 C 1 6.8 6.8 0.9 14 0.9 Z">' +
  '</path><path stroke="none" fill-opacity="1" fill="#ffffff" d="M 14 0.9 C
 6.8 0.9 1 6.8 1 14 C 1 16 1.4 17.9 2.2 19.6 L 2.7 20.5 C 3.8 22.4 14 32.4
 14 32.4 C 14 32.4 24.2 22.4 25.3 20.5 L 25.8 19.6 C 26.6 17.9 27 16 27 14 C
 27 6.8 21.2 0.9 14 0.9 Z">' +
  '</path><path stroke="none" fill-opacity="1" fill="#ffffff" d="M 14 1.9 C
 20.6 1.9 26 7.3 26 14 C 25.9 16.1 25.5 18.2 24.4 20 C 23.8 21.2 17.9 27.1
 14 30.9 C 10.1 27.1 4.2 21.2 3.6 20.1 C 2.6 18.2 1.9 16.2 2 14 C 2 7.3 7.4
 1.9 14 1.9 Z">' +
  '</path><path stroke="none" fill-opacity="1" fill="#43a51b" d="M 14 1.9
 C 7.4 1.9 2 7.300000000000001 2 14 C 1.9 16.2 2.6 18.2 3.6 20.1 C 4.2
 21.3 10.1 27.1 14 31 C 17.9 27.1 23.8 21.3 24.4 20.1 C 25.5 18.3 25.9
 16.200000000000003 26 14.100000000000001 C 26 7.400000000000001 20.6
 2.0000000000000018 14 2.0000000000000018 L 14 2.0000000000000018 Z">' +
  '</path><path stroke="none" fill-opacity="0.7019608509999999"
 fill="#ffffff" d="M 21 6.1 C 17.8 3.5 13.7 2.5 11.9 3.9 C 11.4 4.3 11.2 4.8
 11.1 5.4 C 15.2 6 18.2 8.100000000000001 19.6 9.9 C 22 13 21.6 13.9 21.6
 13.9 C 22.400000000000002 13.9 23 13.700000000000001 23.5 13.3 C 25.3 11.9
 24.2 8.8 21 6.200000000000001 L 21 6.200000000000001 Z">' +
  '</path><text font-family="arial" font-size="13px" font-weight="bold"
 alignment-baseline="middle" text-anchor="middle" fill="#ffffff"
 opacity="0.866666749" y="0" x="0" transform="matrix(1, 0, 0, 1, 14,
 15)">X</text></svg>',
    idlImage = svgParser.parseSvg(svgText);

// And show it within the page.
var image = new nokia.maps.gfx.GraphicsImage(idlImage),
    body = document.body || document.documentElement;
body.appendChild(image.createElement());
```

Note that this parser does not support the full SVG standard but *SVG Tiny 1.1 standard*.

Constructor Details

`nokia.maps.gfx.SvgParser()`

This method creates a new instance of `SvgParser`

Method Details

`parseSvg(svgMarkup): {nokia.maps.gfx.IDL}`

This method parses the supplied SVG string into an IDL object.

Parameters:

`svgMarkup:` `{String | Document}`

An SVG mark-up string or an XML document

www.EngineeringBooksPdf.com

Returns:

{*nokia.maps.gfx.IDL*}

An IDL generated from the SVG mark-up

parseSvgInfo(svgMarkup): {*nokia.maps.gfx.SvgParser.SvgMarkupInfo*}

This method returns information about the SVG mark-up.

Parameters:

svgMarkup: {String | Document}

An SVG mark-up string or an XML document

Returns:

{*nokia.maps.gfx.SvgParser.SvgMarkupInfo*}

Information about the SVG mark-up or `null` if the SVG parsing failed

parseSvgToGraphics(svgMarkup, graphics): {*nokia.maps.gfx.Graphics*}

This method parses an SVG string and renders it using a graphics context. The method can be used to scale SVGs, as shown in the example below:

```
// Create the SVG parser, a graphics context and the SVG string
// that defines a 100 x 100 pixels SVG, with a circle in the
// middle that has a radius of 40 pixels.
var gfx = nokia.maps.gfx,
     svgParser = new gfx.SvgParser(),
     svgString = '<svg width="100" height="100" xmlns:xlink="http://
www.w3.org/1999/xlink" xmlns="http://www.w3.org/2000/svg"><g><title>Layer
 1</title><circle stroke-width="5" fill="#FF0000" id="svg_1" r="40" cy="50"
 cx="50"/></g></svg>',
     originalImage,
     scaledImage,
     body = document.getElementsByTagName("BODY")[0];

// First let's create a graphics image in original size.
originalImage = new gfx.GraphicsImage(
     // This function is called when the image is to be rendered.
     function (graphics) {
         // Parse the SVG string into an IDL.
         var idl = svgParser.parseSvg(svgString);
```

www.EngineeringBooksPdf.com

```
        // Create an image from the IDL.
        graphics.setIDL(idl);
    }
);

// And now one with the size doubled.
scaledImage = new gfx.GraphicsImage(
    // This method is called when the image is to be rendered.
    function (graphics) {
        // Parse the SVG and query information about it.
        var svgInfo = svgParser.parseSvgInfo(svgString);

        // Create a new image of the double size.
        graphics.beginImage(svgInfo.width*2,svgInfo.height*2,"scaled
image");

        // Scale x- and y-axis by 2.
        graphics.scale(2,2);

        // Render the SVG string into the existing graphics context using
        // the already parsed SVG document (this is faster than
        // parsing the XML twice).
        svgParser.parseSvgToGraphics(svgInfo.document, graphics);
    }
);

// Render the images into the document.
body.appendChild(originalImage.createElement());
body.appendChild(scaledImage.createElement());
```

Parameters:

`svgMarkup:` `{String | Document}`

An SVG mark-up string or an XML document.

`graphics:` {*`nokia.maps.gfx.Graphics`*} [optional]

The graphics context that is to be used for rendering; if omitted, a new context is created and then returned

Returns:

{*`nokia.maps.gfx.Graphics`*}

The graphics context that was used to render this SVG

Interface: SvgMarkupInfo

This interface is a member of ***`nokia.maps.gfx.SvgParser`***.

www.EngineeringBooksPdf.com

Interface Summary

This is an abstract interface for documentation purpose only.

[*For full details, see nokia.maps.gfx.SvgParser.SvgMarkupInfo*]

Table 72: Property Summary

Properties
document : {Document} This property hols the XML document containing the definition of the SVG image.
height : {Number} This property hols the height of the SVG image in pixels.
width : {Number} This property hols the width of the SVG image in pixels.

Interface Description

This is an abstract interface for documentation purpose only. The class provides the information returned by the method *nokia.maps.gfx.SvgParser#parseSvgInfo*( ).

Property Details

document: {Document}

This property hols the XML document containing the definition of the SVG image.

height: {Number}

This property hols the height of the SVG image in pixels.

width: {Number}

This property hols the width of the SVG image in pixels.

Class: VmlPainter

This class is a member of ***nokia.maps.gfx***.

Extends: *nokia.maps.gfx.Painter*

www.EngineeringBooksPdf.com

Class Summary

This class renders a IDL into VML tags.

[*For full details, see nokia.maps.gfx.VmlPainter*]

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.gfx.Painter* :

createElement, *setOpacity*, *setScale*, *updateElement*

Class Description

The class `VmlPainter` renders an instance of *`nokia.maps.gfx.IDL`* into a VML tag to be used with Internet Explorer. To instantiate this class, use the default constructor without arguments:

```
var myVmlPainter= new nokia.maps.gfx.VmlPainter();
```

Constructor Details

`nokia.maps.gfx.VmlPainter()`

This method creates a new CanvasPainter instance

Namespace: heatmap

This namespace is a member of ***`nokia.maps`***.

Namespace Summary

This namespace contains resources that allow the API user to create and manage heat maps.

Namespace Description

This namespace contains resources that allow the API user to create and manage heat maps.

Class: Overlay

This class is a member of ***`nokia.maps.heatmap`***.

Extends: *nokia.maps.map.provider.Provider*

www.EngineeringBooksPdf.com

Class Summary

This class creates heat map overlay attachable to *nokia.maps.map.Display*.

[*For full details, see nokia.maps.heatmap.Overlay*]

Table 73: Property Summary

Properties
`readonly` ***assumeValues***`: {Boolean}` This property holds a boolean value defining whether to paint assumed values in regions where no data is available.
`readonly` ***coarseness***`: {Number}` This property holds a numeric value defining the resolution reduction when producing tiles.
`readonly` ***colors***`: {nokia.maps.heatmap.Overlay.Colors}` This property holds a *nokia.maps.heatmap.Overlay.Colors* object that defines the colors of the heat map.
`readonly` ***opacity***`: {Number}` This property holds the opacity of the heat map overlay.
`readonly` ***sampleDepth***`: {Number}` This property holds a numeric value defining the number of sampling iterations the heat map renderer will perform on the data set.
`readonly` ***type***`: {String}` This property holds the type of the heat map to be generated.

Directly Inherited Properties

Inherited from class *nokia.maps.map.provider.Provider* :

description, *getInvalidationMark*, *id*, *label*, *max*, *min*

Table 74: Method Summary

Methods
addData `(data)` This method adds an array of *nokia.maps.heatmap.Overlay.DataPoint*s to the given heat map.
clear `()` This method removes all data from the given heat map provider.

Directly Inherited Methods

www.EngineeringBooksPdf.com

Inherited from class *nokia.maps.map.provider.Provider* :

getCopyrights, *providesLevel*, *shutdown*, *update*

Inherited from class *nokia.maps.util.EventTarget* :

addListener, *dispatch*, *removeListener*

Event Summary

Directly Inherited Events

Inherited from class *nokia.maps.map.provider.Provider* :

response, *update*

Class Description

This class creates tiles to visualize value-based or density-based heat maps. User can choose between density and value based heat map.

Constructor Details

`nokia.maps.heatmap.Overlay``(options)`

This method creates an empty heat map overlay.

Parameters:

`options`:	{*`nokia.maps.heatmap.Overlay.Options`*} [optional]
	An object specifying settings for the new heat map overlay instance

Property Details

`readonly` **`assumeValues`**`: {Boolean}`

This property holds a boolean value defining whether to paint assumed values in regions where no data is available. This is especially useful for value maps which are generated from a small data sets as tiles with no available data will be filled with the next available average value in the data set.

The property is read only and can be set at construction time as part of the *nokia.maps.heatmap.Overlay.Options* initialization properties.

Default Value:	`false`

www.EngineeringBooksPdf.com

`readonly` **`coarseness`**: {Number}

This property holds a numeric value defining the resolution reduction when producing tiles. If the coarseness is set to 0 tiles will be produced in the original resolution. A coarseness of 1 allows the renderer to render tiles at half the size and then scale the output, a coarseness of 2 allows the renderer to create tiles at a size of a quarter of the original tile size. Increasing the number dramatically increases performance but also reduces visual quality, especially when using posterization (non-interpolated colors). Values may range between 0 and 3.

The property is read only and can be set at construction time as part of the *nokia.maps.heatmap.Overlay.Options* initialization properties.

Default Value: `1`

`readonly` **`colors`**: {*nokia.maps.heatmap.Overlay.Colors*}

This property holds a *nokia.maps.heatmap.Overlay.Colors* object that defines the colors of the heat map.

The property is read only and can be set at construction time as part of the *nokia.maps.heatmap.Overlay.Options* initialization properties.

`readonly` **`opacity`**: {Number}

This property holds the opacity of the heat map overlay. Values may range from 0+ to 1, inclusive.

The property is read only and can be set at construction time as part of the *nokia.maps.heatmap.Overlay.Options* initialization properties.

Default Value: `0.8`

`readonly` **`sampleDepth`**: {Number}

This property holds a numeric value defining the number of sampling iterations the heat map renderer will perform on the data set. Each iteration will sample the data more finely. Higher values will create more detailed maps but also cost performance. Values may range between 1 and 8.

The property is read only and can be set at construction time as part of the *nokia.maps.heatmap.Overlay.Options* initialization properties.

Default Value: `4`

www.EngineeringBooksPdf.com

`readonly` **`type`**`: {String}`

This property holds the type of the heat map to be generated.

The property is read only and can be set at construction time as part of the *nokia.maps.heatmap.Overlay.Options* initialization properties.

The possible values are:

- `"density"`
- `"value"`

Default Value: `"density"`

Method Details

`addData``(data)`

This method adds an array of *nokia.maps.heatmap.Overlay.DataPoint*s to the given heat map. The heat map provides a visual representation of these data.

Note that there is a significant performance cost to adding and removing data, once an overlay has been created. This is related to the rendering engine and tile caching. If you wish to add data after tiles have been created, the cache must be cleared and all tiles need to be recreated. For this reason, heat maps should not be used to create fast animations.

Parameters:

`data`: {*`nokia.maps.heatmap.Overlay.DataPoint`*`[]}`

The array of data points to be added to the overlay.

Example:

```
 // Create a density heat map overlay:
var myHeatMapOverlay = new nokia.maps.heatmap.Overlay();

// Add DataPoints:
myHeatMapOverlay.addData([
    {latitude: 50, longitude: 13},
    {latitude: 50, longitude: 13.1},
    {latitude: 51, longitude: 13.2},
    {latitude: 49.9, longitude: 13.15},
    ...
    {latitude: 50, longitude: 13.4}
]);
```

www.EngineeringBooksPdf.com

```
// Add the overlay to the map display to make
// the heat map visible:
myDisplay.overlays.add(myHeatMapOverlay);
```

`clear()`

This method removes all data from the given heat map provider. New data can be provided using the *nokia.maps.heatmap.Overlay#addData* method.

Interface: Colors

This interface is a member of ***`nokia.maps.heatmap.Overlay`***.

Interface Summary

This interface defines a standard way to customize the colors displayed in a heat map by associating custom colors with normalized "heat" values.

[*For full details, see nokia.maps.heatmap.Overlay.Colors*]

Table 75: Property Summary

Properties
`interpolate``: {Boolean}` This property is a flag indicating whether interpolation is to be used to display smooth color transitions in the heat map (`true`) or whether the heat map is to be posterized (`false`).
`stops``: {Object}` This property holds a map, where the keys are numbers ranging from 0 to 1, inclusive, and the corresponding values are the colors defined in the hexadecimal Web color notation, including opacity.

Interface Description

This interface defines a standard way to customize the colors displayed in a heat map by associating custom colors with normalized "heat" values.

The interface associates colors with "heat" values via the "stops" property. This property is a map, where the keys are numbers ranging from 0 to 1, inclusive, and the values are colors associated with these numeric values. The colors are represented using CSS colors, i.e. hexadecimal notation ("#RGB" or "#RRGGBB") or rgb(a) notation ("rgba(R, G, B, A)"), etc. The range (0 .. 1) stands for the normalized "heat" value. Points on the heat map are colorized using the color-stops information from the `Colors` object.

www.EngineeringBooksPdf.com

Property Details

`interpolate`: `{Boolean}`

This property is a flag indicating whether interpolation is to be used to display smooth color transitions in the heat map (`true`) or whether the heat map is to be posterized (`false`).

`stops`: `{Object}`

This property holds a map, where the keys are numbers ranging from 0 to 1, inclusive, and the corresponding values are the colors defined in the hexadecimal Web color notation, including opacity.

Interface: DataPoint

This interface is a member of ***`nokia.maps.heatmap.Overlay`***.

Interface Summary

This interface represents a single data point that can be visualized in a heat map.

[*For full details, see nokia.maps.heatmap.Overlay.DataPoint*]

Table 76: Property Summary

Properties
`latitude`: `{Number}` This property defines the latitude of this data point.
`longitude`: `{Number}` This property defines the longitude of this data point.
`value`: `{Number}` This property defines a numeric "heat" value associated with the given data point.

Interface Description

This interface represents a single data point that can be visualized in a heat map. It consists of the geographic coordinates defining its position and an optional value to be associated with this position.

Property Details

`latitude`: `{Number}`

www.EngineeringBooksPdf.com

This property defines the latitude of this data point.

longitude: {Number}

This property defines the longitude of this data point.

value: {Number}

This property defines a numeric "heat" value associated with the given data point. If no value is defined, the default is 1.

Default Value: 1

Interface: Options

This interface is a member of ***nokia.maps.heatmap.Overlay***.

Interface Summary

This interface defines options that can be passed to the *nokia.maps.heatmap.Overlay* constructor.

[*For full details, see nokia.maps.heatmap.Overlay.Options*]

Table 77: Property Summary

Properties
assumeValues: {Boolean} This property holds a boolean value defining whether to paint assumed values in regions where no data is available.
coarseness: {Number} This property holds a numeric value defining the resolution reduction when producing tiles.
colors: {*nokia.maps.heatmap.Overlay.Colors*} This property holds an object that conforms to the interface *nokia.maps.heatmap.Overlay.Colors* and is used to define the colors of the heat map.
opacity: {Number} This property holds the opacity of the heat map overlay.
sampleDepth: {Number} This property holds a numeric value defining the number of sampling iterations the heat map renderer will perform on the data set.

www.EngineeringBooksPdf.com

Properties
type: {String} This property specifies the type of the heat map to be generated.

Directly Inherited Properties

Inherited from class *nokia.maps.map.provider.Provider.Options* :

description, *getCopyrights*, *label*, *max*, *min*, *updateCycle*

Interface Description

This interface defines options that can be passed to the *nokia.maps.heatmap.Overlay* constructor.

Property Details

assumeValues: {Boolean}

This property holds a boolean value defining whether to paint assumed values in regions where no data is available. This is especially useful for value maps which are generated from a small data sets as tiles with no available data will be filled with the next available average value in the data set.

Default Value: `false`

coarseness: {Number}

This property holds a numeric value defining the resolution reduction when producing tiles. If the coarseness is set to 0 tiles will be produced in the original resolution. A coarseness of 1 allows the renderer to render tiles at half the size and then scale the output, a coarseness of 2 allows the renderer to create tiles at a size of a quarter of the original tile size. Increasing the number dramatically increases performance but also reduces visual quality, especially when using posterization (non-interpolated colors). Values may range between 0 and 3.

Default Value: `1`

colors: {*nokia.maps.heatmap.Overlay.Colors*}

This property holds an object that conforms to the interface *nokia.maps.heatmap.Overlay.Colors* and is used to define the colors of the heat map. The property is optional. If it is not provided, the following default color definition is used:

www.EngineeringBooksPdf.com

```
{
  stops: {
    "0": "#008", // dark blue
    "0.2": "#0b0", // medium green
    "0.5": "#ff0", // yellow
    "0.7": "#f00" // red
  },
  interpolate: true
}
```

This means that the highest "heat" value is displayed in opaque red, the lowest as opaque blue, while values in between are shown in opaque green and yellow and interpolation is used to determine them.

`opacity`: `{Number}`

This property holds the opacity of the heat map overlay. Values may range from 0+ to 1, inclusive. The property is optional.

Default Value: `0.8`

`sampleDepth`: `{Number}`

This property holds a numeric value defining the number of sampling iterations the heat map renderer will perform on the data set. Each iteration will sample the data more finely. Higher values will create more detailed maps but also cost performance. Values may range between 1 and 8.

Default Value: `4`

`type`: `{String}`

This property specifies the type of the heat map to be generated. The property is optional.

The possible values are:

- `"density"`
- `"value"`

Default Value: `"density"`

Namespace: kml

This namespace is a member of ***`nokia.maps`***.

www.EngineeringBooksPdf.com

Namespace Summary

This namespace defines classes and methods that implement support for KML, including import of KML files.

Namespace Description

This namespace defines classes and methods that implement support for KML, including import of KML files.

Class: BalloonStyle

This class is a member of ***nokia.maps.kml***.

Class Summary

This class represents the tag <BalloonStyle> defined in the KML specification.

[*For full details, see nokia.maps.kml.BalloonStyle*]

Table 78: Property Summary

Properties
`readonly` ***displayMode***`: {String}` This property holds the default value for the balloon display mode.
`readonly` ***text***`: {String}` This property holds the default value for text displayed in the balloon.

Directly Inherited Properties

Inherited from class *nokia.maps.kml.ColorStyle* :

color, *colorMode*

Class Description

This class represents the tag <BalloonStyle> defined in the KML specification. Class specifies how the balloon containing text, etc. is drawn.

Constructor Details

`nokia.maps.kml.BalloonStyle``(node)`

www.EngineeringBooksPdf.com

The class constructor initializes a new instance of the class, using the arguments supplied by the caller.

Parameters:

node:	{Node}	An XML node from the KML document that is being parsed

Property Details

`readonly` **`displayMode`**`: {String}`

This property holds the default value for the balloon display mode. If the property is set to "default", the balloon displays text. If `displayMode` is "hide", the balloon remains hidden.

`readonly` **`text`**`: {String}`

This property holds the default value for text displayed in the balloon. You can add entities to the `text` tag using the following format to refer to a child element of Feature: `$[name]`, `$[description]`.

For example, in the following KML excerpt, the fields `$[name]` and `$[description]` are replaced by the fields `name` and `description` found in the Feature elements that use the given BalloonStyle:

```
<text>This is $[name], whose description is:<br />
$[description]</text>
```

Class: ColorStyle

This class is a member of ***`nokia.maps.kml`***.

Class Summary

This class represents the abstract <ColorStyle> tag from the KML specification.

[*For full details, see nokia.maps.kml.ColorStyle*]

Table 79: Property Summary

Properties
`readonly` ***`color`***`: {String}` This property holds the color and opacity (alpha) values expressed in hexadecimal notation.

www.EngineeringBooksPdf.com

Properties
`readonly` ***`colorMode`***`: {String}`
This property holds the value of color mode, which can be "normal" (no effect) or "random".

Class Description

This class represents the abstract <ColorStyle> tag from the KML specification.

Constructor Details

`nokia.maps.kml.ColorStyle(node)`

The constructor for this class initializes a new instance of the class, using the arguments supplied by the caller.

Parameters:

node:	{Node}	XML A node from the KML document that is being parsed

Property Details

`readonly` **`color`**`: {String}`

This property holds the color and opacity (alpha) values expressed in hexadecimal notation. The range of values for any one color is 0 to 255 (00 to ff). The order of expression is #rrggbbaa, where aa=alpha (00 to ff); bb=blue (00 to ff); gg=green (00 to ff); rr=red (00 to ff). For alpha, 00 is fully transparent and ff is fully opaque.

`readonly` **`colorMode`**`: {String}`

This property holds the value of color mode, which can be "normal" (no effect) or "random". A value of "random" applies a random linear scale to the base color as follows:

- To achieve a truly random selection of colors, specify white as the base color, #ffffffff.
- If you specify a single color component (for example, a value of #ff0000ff for red), random color values for that one component (red) are subsequently selected, ranging from 00 (black) to ff (full red).

www.EngineeringBooksPdf.com

- If you specify values for two or for all three color components, a random linear scale is applied to each color component, with results ranging from black to the maximum values specified for each component.
- The opacity of a color comes from the alpha component and is never randomized.

Class: Container

This class is a member of ***nokia.maps.kml***.

Class Summary

This class represents the abstract <Container> tag from the KML specification.

[*For full details, see nokia.maps.kml.Container*]

Table 80: Property Summary

Properties
`readonly` ***features***`: {Array}` This property holds an array of *nokia.maps.kml.Feature* elements

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.kml.ObservableNode* :

load

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This class represents the abstract <Container> tag from the KML specification. It is designed to hold other objects and allows for creation of nested hierarchies. Properties are filled asynchronously after call from ObservableNode class during XML tree parse.

Constructor Details

`nokia.maps.kml.Container``(node, styleContainer, featureStyle)`

The constructor initializes a new instance of the class with the arguments supplied by the caller.

www.EngineeringBooksPdf.com

Parameters:

node:	{Node} An XML node from the KML document which is being parsed
styleContainer:	{*nokia.maps.kml.StyleContainer*} A container holding a list of StyleSelector objects, which is a list of all global styles that can be referenced by id
featureStyle:	{*nokia.maps.kml.FeatureStyle*} A container holding locally defined styles that can be applied to the given object

Property Details

`readonly` **`features`**`: {Array}`

This property holds an array of *nokia.maps.kml.Feature* elements

Namespace: DOM

This namespace is a member of ***`nokia.maps.kml`***.

Namespace Summary

This is a static class that provides helper methods for the KML-specific classes.

Table 81: Method Summary

Methods
`static` ***`getAltitudeMode`*** `(node) : {String}` This method parses the value of an XML DOM node into a string.
`static` ***`getBoolean`*** `(node) : {Boolean}` This method parses the value of an XML DOM node to a Boolean value.
`static` ***`getColor`*** `(node) : {String}` This method parses the value of an XML DOM node to a string that represents a color in RGBA format, reversing the order, because the KML specification uses the ABGR format.
`static` ***`getFloat`*** `(node) : {Float}` This method parses the value of an XML DOM node to a Floating point number.

www.EngineeringBooksPdf.com

Methods
`static` ***`getInteger`*** `(node) : {Integer}` This method parses the value of an XML DOM node to integer.
`static` ***`getNodeAttribute`*** `(node, attributeName) : {String}` This method parses the attribute `attributeName` from an XML DOM node and returns it as a string.
`static` ***`getNodeId`*** `(node) : {String}` This method parses the attribute `id` from an XML DOM node and returns it as a string.
`static` ***`getString`*** `(node) : {String}` This method parses the value of a DOM node into string.
`static` ***`parseCoord`*** `(coordStr) : {`*`nokia.maps.geo.Coordinate`*`}` This method parses a object containing geographical coordinates from a string.
`static` ***`parseCoords`*** `(coordsString) : {`*`nokia.maps.geo.Coordinate`*`[]}` This method parses a string containing coordinates to an array of objects, each containing the properties "lat", "lng" and "alt".
`static` ***`parseFromString`*** `(node) : {Document}` This method parses an XML string into browser-independent XML Document object.

Namespace Description

This is a static class that provides helper methods for the KML-specific classes.

Method Details

`static` **`getAltitudeMode`**`(node): {String}`

This method parses the value of an XML DOM node into a string. The resulting string contains only predefined values as specified in KML documentation

Parameters:

`node:`	`{Node}` Any XML DOM node to parse

Returns:

`{String}`	One of the predefined string values

www.EngineeringBooksPdf.com

`static` **`getBoolean`**`(node): {Boolean}`

This method parses the value of an XML DOM node to a Boolean value.

Parameters:

`node:`	`{Node}` An XML DOM node to parse

Returns:

`{Boolean}`	A Boolean representation of the node value

`static` **`getColor`**`(node): {String}`

This method parses the value of an XML DOM node to a string that represents a color in RGBA format, reversing the order, because the KML specification uses the ABGR format. If parsing fails, the method returns the default hard-coded color.

Parameters:

`node:`	`{Node}` An XML DOM node to parse

Returns:

`{String}`	A string representing a color in #RGBA format

`static` **`getFloat`**`(node): {Float}`

This method parses the value of an XML DOM node to a Floating point number.

Parameters:

`node:`	`{Node}` An XML DOM node to parse

Returns:

www.EngineeringBooksPdf.com

{Float}	The value of the node as a float

static getInteger(node): {Integer}

This method parses the value of an XML DOM node to integer.

Parameters:

node:	{Node}
	An XML DOM node to parse

Returns:

{Integer}	The node value as an integer

static getNodeAttribute(node, attributeName): {String}

This method parses the attribute attributeName from an XML DOM node and returns it as a string.

Parameters:

node:	{Node}
	An XML DOM node
attributeName:	{String}
	Name of the attribute

Returns:

{String}	A string containing the nod id

static getNodeId(node): {String}

This method parses the attribute id from an XML DOM node and returns it as a string.

Parameters:

node:	{Node}

www.EngineeringBooksPdf.com

An XML DOM node

Returns:

`{String}` A string containing the node id

`static` **`getString`**`(node): {String}`

This method parses the value of a DOM node into string.

Parameters:

`node:` `{Node}`

A DOM node to parse

Returns:

`{String}` The value of the DOM node as a stripped string value

`static` **`parseCoord`**`(coordStr): {`*`nokia.maps.geo.Coordinate`*`}`

This method parses a object containing geographical coordinates from a string. If the input does not contain valid coordinates, the return value is undefined.

Parameters:

`coordStr:` `{String | String[]}`

A string containing the values of geographical coordinate as specified in KML specification, for example: "13,53.5,0" or "13,53.5" Or an Array of strings like ["13","53.5","0"] or ["13","53.5"]

Returns:

{*`nokia.maps.geo.Coordinate`*}

An object containing an object containing geographical coordinates (the properties are "lat", "lng", and "alt"

`static` **`parseCoords`**`(coordsString): {`*`nokia.maps.geo.Coordinate`*`[]}`

www.EngineeringBooksPdf.com

This method parses a string containing coordinates to an array of objects, each containing the properties "lat", "lng" and "alt". The return value contains only valid coordinates.

Parameters:

`coordsString:` `{String}`

A string containing a list of coordinates as specified in KML specification, for example: "13,53.5,0 14,53,0 13,52.5,0 14,52.5,0" or non standard comma separated list of coordinates like "13,53.5,0,14,53,0,13,52.5,0,14,52.5,0". In this case specifying altitude(3rd component in each tuple) is required. Please do not use spaces in case if you provide coordinates in 2nd format.

Returns:

`{`*`nokia.maps.geo.Coordinate`*`[]}`

A list of objects containing parsed geographical coordinates

`static` **`parseFromString`**`(node): {Document}`

This method parses an XML string into browser-independent XML Document object.

Parameters:

`node:` `{String}`

An XML string to parse

Returns:

`{Document}` An XML DOM document

Class: Document

This class is a member of ***`nokia.maps.kml`***.

Class Summary

This class represents the <Document> tag from the KML specification.

[*For full details, see nokia.maps.kml.Document*]

www.EngineeringBooksPdf.com

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.kml.Container* :

features

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.kml.ObservableNode* :

load

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This class represents the <Document> tag from the KML specification.

Constructor Details

`nokia.maps.kml.Document``(node, styleContainer, featureStyle)`

The constructor initializes a new instance of the class with the arguments supplied by the caller.

Parameters:

`node`:	`{Node}` An XML node from the KML document which is currently being parsed
`styleContainer`:	{*`nokia.maps.kml.StyleContainer`*} A list of `StyleSelector` objects containing all global styles which can be referenced by id
`featureStyle`:	{*`nokia.maps.kml.FeatureStyle`*} A list of locally defined styles which can be applied to the given object

Class: Feature

This class is a member of ***`nokia.maps.kml`***.

www.EngineeringBooksPdf.com

Extends: *nokia.maps.kml.ObservableNode*

Class Summary

This class represents the abstract <Feature> tag from KML specification.

[*For full details, see nokia.maps.kml.Feature*]

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.kml.ObservableNode* :

load

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This class represents the abstract <Feature> tag from KML specification. Properties are filled asynchronously after call from ObservableNode class during XML tree parse.

Constructor Details

`nokia.maps.kml.Feature``(node, styleContainer, featureStyle)`

The constructor initializes a new instance of the class with the arguments supplied by the caller.

Parameters:

`node`:	`{Node}`
	An XML node from a KML document that is being parsed.
`styleContainer`:	{*`nokia.maps.kml.StyleContainer`*}
	A list of `StyleSelector` objects, contains all global styles which can be referenced by id
`featureStyle`:	{*`nokia.maps.kml.FeatureStyle`*}
	An object containing locally defined styles that can be applied to the given object

www.EngineeringBooksPdf.com

Class: FeatureStyle

This class is a member of ***nokia.maps.kml***.

Class Summary

This class represents a style applicable to the class `Feature`.

[*For full details, see nokia.maps.kml.FeatureStyle*]

Table 82: Method Summary

Methods
mergeStyle `(style, highlighted, reverse)` This method merges the styles from the received arguments to the current instance.

Class Description

This class represents a style applicable to the class `Feature`.

Constructor Details

`nokia.maps.kml.FeatureStyle``(style, highlighted)`

Initialize a new instance of the class with the following parameters.

Parameters:

`style`:	{*`nokia.maps.kml.Style`* | *`nokia.maps.kml.FeatureStyle`*} This is the set of styles with to initialize the given instance of the class
`highlighted`:	{`Boolean`} [optional] A value indicating if the style is for highlighted shapes (`true`) or not (`false`); if the value is `true`, the argument `style` should be an instance of *`nokia.maps.kml.Style`*

Method Details

`mergeStyle``(style, highlighted, reverse)`

This method merges the styles from the received arguments to the current instance.

www.EngineeringBooksPdf.com

Parameters:

`style`:	{*`nokia.maps.kml.Style`* | *`nokia.maps.kml.FeatureStyle`*} An object containing the style to be merged with the given instance of this class.
`highlighted`:	{`Boolean`} [optional] A value indicating if the style is for highlighted shapes (`true`) or not (`false`); if the value is `true`, the argument `style` should be an instance of *`nokia.maps.kml.Style`*
`reverse`:	{`Boolean`} Specifies priority of the merging operation.

Class: Folder

This class is a member of ***`nokia.maps.kml`***.

Class Summary

This class represents the <Folder> tag from the KML specification.

[*For full details, see nokia.maps.kml.Folder*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.kml.Container* :

features

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.kml.ObservableNode* :

load

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

www.EngineeringBooksPdf.com

Class Description

This class represents the <Folder> tag from the KML specification.

Constructor Details

`nokia.maps.kml.Folder``(node, styleContainer, featureStyle)`

The constructor initializes a new instance of the class, using the arguments provided by the caller.

Parameters:

`node:`	`{Node}`
	An XML node from KML document, which is currently parsed.
`styleContainer:`	{*`nokia.maps.kml.StyleContainer`*}
	A list of `StyleSelector` objects, contains all global styles that can be referenced by id
`featureStyle:`	{*`nokia.maps.kml.FeatureStyle`*}
	Contains locally defined styles which can be applied to the given object

Class: Geometry

This class is a member of ***`nokia.maps.kml`***.

Extends: *nokia.maps.kml.ObservableNode*

Class Summary

This class represents the abstract <Geometry> tag from the KML specification.

[*For full details, see nokia.maps.kml.Geometry*]

Table 83: Property Summary

Properties
`readonly` ***`weight`***`: {Number}`
"Weight" of the geometry.

www.EngineeringBooksPdf.com

Table 84: Method Summary

Methods
getCenterCoordinate `() : {nokia.maps.geo.Coordinate}` This method calculates the arithmetic average of all coordinates.
getStyle `() : {nokia.maps.kml.Style}` Returns the style of the Geometry as a set of properties which can be used while creating equivalent map object

Directly Inherited Methods

Inherited from class *nokia.maps.kml.ObservableNode* :

load

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This class represents the abstract <Geometry> tag from the KML specification.

Constructor Details

`nokia.maps.kml.Geometry``(node)`

The constructor initializes a new instance of the class, using the arguments provided by the caller.

Parameters:

node:	`{Node}`	An XML node from KML document, which is currently parsed.

Property Details

`readonly` **`weight`**`: {Number}`

"Weight" of the geometry. This attribute is used to measure how heavy geometries are. For example if it is a polyline with 100 connection points, its weight is 100, and if it is a simple point object, than it has a weight of 1.

Default Value: `0`

www.EngineeringBooksPdf.com

Method Details

`getCenterCoordinate``(): {`*`nokia.maps.geo.Coordinate`*`}`

This method calculates the arithmetic average of all coordinates.

Returns:

{*`nokia.maps.geo.Coordinate`*}

An instance of `nokia.maps.geo.Coordinate` representing the calculated average

Throws:

`{NotImplementedException}` When trying to create object of this class and call this method.

`getStyle``(): {`*`nokia.maps.kml.Style`*`}`

Returns the style of the Geometry as a set of properties which can be used while creating equivalent map object

Returns:

{*`nokia.maps.kml.Style`*}

An object containing style properties to draw the given object on map

Throws:

`{NotImplementedException}` When trying to create object of this class and call this method.

Class: Icon

This class is a member of ***`nokia.maps.kml`***.

Class Summary

This class represents the <Icon> tag from the KML specification.

[*For full details, see nokia.maps.kml.Icon*]

www.EngineeringBooksPdf.com

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.kml.Link* :

href

Class Description

This class represents the <Icon> tag from the KML specification.

Constructor Details

`nokia.maps.kml.Icon``(node)`

The constructor initializes a new instance of the class, using the arguments provided by the caller.

Parameters:

node:	{Node}
	An XML node from the KML document that is being parsed

Class: IconStyle

This class is a member of ***`nokia.maps.kml`***.

Class Summary

This class represents the <IconStyle> tag from the KML specification.

[*For full details, see nokia.maps.kml.IconStyle*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.kml.ColorStyle* :

color, *colorMode*

Class Description

This class represents the <IconStyle> tag from the KML specification.

www.EngineeringBooksPdf.com

Constructor Details

nokia.maps.kml.IconStyle(node)

The constructor initializes a new instance of the class, using the arguments provided by the caller.

Parameters:

node: {Node}

An XML node from the KML document which is currently being parsed.

Class: LabelStyle

This class is a member of ***nokia.maps.kml***.

Class Summary

This class represents the <LabelStyle> tag from the KML specification.

[*For full details, see nokia.maps.kml.LabelStyle*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.kml.ColorStyle* :

color, *colorMode*

Class Description

This class represents the <LabelStyle> tag from the KML specification.

Constructor Details

nokia.maps.kml.LabelStyle(node)

The constructor initializes a new instance of the class, using the arguments provided by the caller.

Parameters:

node: {Node}

An XML node from the KML document which is currently being parsed

www.EngineeringBooksPdf.com

Class: LineString

This class is a member of ***nokia.maps.kml***.

Extends: *nokia.maps.kml.Geometry*

Class Summary

This class represents the <LineString> tag from the KML specification.

[*For full details, see nokia.maps.kml.LineString*]

Table 85: Property Summary

Properties
`readonly` ***coordinates***: {*nokia.maps.geo.Coordinate*[]} An array containing *nokia.maps.geo.Coordinate* objects.

Directly Inherited Properties

Inherited from class *nokia.maps.kml.Geometry* :

weight

Table 86: Method Summary

Methods
getCenterCoordinate () : {*nokia.maps.geo.Coordinate* | null} This method calculates the arithmetic average of all coordinates.
getStyle () : {Object} This method gets the styles for the given object.

Directly Inherited Methods

Inherited from class *nokia.maps.kml.Geometry* :

getCenterCoordinate, *getStyle*

Inherited from class *nokia.maps.kml.ObservableNode* :

load

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

www.EngineeringBooksPdf.com

Class Description

This class represents the <LineString> tag from the KML specification.

Constructor Details

nokia.maps.kml.LineString(node, lineStyle, balloonStyle)

The constructor initializes a new instance of the class, using the arguments provided by the caller.

Parameters:

node:	{Node} An XML node from the KML document, which is currently being parsed
lineStyle:	{*nokia.maps.kml.LineStyle*} An object representing the line style to use during conversion to a map object
balloonStyle:	{*nokia.maps.kml.BalloonStyle*} An object representing the balloon style to use during conversion to a map object

Property Details

readonly **coordinates**: {*nokia.maps.geo.Coordinate*[]}

An array containing *nokia.maps.geo.Coordinate* objects.

A KML file must include four or more tuples, each consisting of floating point values for longitude, latitude, and altitude. The altitude component is optional. Do not include spaces within a tuple. The last coordinate must be the same as the first coordinate. Coordinates are expressed in decimal degrees only.

It is important to bear in mind that when parsing of coordinates from a KML file has failed, or fewer than 4 points were specified, this array remains empty.

Method Details

getCenterCoordinate(): {*nokia.maps.geo.Coordinate* | null}

This method calculates the arithmetic average of all coordinates. This method contains an implementation of *nokia.maps.kml.Geometry#getCenterCoordinate*.

www.EngineeringBooksPdf.com

Returns:

{*nokia.maps.geo.Coordinate*
| null}

An instance of `nokia.maps.geo.Coordinate` representing the calculated average, or `null` if *nokia.maps.kml.LineString#coordinates* was empty

`getStyle(): {Object}`

This method gets the styles for the given object. This method contains an implementation of *nokia.maps.kml.Geometry#getStyle*.

Returns:

`{Object}` An object with properties "color" and "width".

Class: LineStyle

This class is a member of ***`nokia.maps.kml`***.

Class Summary

This class represents the <LineStyle> tag from the KML specification.

[*For full details, see nokia.maps.kml.LineStyle*]

Table 87: Property Summary

Properties
`static` ***`DEFAULT_STROKE_COLOR`***`: {String}` Default stroke color for KML line object
`static` ***`DEFAULT_STROKE_WIDTH`***`: {Number}` Default stroke width for KML line object

Directly Inherited Properties

Inherited from class *nokia.maps.kml.ColorStyle* :

color, *colorMode*

www.EngineeringBooksPdf.com

Class Description

This class represents the <LineStyle> tag from the KML specification.

Constructor Details

nokia.maps.kml.LineStyle(node)

The constructor initializes a new instance of the class, using the arguments provided by the caller.

Parameters:

node:	{Node}
	An XML node from KML document which is currently being parsed

Property Details

static **DEFAULT_STROKE_COLOR**: {String}

Default stroke color for KML line object

Default Value: #000000ff

static **DEFAULT_STROKE_WIDTH**: {Number}

Default stroke width for KML line object

Default Value: 1

Class: LinearRing

This class is a member of ***nokia.maps.kml***.

Extends: *nokia.maps.kml.Geometry*

Class Summary

This class represents the <LinearRing> tag from the KML specification.

[*For full details, see nokia.maps.kml.LinearRing*]

www.EngineeringBooksPdf.com

Table 88: Property Summary

Properties
`readonly` ***coordinates***: {*nokia.maps.geo.Coordinate*[]} An array containing *nokia.maps.geo.Coordinate*s.

Directly Inherited Properties

Inherited from class *nokia.maps.kml.Geometry* :

weight

Table 89: Method Summary

Methods
getCenterCoordinate () : {*nokia.maps.geo.Coordinate* | null} This method calculates the arithmetic average of all coordinates.
getStyle () : {Object} This method gets the styles for the given object.

Directly Inherited Methods

Inherited from class *nokia.maps.kml.Geometry* :

getCenterCoordinate, *getStyle*

Inherited from class *nokia.maps.kml.ObservableNode* :

load

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This class represents the <LinearRing> tag from the KML specification.

Constructor Details

`nokia.maps.kml.LinearRing``(node, lineStyle, balloonStyle)`

The constructor initializes a new instance of the class, using the arguments provided by the caller.

Parameters:

www.EngineeringBooksPdf.com

node:	{Node} An XML node from the KML document which is currently being parsed
lineStyle:	{*nokia.maps.kml.LineStyle*} An object representing the line style to use during conversion to a map object
balloonStyle:	{*nokia.maps.kml.BalloonStyle*} An object representing the balloon style to use during conversion to a map object

Property Details

`readonly` **`coordinates`**: {*nokia.maps.geo.Coordinate*[]}

An array containing *nokia.maps.geo.Coordinate*s.

A KML file is required to have four or more tuples, each consisting of floating point values for longitude, latitude, and altitude. The altitude component is optional. Do not include spaces within a tuple. The last coordinate must be the same as the first coordinate. Coordinates are expressed in decimal degrees only.

It is important to bear in mind that when parsing of coordinates from a KML file has failed, or fewer than 4 points were specified, this array remains empty.

Method Details

`getCenterCoordinate`(): {*nokia.maps.geo.Coordinate* | null}

This method calculates the arithmetic average of all coordinates. This method contains an implementation of *nokia.maps.kml.Geometry#getCenterCoordinate*.

Returns:

{*nokia.maps.geo.Coordinate*
| null}

An instance of `nokia.maps.geo.Coordinate` representing the calculated average, or `null` if *nokia.maps.kml.LinearRing#coordinates* was empty

`getStyle`(): {Object}

www.EngineeringBooksPdf.com

This method gets the styles for the given object. This method contains an implementation of *nokia.maps.kml.Geometry#getStyle*.

Returns:

`{Object}`	An object with properties "color" and "width".

Class: Link

This class is a member of ***nokia.maps.kml***.

Class Summary

This class represents the <Link> tag from the KML specification.

[*For full details, see nokia.maps.kml.Link*]

Table 90: Property Summary

Properties
`readonly` ***href***`: {String}` A URL (either an HTTP address or a local file specification).

Class Description

This class represents the <Link> tag from the KML specification.

Constructor Details

`nokia.maps.kml.Link``(node)`

The constructor initializes a new instance of the class, using the arguments provided by the caller.

Parameters:

node:	`{Node}`	An XML node from the KML document that is currently being parsed

Property Details

`readonly` **`href`**`: {String}`

www.EngineeringBooksPdf.com

A URL (either an HTTP address or a local file specification). Relative URLs can be used in this tag and are evaluated relative to the enclosing KML file.

Class: Manager

This class is a member of ***nokia.maps.kml***.

Extends: *nokia.maps.util.OObject*

Class Summary

This class submits XHR requests for KML files and parses a KML document.

[*For full details, see nokia.maps.kml.Manager*]

Table 91: Property Summary

Properties
kmlDocument: {*nokia.maps.kml.Document*} This property holds the parsed KML document.
path: {String} This property holds the path from which kml documented have been fetched
state: {String} This property holds the state of the request sent by the given manager instance.

Table 92: Method Summary

Methods
parse (doc) This method parses a KML document, using the styles, style maps and placemarks defined in the document to create geometries.
parseKML (String) This method submits an XMLHTTPRequest and parses the KML document received in response.

Directly Inherited Methods

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

www.EngineeringBooksPdf.com

Class Description

This class submits XHR requests for KML files and parses a KML document.

Constructor Details

`nokia.maps.kml.Manager()`

This method initializes a new instance of the class, setting its state property to "initial" and resetting the KML document property to `null`.

Property Details

`kmlDocument`: {*`nokia.maps.kml.Document`*}

This property holds the parsed KML document. You can observe the property `nokia.maps.kml.Manager#state`: if its value is "finished", then `kmlDocument` can be accessed, otherwise `kmlDocument` is undefined.

`path`: {`String`}

This property holds the path from which kml documented have been fetched

`state`: {`String`}

This property holds the state of the request sent by the given manager instance. The possible values are: "initial", "started", "loaded" "finished", "failed".

Method Details

`parse(doc)`

This method parses a KML document, using the styles, style maps and placemarks defined in the document to create geometries.

Parameters:

doc:	{`Document`}	A KML document that to be parsed

www.EngineeringBooksPdf.com

parseKML(String)

This method submits an XMLHTTPRequest and parses the KML document received in response.

Parameters:

String:

path A URL link to the KML file

Class: MultiGeometry

This class is a member of ***nokia.maps.kml***.

Extends: *nokia.maps.kml.Geometry*

Class Summary

This class represents the <MultiGeometry> tag from KML specification.

[*For full details, see nokia.maps.kml.MultiGeometry*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.kml.Geometry* :

weight

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.kml.Geometry* :

getCenterCoordinate, *getStyle*

Inherited from class *nokia.maps.kml.ObservableNode* :

load

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

here

www.EngineeringBooksPdf.com

Class Description

The class is a container for zero or more geometry primitives associated with the same feature.

Constructor Details

nokia.maps.kml.MultiGeometry(node, featureStyle, balloonStyle, placemark)

Initialize a new instance of the class with the following parameters.

Parameters:

node:	{Node}
	An XML node from KML document, which is currently parsed
featureStyle:	{*nokia.maps.kml.FeatureStyle*}
	A container with locally defined styles which can be applied to the given object
balloonStyle:	{*nokia.maps.kml.BalloonStyle*}
	Specifies how the description balloon for placemark is drawn.
placemark:	{*nokia.maps.kml.Placemark*}
	Placemark object containing this multigeometry

Class: Object

This class is a member of ***nokia.maps.kml***.

Class Summary

This class represents the abstract <Object> tag from KML specification.

[*For full details, see nokia.maps.kml.Object*]

Class Description

This class represents the abstract <Object> tag from KML specification.

Constructor Details

nokia.maps.kml.Object(node)

www.EngineeringBooksPdf.com

Initialize a new instance of the class with the following parameters.

Parameters:

node: {Node}

An XML node from KML document, which is currently parsed.

Class: ObservableNode

This class is a member of ***nokia.maps.kml***.

Extends: *nokia.maps.util.OObject*

Class Summary

This mixin is used for asynchronous parsing of XML elements in *nokia.maps.kml.Feature* and *nokia.maps.kml.Geometry*.

[*For full details, see nokia.maps.kml.ObservableNode*]

Table 93: Method Summary

Methods
load `(onReadyCallback, parentNode)` This method recursively parses a node and all its child nodes.

Directly Inherited Methods

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This class is used as a mixin in *nokia.maps.kml.Feature* and *nokia.maps.kml.Geometry*, and for asynchronous parsing of the XML document containing KML data. Sometimes KML nodes can be very large (for example, a folder node may contain 2000 placemarks). Synchronous parsing of such nodes can cause the "Script running slow..." alert to appear. Thus, nodes that by their nature and according to the *KML OGC specification* cannot contain too many child nodes are parsed synchronously (those nodes are called "leaf" nodes, for example <Point> in KML). All other intermediate nodes starting from the <kml> tag in an XML document are parsed asynchronously.

During parsing, for each KML node supported by the Maps API, its equivalent is created. For example, each `Folder` tag is found in a document, results in an instance of the *nokia.maps.kml.Folder*

www.EngineeringBooksPdf.com

class, which is derived from this class, thus it has the ability to parse and create its child tags asynchronously. The parsing procedure starts by calling the `load()` method. Each instance of this class has state, whose value at instantiation is set to `initial`. When `load()` is called for a "leaf" node, its state is set to `ready`. The state of the parent node is set to `ready` when all its child nodes are `ready`. Thus, when the *nokia.maps.kml.Document* class instance representing the <kml> tag from XML has the state "ready", the entire XML document parsing has been completed.

Constructor Details

`nokia.maps.kml.ObservableNode``(node)`

The constructor initializes a new instance of the class using the arguments provided by the caller.

Parameters:

`node:`	`{Node}`
	An XML node from the KML document to parse

Method Details

`load``(onReadyCallback, parentNode)`

This method recursively parses a node and all its child nodes. Parsing uses *nokia.maps.util.Coroutine*.

Parameters:

`onReadyCallback:`	`{Function}`
	A callback function which is called as soon as the node state is "ready"
`parentNode:`	`{Node}`
	Reference to the parent node

Class: Pair

This class is a member of ***`nokia.maps.kml`***.

Class Summary

This class represents the <Pair> tag from the KML specification.

[*For full details, see nokia.maps.kml.Pair*]

www.EngineeringBooksPdf.com

Table 94: Method Summary

Methods
getStyle () : {*nokia.maps.kml.Style*} This method retrieves the styles for the given object.

Class Description

This class represents the <Pair> tag from the KML specification.

Constructor Details

nokia.maps.kml.Pair(node, styleContainer)

The constructor initializes a new instance of the class, using the arguments provided by the caller.

Parameters:

node:	{Node} An XML node from the KML document that is currently being parsed
styleContainer:	{*nokia.maps.kml.StyleContainer*} A list of StyleSelector objects, this is a list of all global styles which can be referenced by id

Method Details

getStyle(): {*nokia.maps.kml.Style*}

This method retrieves the styles for the given object.

Returns:

{*nokia.maps.kml.Style*}

A style object, or null if no style is defined

Class: Placemark

This class is a member of ***nokia.maps.kml***.

www.EngineeringBooksPdf.com

Class Summary

This class represents the <Placemark> tag from the KML specification.

[*For full details, see nokia.maps.kml.Placemark*]

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.kml.ObservableNode* :

load

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This class represents the <Placemark> tag from the KML specification.

Constructor Details

`nokia.maps.kml.Placemark``(node, styleContainer, featureStyle)`

The constructor initializes a new instance of the class, using the arguments provided by the caller.

Parameters:

`node:`	`{Node}` An XML node from the KML document that is currently being parsed
`styleContainer:`	{*`nokia.maps.kml.StyleContainer`*} A list of `StyleSelector` objects, which is a list of all global styles which can be referenced by id
`featureStyle:`	{*`nokia.maps.kml.FeatureStyle`*} A container with locally defined styles which can be applied to the given object

Class: Point

This class is a member of ***`nokia.maps.kml`***.

www.EngineeringBooksPdf.com

Extends: *nokia.maps.kml.Geometry*

Class Summary

This class represents the <Point> tag from the KML specification.

[*For full details, see nokia.maps.kml.Point*]

Table 95: Property Summary

Properties
`readonly` ***`coordinate`***`: {nokia.maps.geo.Coordinate}` This property holds position of the point.
`readonly` ***`weight`***`: {Number}` Weight of the point geometry is 1, because it represents 1 single coordinate on the map

Directly Inherited Properties

Inherited from class *nokia.maps.kml.Geometry* :

weight

Table 96: Method Summary

Methods
`getCenterCoordinate` `() : {nokia.maps.geo.Coordinate}` This method returns an object containing the geographical coordinates of a point.
`getStyle` `() : {Object}` This method retrieves the styles for the given object.

Directly Inherited Methods

Inherited from class *nokia.maps.kml.Geometry* :

getCenterCoordinate, *getStyle*

Inherited from class *nokia.maps.kml.ObservableNode* :

load

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

www.EngineeringBooksPdf.com

Class Description

This class represents the <Point> tag from the KML specification.

Constructor Details

`nokia.maps.kml.Point``(node, iconStyle, iconStyle, balloonStyle)`

The constructor initializes a new instance of the class, using the arguments provided by the caller.

Parameters:

`node`:	`{Node}`
	An XML node from the KML document that is currently being parsed
`iconStyle`:	{*`nokia.maps.kml.IconStyle`*}
	An object representing the icon style to be used during conversion to a map object
`iconStyle`:	{*`nokia.maps.kml.IconStyle`*}
	An object representing the style for a highlighted icon; to be used to highlight the object when we mouse over them
`balloonStyle`:	{*`nokia.maps.kml.BalloonStyle`*}
	An object representing the balloon style to use during conversion to a map object

Property Details

`readonly` **`coordinate`**`:` {*`nokia.maps.geo.Coordinate`*}

This property holds position of the point.

In a KML file, please specify only a single tuple consisting of floating point values for longitude, latitude, and altitude (in that order). Longitude and latitude values are in degrees, where:

- longitude >= -180 and <= 180
- latitude >= -90 and <= 90
- altitude values (optional) are in meters above sea level

Note that you should not include spaces between the property name-value pairs when defining an instance of `nokia.maps.geo.Coordinate`.

www.EngineeringBooksPdf.com

`readonly` **`weight`**`: {Number}`

Weight of the point geometry is 1, because it represents 1 single coordinate on the map

Method Details

`getCenterCoordinate``(): {`*`nokia.maps.geo.Coordinate`*`}`

This method returns an object containing the geographical coordinates of a point. If the KML file contains more than one coordinate tuple, then first one is returned. This method implements *nokia.maps.kml.Geometry#getCenterCoordinate*.

Returns:

{*`nokia.maps.geo.Coordinate`*}

returns An object containing the geographical coordinates of a point converted from the received string or `undefined` if the conversion finishes unsuccessfully

`getStyle``(): {Object}`

This method retrieves the styles for the given object. This method implements *nokia.maps.kml.Geometry#getStyle*.

Returns:

`{Object}` An object whose properties reflect the style attributes set on the given object; the properties may include "scale", "offsetX", "offsetY", "offsetXUnits" "offsetYUnits", "icon", "offsetXHighlighted", "offsetYHighlighted", "offsetXHighlightedUnits", "offsetYHighlightedUnits", "iconHighlighted"

Class: PolyStyle

This class is a member of ***`nokia.maps.kml`***.

Class Summary

This class represents the <PolyStyle> tag from KML specification.

[*For full details, see nokia.maps.kml.PolyStyle*]

www.EngineeringBooksPdf.com

Table 97: Property Summary

Properties
`readonly` ***`fill`***`: {Boolean}` This property holds a Boolean value which specifies whether to fill the polygon.
`readonly` ***`outline`***`: {Boolean}` This property holds a Boolean value which specifies whether to draw the outline of the polygon.

Directly Inherited Properties

Inherited from class *nokia.maps.kml.ColorStyle* :

color, *colorMode*

Class Description

This class represents the <PolyStyle> tag from KML specification.

Constructor Details

`nokia.maps.kml.PolyStyle``(node)`

The constructor initializes a new instance of the class, using the arguments provided by the caller.

Parameters:

node:	{Node}	An XML node from the KML document that is currently being parsed.

Property Details

`readonly` **`fill`**`: {Boolean}`

This property holds a Boolean value which specifies whether to fill the polygon. By default it is `true`.

`readonly` **`outline`**`: {Boolean}`

This property holds a Boolean value which specifies whether to draw the outline of the polygon. By default it is `true`.

www.EngineeringBooksPdf.com

Class: Polygon

This class is a member of ***nokia.maps.kml***.

Extends: *nokia.maps.kml.Geometry*

Class Summary

This class represents the <Polygon> tag from the KML specification.

[*For full details, see nokia.maps.kml.Polygon*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.kml.Geometry* :

weight

Table 98: Method Summary

Methods
getCenterCoordinate `() : {nokia.maps.geo.Coordinate}` This method calculates an arithmetic average of all coordinates.This method contains an implementation of *nokia.maps.kml.Geometry#getCenterCoordinate*.
getPathOuter `() : {nokia.maps.geo.Coordinate[]}` This method converts the KML property "outerBoundaryIs" to an array of ***nokia.maps.geo.Coordinate*** objects.
getStyle `() : {Object}` This method retrieves the styles for the given object.

Directly Inherited Methods

Inherited from class *nokia.maps.kml.Geometry* :

getCenterCoordinate, *getStyle*

Inherited from class *nokia.maps.kml.ObservableNode* :

load

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

www.EngineeringBooksPdf.com

Class Description

This class represents the <Polygon> tag from the KML specification.

Constructor Details

nokia.maps.kml.Polygon(node, polyStyle, balloonStyle)

The constructor initializes a new instance of the class, using the arguments provided by the caller.

Parameters:

node:	{Node}
	An XML node from the KML document that is currently being parsed
polyStyle:	{*nokia.maps.kml.PolyStyle*}
	An object representing the style to use during conversion to a map object
balloonStyle:	{*nokia.maps.kml.BalloonStyle*}
	An object representing the balloon style to be used during conversion to a map object

Method Details

getCenterCoordinate(): {*nokia.maps.geo.Coordinate*}

This method calculates an arithmetic average of all coordinates.This method contains an implementation of *nokia.maps.kml.Geometry#getCenterCoordinate*.

Returns:

{*nokia.maps.geo.Coordinate*}

An instance of nokia.maps.geo.Coordinate containing the averaged coordinates

getPathOuter(): {*nokia.maps.geo.Coordinate*[]}

This method converts the KML property "outerBoundaryIs" to an array of *nokia.maps.geo.Coordinate* objects.

Returns:

www.EngineeringBooksPdf.com

{*nokia.maps.geo.Coordinate*[]}

Returns an array of *nokia.maps.geo.Coordinate* objects or null if the property "outerBoundaryIs" is absent

getStyle(): {Object}

This method retrieves the styles for the given object. The color and width are not set in the KML file. This method contains an implementation of *nokia.maps.kml.Geometry#getStyle*.

Returns:

{Object} An object with properties "color", "width", "fillColor" and "strokeColor".

Class: Style

This class is a member of ***nokia.maps.kml***.

Class Summary

This class represents the <Style> tag from KML specification.

[*For full details, see nokia.maps.kml.Style*]

Table 99: Method Summary

Methods
getStyle () : {*nokia.maps.kml.Style*} This method gets the style represented by the given object.

Class Description

This class represents the <Style> tag from KML specification.

Constructor Details

nokia.maps.kml.Style(node)

Initialize a new instance of the class with the following parameters.

Parameters:

node: {Node}

www.EngineeringBooksPdf.com

An XML node from KML document, which is currently parsed.

Method Details

`getStyle(): {nokia.maps.kml.Style}`

This method gets the style represented by the given object..

Returns:

{*nokia.maps.kml.Style*}

A reference to the given instance of the class (`this`)

Class: StyleContainer

This class is a member of ***`nokia.maps.kml`***.

Class Summary

This class contains an array of *`nokia.maps.kml.StyleSelector`* objects.

[*For full details, see nokia.maps.kml.StyleContainer*]

Table 100: Method Summary

Methods
`getStyleById` `(id, highlighted) : {`*`nokia.maps.kml.Style`*`}` This method gets the concrete `nokia.maps.kml.Style` for the `nokia.maps.kml.StyleSelector` matching the id provided by the caller
`getStyles` `() : {`*`nokia.maps.kml.StyleSelector`*`[]}` This method gets the internal array of `nokia.maps.kml.StyleSelector`
`push` `(style) : {Object}` This method adds new element to the internal array.

Class Description

This class contains an array of *`nokia.maps.kml.StyleSelector`* objects. It is mainly used for holding the global styles on which the attribute `id` is set. If a style does not have the `id` attribute, it is not added to the array neither in the constructor nor in the `push()` method.

www.EngineeringBooksPdf.com

Constructor Details

nokia.maps.kml.StyleContainer(style)

Initialize a new instance of the class with the following parameters.

Parameters:

style:	{*nokia.maps.kml.StyleSelector*} [optional]
	An instance of nokia.maps.kml.StyleSelector that provides the initial style definition; it must contain the attribute id; if this argument is not specified, or does not contain id attribute, then this initial array is empty

Method Details

getStyleById(id, highlighted): {*nokia.maps.kml.Style*}

This method gets the concrete nokia.maps.kml.Style for the nokia.maps.kml.StyleSelector matching the id provided by the caller

Parameters:

id:	{String}
	A unique identifier for the StyleSelector
highlighted:	{Boolean} [optional]
	A Boolean value that indicates if the method is to return the style for a highlighted case (true); if the value is true and if the particular style is not a StyleMap, then the method returns null, because there is no highlighted style for the nokia.maps.kml.Style object

Returns:

{*nokia.maps.kml.Style*}

style matching the id specified by the caller

getStyles(): {*nokia.maps.kml.StyleSelector*[]}

This method gets the internal array of nokia.maps.kml.StyleSelector

www.EngineeringBooksPdf.com

Returns:

{*nokia.maps.kml.StyleSelector*[]}

An array of instances of nokia.maps.kml.StyleSelector

push(style): {Object}

This method adds new element to the internal array.

Parameters:

style: {*nokia.maps.kml.StyleSelector*}

An instance of nokia.maps.kml.StyleSelector that provides the style definition; it must contain the attribute id

Returns:

{Object} An array of instances of nokia.maps.kml.StyleSelectors

Class: StyleMap

This class is a member of ***nokia.maps.kml***.

Class Summary

This class represents the <StyleMap> element, which provides separate normal and highlighted styles for a placemark so that the highlighted version appears when the user's mouse pointer moves over an icon.

[*For full details, see nokia.maps.kml.StyleMap*]

Table 101: Method Summary

Methods
getStyle (highlighted) : {*nokia.maps.kml.Style*} This method retrieves the style for the given object.

www.EngineeringBooksPdf.com

Class Description

This class represents the <StyleMap> element, which provides separate normal and highlighted styles for a placemark so that the highlighted version appears when the user's mouse pointer moves over an icon.

Constructor Details

`nokia.maps.kml.StyleMap``(node, styleContainer)`

The constructor initializes a new instance of the class, using the arguments provided by the caller.

Parameters:

`node:`	`{Node}`
	An XML node from the KML document that is being parsed
`styleContainer:`	{*`nokia.maps.kml.StyleContainer`*}
	A container with an array of global styles on which the attribute `id` is set to be used by the given `StyleMap`

Method Details

`getStyle``(highlighted): {`*`nokia.maps.kml.Style`*`}`

This method retrieves the style for the given object.

Parameters:

`highlighted:`	`{Boolean}` [optional]
	A Boolean value that indicates if the method is to return the style for a highlighted case (`true`)

Returns:

{*`nokia.maps.kml.Style`*}

An object encapsulating the style for the given class instance

Class: StyleSelector

This class is a member of ***`nokia.maps.kml`***.

www.EngineeringBooksPdf.com

Class Summary

This class represents the abstract <StyleSelector> tag from the KML specification.

[*For full details, see nokia.maps.kml.StyleSelector*]

Class Description

This class represents the abstract <StyleSelector> tag from the KML specification.

Constructor Details

`nokia.maps.kml.StyleSelector``(node)`

The constructor initializes a new instance of the class, using the arguments provided by the caller.

Parameters:

node:	{Node}
	An XML node from the KML document that is being parsed

Class: Vector2

This class is a member of ***`nokia.maps.kml`***.

Class Summary

This class represents the <kml:vec2> data type from KML specification.

[*For full details, see nokia.maps.kml.Vector2*]

Class Description

This class represents the <kml:vec2> data type from KML specification.

Constructor Details

`nokia.maps.kml.Vector2``(node)`

Initialize a new instance of the class with the following parameters.

Parameters:

node:	{Node}

www.EngineeringBooksPdf.com

A DOM note from which to extract the attributes "x", "y", "xunits" and "yunits".

Namespace: component

This namespace is a member of ***nokia.maps.kml***.

Namespace Summary

This namespace defines the KML result set.

Namespace Description

This namespace defines the KML result set.

Class: KMLResultSet

This class is a member of ***nokia.maps.kml.component***.

Extends: *nokia.maps.util.OObject*

Class Summary

This class represents a result set that can be initiated with a response from a KML file request.

[*For full details, see nokia.maps.kml.component.KMLResultSet*]

Table 102: Property Summary

Properties
container: {*nokia.maps.map.Container*} This property is a container of markers, representing the results.
state: {String} This property holds the state of the container creation.

Table 103: Method Summary

Methods
create () : {*nokia.maps.map.Container*} This method asynchronously converts `kmlDocument` provided in the constructor to an instance of *nokia.maps.map.Container*.

www.EngineeringBooksPdf.com

Methods
getLineObject `(geometry) : {`*nokia.maps.map.Polyline*`}` This method converts an instance of `LinearRing` or `LineString` (a geometry) to a displayable map *nokia.maps.map.Polyline*.
getPointObject `(geometry) : {`*nokia.maps.map.Marker* `|` *nokia.maps.map.StandardMarker*`}` This method converts the point geometry to a displayable map object.
getPolygonObject `(geometry) : {`*nokia.maps.map.Polygon*`}` This method converts a polygon geometry to a `nokia.maps.map.Polygon` that can be displayed on the map.

Directly Inherited Methods

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This class represents a result set that can be initiated with a response from a KML file request. If there is an content for particular KML element than *nokia.maps.map.component.InfoBubbles.Bubble* is attached to visual representation of this element when user clicks on the element. This can happen only if *nokia.maps.map.component.InfoBubbles* component is added to the map:

```
var infoBubbles = new nokia.maps.map.component.InfoBubbles(); //map is an
instance of nokia.maps.map.Display map.components.add(infoBubbles);
```

Constructor Details

`nokia.maps.kml.component.KMLResultSet(kmlManager, display)`

This method initializes a new instance of the class, using the arguments supplied by the caller.

Parameters:

`kmlManager`:	`{`*nokia.maps.kml.Manager* `|` *nokia.maps.kml.Document*`}` An instance of `kml.Manager` that was used in parsing a KML file (deprecated: An instance of `kml.Document` that results from parsing a KML file)
`display`:	`{`*nokia.maps.map.Display*`}` [optional] An instance of `map.Display` so that a map object listener can be added to ensure support for highlighted styles; if this argument is not provided by the caller, highlighted styles are not supported

www.EngineeringBooksPdf.com

Example:

```
var kmlManager = new nokia.maps.kml.Manager(),
    resultSet,
    container;

kmlManager.addObserver("state", function(kmlManager) {
    if (kmlManager.state == KMLManager.State.FINISHED) {
        resultSet = new nokia.maps.kml.component.KMLResultSet(kmlManager);
        mapDisplay.objects.add(resultSet.create());
    }
}, that);
kmlManager.parseKML("sampleFile.kml");
```

Property Details

container: {*nokia.maps.map.Container*}

This property is a container of markers, representing the results.

state: {String}

This property holds the state of the container creation. The possible values are: "initial", "started", "finished".

Method Details

create(): {*nokia.maps.map.Container*}

This method asynchronously converts `kmlDocument` provided in the constructor to an instance of *nokia.maps.map.Container*.

When dealing with heavy KML files, please add the object returned by this method to the map display immediately. This method returns an empty *nokia.maps.map.Container* object and starts a *nokia.maps.util.Coroutine* which asynchronously fills it with objects held provided by the `kmlDocument` object. As a result, some of the `kmlDocument` objects may be rendered before others are added. When an entire `kmlDocument` is parsed and all the required containers and objects are created, the state of the `KMLResultSet` object is set to "finished". To receive notification of the state change, attach an observer as shown in the example below:

```
var kmlManager = new nokia.maps.kml.Manager(),
  resultSet;

kmlManager.addObserver("state", function (kmlManager) {
  // KML file was successfully loaded
  if (kmlManager.state == "finished") {
```

www.EngineeringBooksPdf.com

```
  // KML file was successfully parsed
  resultSet = new
nokia.maps.kml.component.KMLResultSet(kmlManager.kmlDocument, map);
  resultSet.addObserver("state", function (resultSet) {
   if (resultSet.state == "finished") {
    // KML object tree was successfully converted into map objects
    // Get the bounding box of container
    boundingBox = resultSet.container.getBoundingBox();
    // Switch the viewport of the map do show all KML map objects within
the container
    if (boundingBox) {
     map.zoomTo(boundingBox);
    }
   }
  });
  map.objects.add(resultSet.create());
 }
});
kmlManager.parseKML("sampleFile.kml");
```

The method uses a modified *Breadth-first search algorithm* to traverse the tree.

Returns:

{*nokia.maps.map.Container*}

Returns map container which will hold map equivalents of KML objects

getLineObject(geometry): {*nokia.maps.map.Polyline*}

This method converts an instance of `LinearRing` or `LineString` (a geometry) to a displayable map *nokia.maps.map.Polyline*.

Parameters:

geometry: {*nokia.maps.kml.Point*}

A KML line object or *nokia.maps.kml.LineString* object

Returns:

{*nokia.maps.map.Polyline*}

A displayable map object that can be added directly to an instance of *nokia.maps.map.Display*

www.EngineeringBooksPdf.com

getPointObject(geometry): {*nokia.maps.map.Marker* | *nokia.maps.map.StandardMarker*}

This method converts the point geometry to a displayable map object. Depending on the style properties, the resulting object can be an instance of *nokia.maps.map.Marker* or *nokia.maps.map.StandardMarker*

Parameters:

geometry: {*nokia.maps.kml.Point*}

A KML point object

Returns:

{*nokia.maps.map.Marker* | *nokia.maps.map.StandardMarker*}

An object that can be displayed on the map by adding it to an instance of *nokia.maps.map.Display*

getPolygonObject(geometry): {*nokia.maps.map.Polygon*}

This method converts a polygon geometry to a nokia.maps.map.Polygon that can be displayed on the map.

Parameters:

geometry: {*nokia.maps.kml.Polygon*}

A KML polygon object

Returns:

{*nokia.maps.map.Polygon*}

A displayable polygon that can be added directly to an instance of *nokia.maps.map.Display*

Namespace: map

This namespace is a member of ***nokia.maps***.

www.EngineeringBooksPdf.com

Namespace Summary

This namespace defines classes that display the map and support management of map objects such as markers, geometric shapes, etc.

Namespace Description

This namespace defines classes that display the map and support management of map objects such as markers, geometric shapes, etc.

Class: Circle

This class is a member of ***nokia.maps.map***.

Class Summary

This class defines a map object with a circular shape.

[*For full details, see nokia.maps.map.Circle*]

Table 104: Property Summary

Properties
center: {*nokia.maps.geo.Coordinate*} An object holding the coordinates of the center of the circle.
precision: {Number} This property holds the precision of the circle as a number of segments to be used when drawing the circle.
radius: {Number} The radius of the circle in meters.

Directly Inherited Properties

Inherited from class *nokia.maps.map.Polygon* :

brush

Inherited from class *nokia.maps.map.Polyline* :

arrows, *path*, *pen*

Inherited from class *nokia.maps.map.Spatial* :

simplify

www.EngineeringBooksPdf.com

Inherited from class *nokia.maps.map.Object* :

CHANGE_SPATIAL, *CHANGE_VISUAL*, *CHANGE_ZINDEX*, *visibility*, *zIndex*

Inherited from class *nokia.maps.dom.EventTarget* :

isDraggable, *isEventTarget*, *parentNode*, *parentNodes*

Inherited from class *nokia.maps.map.provider.IData* :

id

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.Polyline* :

getNearest, *getNearestIndex*

Inherited from class *nokia.maps.map.Object* :

destroy, *getBoundingBox*, *getDisplay*, *getParent*, *getProvider*, *getRoot*, *isVisible*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Inherited from class *nokia.maps.dom.EventTarget* :

addListener, *addListenerNS*, *addListeners*, *disableDrag*, *disableUserSelect*, *dispatch*, *enableDrag*, *enableUserSelect*, *hitTest*, *insertListener*, *insertListenerNS*, *removeAllListeners*, *removeListener*, *removeListenerNS*

Inherited from class *nokia.maps.map.provider.IData* :

getInvalidations

Event Summary

Directly Inherited Events

Inherited from class *nokia.maps.dom.MouseEventTarget* :

click, *dblclick*, *longpress*, *mousedown*, *mouseenter*, *mouseleave*, *mousemove*, *mouseout*, *mouseover*, *mouseup*, *mousewheel*

Inherited from class *nokia.maps.dom.DragEventTarget* :

drag, *dragend*, *dragenter*, *dragleave*, *dragover*, *dragstart*, *drop*

Inherited from class *nokia.maps.dom.TouchEventTarget* :

www.EngineeringBooksPdf.com

dbltap, *gesturechange*, *gestureend*, *gesturestart*, *longpress*, *tap*, *touchend*, *touchmove*, *touchstart*

Class Description

This class defines a map object with a circular shape.

Constructor Details

`nokia.maps.map.Circle``(center, radius, props)`

This method initializes an instance of `nokia.maps.map.Circle`.

Parameters:

`center`:	{*`nokia.maps.geo.Coordinate`*} An object providing the geographical coordinates of the center of the circle
`radius`:	{`Number`} A value that provides the length of the radius of the circle in meters
`props`:	{*`nokia.maps.map.Circle.Properties`*} An object that specifies object properties and their initial values (among these, `precision` has a significant impact on the shape of the circle - please see *`nokia.maps.map.Circle.Properties`*

Property Details

`center``: {`*`nokia.maps.geo.Coordinate`*`}`

An object holding the coordinates of the center of the circle.

`precision``: {Number}`

This property holds the precision of the circle as a number of segments to be used when drawing the circle. The value must be in the range between [4 ... 360], where 60 is the default. Note that the lower the value the more angular and the less circle-like the shape appears and, conversely, the higher the value the smoother and more rounded the result. Thus, starting at the extreme low end of the possible values, 4 produces a square, 6 a hexagon, while 30 results in a circle-like shape, although it appears increasingly angular as the zoom level increases (as you zoom in), and finally 360 produces a smooth circle.

www.EngineeringBooksPdf.com

Default Value: 60

radius: {Number}

The radius of the circle in meters. Negative values are not allowed.

Interface: Properties

This interface is a member of ***nokia.maps.map.Circle***.

Interface Summary

This interface defines the properties (keys) that can be passed to the constructor of *nokia.maps.map.Circle*.

[*For full details, see nokia.maps.map.Circle.Properties*]

Table 105: Property Summary

Properties
precision: {Number} This property provides the value for *nokia.maps.map.Circle#precision*.

Directly Inherited Properties

Inherited from class *nokia.maps.map.Polygon.Properties* :

brush

Inherited from class *nokia.maps.map.Polyline.Properties* :

arrows, *pen*

Inherited from class *nokia.maps.map.Spatial.Properties* :

simplify

Inherited from class *nokia.maps.map.Object.Properties* :

visibility, *zIndex*

Interface Description

This interface defines the properties (keys) that can be passed to the constructor of *nokia.maps.map.Circle*.

www.EngineeringBooksPdf.com

Property Details

precision: {Number}

This property provides the value for *nokia.maps.map.Circle#precision*.

Class: Container

This class is a member of ***nokia.maps.map***.

Extends: *nokia.maps.map.Object*

Class Summary

This class defines a container for objects that can be displayed on the map.

[*For full details, see nokia.maps.map.Container*]

Table 106: Property Summary

Properties
objects: {*nokia.maps.util.OList*} This property holds the objects that have been added to the given container.

Directly Inherited Properties

Inherited from class *nokia.maps.map.Object* :

CHANGE_SPATIAL, *CHANGE_VISUAL*, *CHANGE_ZINDEX*, *visibility*, *zIndex*

Inherited from class *nokia.maps.dom.EventTarget* :

isDraggable, *isEventTarget*, *parentNode*, *parentNodes*

Inherited from class *nokia.maps.map.provider.IData* :

id

Table 107: Method Summary

Methods
contains (object) : {Boolean} This method checks if the container contains the map object provided by the caller.
getBoundingBox () : {*nokia.maps.geo.BoundingBox*} This method calculates the outer bounding box of the given container.

www.EngineeringBooksPdf.com

Directly Inherited Methods

Inherited from class *nokia.maps.map.Object* :

destroy, *getBoundingBox*, *getDisplay*, *getParent*, *getProvider*, *getRoot*, *isVisible*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Inherited from class *nokia.maps.dom.EventTarget* :

addListener, *addListenerNS*, *addListeners*, *disableDrag*, *disableUserSelect*, *dispatch*, *enableDrag*, *enableUserSelect*, *hitTest*, *insertListener*, *insertListenerNS*, *removeAllListeners*, *removeListener*, *removeListenerNS*

Inherited from class *nokia.maps.map.provider.IData* :

getInvalidations

Event Summary

Directly Inherited Events

Inherited from class *nokia.maps.dom.MouseEventTarget* :

click, *dblclick*, *longpress*, *mousedown*, *mouseenter*, *mouseleave*, *mousemove*, *mouseout*, *mouseover*, *mouseup*, *mousewheel*

Inherited from class *nokia.maps.dom.DragEventTarget* :

drag, *dragend*, *dragenter*, *dragleave*, *dragover*, *dragstart*, *drop*

Inherited from class *nokia.maps.dom.TouchEventTarget* :

dbltap, *gesturechange*, *gestureend*, *gesturestart*, *longpress*, *tap*, *touchend*, *touchmove*, *touchstart*

Class Description

The class `Container` groups objects (instances of *`nokia.maps.map.Object`*), allowing operations to be performed on them as a unit. For example, you can set the visibility of the container and thus show or hide all the objects it includes, without having to change the visibility of each object individually. An instance of `Container` can include other containers as well as objects such as markers, polylines, polygones, etc.

Constructor Details

`nokia.maps.map.Container``(props)`

www.EngineeringBooksPdf.com

This method creates an instance of `Container`. The caller provides the object to be added to the container, as well as container initialization properties.

Parameters:

`props`:	{*nokia.maps.map.Container.Properties*} The initialization properties for the container

Property Details

`objects`: {*nokia.maps.util.OList*}

This property holds the objects that have been added to the given container. The property can be managed, using methods defined on `nokia.maps.util.Olist`.

Method Details

`contains``(object)`: {`Boolean`}

This method checks if the container contains the map object provided by the caller.

Parameters:

`object`:	{*nokia.maps.map.Object*} An object whose presence in the given instance of Container is to be verified.
Since:	2.5

Returns:

{`Boolean`}	`true` if the container contains the object or they are identical, otherwise `false`.

`getBoundingBox``()`: {*nokia.maps.geo.BoundingBox*}

This method calculates the outer bounding box of the given container. This means a bounding box encompassing all the map objects in the container, including all child containers. If the container does not contain any objects or child containers, the method returns `null`. If the container contains only one object that has no geographical dimensions, for example an instance of *nokia.maps.map.Marker* or *nokia.maps.map.StandardMarker*, then the returned bounding box may have the size of zero.

www.EngineeringBooksPdf.com

Returns:

{*nokia.maps.geo.BoundingBox*}

The calculated geographic outer bounding box of the given container or `null`, if the container has no geographic dimensions.

Interface: Properties

This interface is a member of ***nokia.maps.map.Container***.

Interface Summary

This interface defines the properties (keys) that can be passed to the constructor of *nokia.maps.map.Container*.

[*For full details, see nokia.maps.map.Container.Properties*]

Table 108: Property Summary

Properties
objects: {*nokia.maps.util.OList*} This property holds the initial set of map objects that have been added to the container.

Directly Inherited Properties

Inherited from class *nokia.maps.map.Object.Properties* :

visibility, *zIndex*

Interface Description

This interface defines the properties (keys) that can be passed to the constructor of *nokia.maps.map.Container*.

Property Details

objects: {*nokia.maps.util.OList*}

This property holds the initial set of map objects that have been added to the container. The property can be managed, using methods defined on `nokia.maps.util.Olist`.

www.EngineeringBooksPdf.com

Class: Display

This class is a member of ***nokia.maps.map***.

Extends: *nokia.maps.map.Container*

Class Summary

This class displays a map and map objects such as markers, polylines, polygons, etc.

[*For full details, see nokia.maps.map.Display*]

Table 109: Property Summary

Properties
animation: {*nokia.maps.util.OList*} This property specifies the currently supported map animation types.
availableBaseMapTypes: {*nokia.maps.util.OList*} This property holds a list of all available *nokia.maps.map.provider.Provider*s for base map types.
availableOverlays: {*nokia.maps.util.OList*} This property holds a list of all available *nokia.maps.map.provider.Provider*s for map overlays.
baseMapType: {*nokia.maps.map.provider.Provider*} This property holds the current base map type to be used for display (such as satellite, terrain, hybrid).
bounceEnabled: {Boolean} This property keeps a flag to signal if the bouncing effect is activated or not
center: {*nokia.maps.geo.Coordinate*} This property contains the coordinates of the map center.
components: {*nokia.maps.util.OList*} This property holds a list of all components that have been added to the map (to the given instance of `nokia.maps.map.Display`).
copyrightAlignment: {String} This property specifies the position of the copyright information relative to the display.
readonly ***copyrightHeight***: {Number} This property holds the height in pixels of the frame containing the text "Copyright by .
readonly ***copyrightPosition***: {*nokia.maps.util.IPoint*}

www.EngineeringBooksPdf.com

Properties

This property holds the position of the frame containing the label "Copyright by ".

`readonly` ***copyrightWidth***: {Number}

This property holds the width in pixels of the frame containing the text "Copyright by .

default2dRenderMode: {String}

This property holds the type of the render mode for 2d map.

fixedCenter: {Boolean}

This property is a flag indicating if the center of the map should remain unchanged if the display is resized or padding changes.

heading: {Number}

This property holds the heading (bearing) of the map in degrees.

`readonly` ***height***: {Number}

This property holds the height of the map area in pixels.

`static` ***InteractionModifiers***:

This variable defines a set of bitmask values that can be passed to the method *nokia.maps.map.Display.beginInteraction*.

margin: {Number}

This property holds the size of the supplemental rendering area.

maxHeading: {Number}

This property holds the maximum supported map heading (bearing).

maxTilt: {Number}

This property holds the maximum supported map tilt.

maxZoomLevel: {Number}

This property holds the maximum zoom level supported by the map (considering the current heading/tilting).

minHeading: {Number}

This property holds the minimum supported map heading (bearing).

minTilt: {Number}

This property holds the minimum supported map tilt.

minZoomLevel: {Number}

This property holds the minimum zoom level supported by the map (considering the current heading/tilting).

`static` ***NORMAL***: {*nokia.maps.map.provider.TileProvider*}

This type indicates a normal street map.

www.EngineeringBooksPdf.com

Properties
static ***NORMAL_COMMUNITY***: {*nokia.maps.map.provider.TileProvider*}
This type indicates a normal street map with community edits.
onError:
Function that is invoked when error condition occurs during baseMapType switching (for example no StreetLevel coverage exists for the given coordinate).
overlays: {*nokia.maps.util.OList*}
This property holds the list of all map overlays which are currently active for the map.
padding: {*nokia.maps.util.IBox*}
This property defines the padding in pixels for each side of the map display, thus setting a virtual viewport.
readonly ***poweredByHeight***: {Number}
This property holds the height in pixels of the frame containing the logo "Powered by .
readonly ***poweredByPosition***: {*nokia.maps.util.IPoint*}
This property holds the position of the frame containing the label "Powered by ".
readonly ***poweredByWidth***: {Number}
This property holds the width in pixels of the frame containing the logo "Powered by .
static ***SATELLITE***: {*nokia.maps.map.provider.TileProvider*}
This type indicates a hybrid satellite map with street information on top.
static ***SATELLITE_COMMUNITY***: {*nokia.maps.map.provider.TileProvider*}
This type indicates a hybrid satellite map with street information and community edits on top.
static ***SATELLITE_PLAIN***: {*nokia.maps.map.provider.TileProvider*}
This type indicates a satellite map.
static ***SMART_PT***: {*nokia.maps.map.provider.TileProvider*}
This type indicates a public transport map.
static ***SMARTMAP***: {*nokia.maps.map.provider.TileProvider*}
This type indicates a smart map.
static ***TERRAIN***: {*nokia.maps.map.provider.TileProvider*}
This type indicates a topographical map, where shading and color convey the shape of the terrain.
tilt: {Number}
This property holds the value of the map tilt in degrees.
static ***TRAFFIC***: {*nokia.maps.map.provider.TileProvider*}

www.EngineeringBooksPdf.com

Properties
This type indicates a traffic info map.
`readonly` ***`width`***`: {Number}` This property holds the width of the map area in pixels.
`zoomLevel``: {Number}` This property holds the zoom level of the current view.

Directly Inherited Properties

Inherited from class *nokia.maps.map.Container* :

objects

Inherited from class *nokia.maps.map.Object* :

CHANGE_SPATIAL, *CHANGE_VISUAL*, *CHANGE_ZINDEX*, *visibility*, *zIndex*

Inherited from class *nokia.maps.dom.EventTarget* :

isDraggable, *isEventTarget*, *parentNode*, *parentNodes*

Inherited from class *nokia.maps.map.provider.IData* :

id

Table 110: Method Summary

Methods
`addComponent` `(component) : {`*`nokia.maps.map.component.Component`*`}` This method adds a new component to the given `Display` instance.
`static` ***`beginControl`*** `(mode, kinetics, x, y)` This method signals the begin of a control operation.
`static` ***`beginInteraction`*** `(modifiers, kinetics, timeStamp, x, y, biX, biY)` This method signals the beginning of an interaction.
`blur` `()` Removes keyboard focus from the display.
`bounce` `(direction, atX, atY)` Method is responsible for map bouncing effect if one is supported with the current baseMapType.
`static` ***`control`*** `(timeStamp, moveX, moveY, moveZ, angleX, angleY, angleZ, zoom)` This method process a control operation.

www.EngineeringBooksPdf.com

Methods
destroy `()` This method destroys the map `Display` instance and frees the resources.
`static` ***endControl*** `(adjust)` This method signals the end of a control operation.
`static` ***endInteraction*** `()` This method signals the end of an interaction.
focus `()` Gives keyboard focus to the display.
geoToPixel `(coord) : {`*nokia.maps.util.Point*`}` This method translates the received point object containing WGS84 coordinates into pixel coordinates relative to the top left corner of the map view.
getBestZoomLevel `(bBoxes) : {Number}` This method computes the minimum zoom level at which each of the given bounding boxes fit into the display area.
getBoundingBox `() : {`*nokia.maps.geo.BoundingBox*`}` This method calculates the outer bounding box of all map objects in the given `Display` instance, including all child containers.
getCam `() : {`*nokia.maps.map.ICam*`}` This method returns the map camera
getComponentById `(id) : {`*nokia.maps.map.component.Component*`}` This method returns the first component with the given identifier or `null` if no component with such an identifier is currently attached to the `Display` instance.
getObjectAt `(x, y) : {`*nokia.maps.map.Object* `| undefined}` A method to obtain the topmost visible object at the given position relative to the viewport's origin.
getObjectsAt `(x, y) : {`*nokia.maps.map.Object*`[]}` A method to obtain all objects that are visible at the given pixel position relative to the viewport's origin.
getObjectsWithin `(left, top, right, bottom) : {`*nokia.maps.map.Object*`[]}` This method returns all objects found within a rectangle defined in terms of the pixel coordinates of its top left and bottom right corners.
getView `() : {`*nokia.maps.map.IView*`}` This method returns the map view
getViewBounds `() : {`*nokia.maps.geo.BoundingBox*`}`

www.EngineeringBooksPdf.com

Methods
This method retrieves the outer bounding box of the map view (the smallest bounding box covering all visible points).
getZoom (x, y) : {Number} This methode returns zoom level at provided screen position.
static ***interact*** (timeStamp, x, y, biX, biY) This method processes an interaction based on the screen coordinates of the viewport.
pan (startX, startY, endX, endY, animation) This mehtod pans the map from the start point to the end point specified by the caller.
pixelToGeo (x, y) : {*nokia.maps.geo.Coordinate*} This method translates a pixel position within the viewport to geo coordinates.
removeComponent (component) : {Number} This method decrements the reference counter of the supplied component and if the counter has reached zero, the method removes the component from display.
setAttributes (animation, center, level, tilt, heading) This method sets a number of properties of the map.
setBaseMapType (provider, animate, view) This method sets base map type provider and optional transition between old and new provider can be involved.
setCam (cam, animation) : {*nokia.maps.map.ICam*} This method sets the new camera for the map.
setCenter (coord, animation) This method centers the map on the location specified by the caller.
setCopyrightAlignment (alignment) This method sets the position of the copyright information.
setHeading (heading, animation) This method sets the heading (bearing) of the map.
setPadding (padding1, padding2, padding3, padding4) This method sets the property *nokia.maps.map.Display#padding*.
setTilt (tilt, animation) This method sets the tilt of the map.
setView (view, animation) : {*nokia.maps.map.IView*} This method sets the new view for the map.

www.EngineeringBooksPdf.com

Methods
setZoomLevel `(level, animation, toX, toY)` This method sets the zoom level to the value specified by the caller.
update `(delay, quick) : {`*nokia.maps.map.Display*`}` This method causes the current map view to be re-rendered.
zoomTo `(boundingBox, keepCenter, animation)` This method zooms the map to ensure that the bounding box provided by the caller is visible in its entirety in the map viewport.

Directly Inherited Methods

Inherited from class *nokia.maps.map.Container* :

contains, *getBoundingBox*

Inherited from class *nokia.maps.map.Object* :

destroy, *getBoundingBox*, *getDisplay*, *getParent*, *getProvider*, *getRoot*, *isVisible*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Inherited from class *nokia.maps.dom.EventTarget* :

addListener, *addListenerNS*, *addListeners*, *disableDrag*, *disableUserSelect*, *dispatch*, *enableDrag*, *enableUserSelect*, *hitTest*, *insertListener*, *insertListenerNS*, *removeAllListeners*, *removeListener*, *removeListenerNS*

Inherited from class *nokia.maps.map.provider.IData* :

getInvalidations

Table 111: Event Summary

Events
basemapchangeend This event is fired to mark the end of a change from one base map type to another (for example `NORMAL` to `SATELLITE`).
basemapchangestart This event is fired to mark the start of a change from one base map type to another (for example `NORMAL` to `SATELLITE`).
displayready This event is fired when the map ha been initialized and is ready to support interactive events, transitions and animations.

www.EngineeringBooksPdf.com

Events
mapvalueexceeded
This event is fired if a received value exceeds the permitted range.
mapviewchange
This event is fired each time after the map has been rendered in response to a `mapviewchange` event (see *nokia.maps.map.Display.MapViewChangeEvent*).
mapviewchangeend
This event is fired when the map display has been rendered and all map view changes have been processed (see also *nokia.maps.map.Display.MapViewChangeEvent*).
mapviewchangestart
This event is fired immediately after the map view has been changed (see *nokia.maps.map.Display.MapViewChangeEvent*).
resize
This event is fired each time a change of the size of the display is detected.
resizeend
This event is fired when a resizing operation has finished (when no more changes to the size of the display have been detected for a certain amount of time).
resizestart
This event is fired immediately after the process of resizing the display has begun and then periodically until the process has completed, when `resizeend` is fired.
transitionend
This event is fired immediately after a map animation has finished or a transition from one base map type to another (in the latter case the event precedes nokia.maps.map.Display#basemapchangeend).
transitionstart
This event is fired immediately after a map animation starts or a transition from one base map type to another (in the latter case the event follows nokia.maps.map.Display#basemapchangestart).

Directly Inherited Events

Inherited from class *nokia.maps.dom.MouseEventTarget* :

click, *dblclick*, *longpress*, *mousedown*, *mouseenter*, *mouseleave*, *mousemove*, *mouseout*, *mouseover*, *mouseup*, *mousewheel*

Inherited from class *nokia.maps.dom.DragEventTarget* :

drag, *dragend*, *dragenter*, *dragleave*, *dragover*, *dragstart*, *drop*

Inherited from class *nokia.maps.dom.TouchEventTarget* :

www.EngineeringBooksPdf.com

dbltap, *gesturechange*, *gestureend*, *gesturestart*, *longpress*, *tap*, *touchend*, *touchmove*, *touchstart*

Class Description

This class displays a map, allowing multiple optional layers (containers) and objects such as markers, polylines, polygons, cirles, etc., to be added to it.

Constructor Details

`nokia.maps.map.Display``(container, props)`

This method displays a map, allowing multiple containers and objects to be added to it.

Parameters:

`container:`	`{HTMLElement}`
	The DOM node where the map should be displayed
`props:`	{*`nokia.maps.map.Display.Properties`*} [optional]
	An object containing initialization properties

Property Details

`animation`: {*`nokia.maps.util.OList`*}

This property specifies the currently supported map animation types.

Animations depend on the platform and the rendering engine used, therefore this property must be checked at run-time to see if a specific animation is supported by the current rendering engine on the current platform.

In all cases, the following values for this property are supported:

- "none" - no animation
- "default" - default animation

Note 1: The default animation may be set to "none", which means that the rendering engine on the current platform does not support animation.

Note 2: If you specify an incorrect animation name, the animation type automatically reverts to "default".

`availableBaseMapTypes`: {*`nokia.maps.util.OList`*}

www.EngineeringBooksPdf.com

This property holds a list of all available *nokia.maps.map.provider.Provider*s for base map types.

availableOverlays: {*nokia.maps.util.OList*}

This property holds a list of all available *nokia.maps.map.provider.Provider*s for map overlays.

baseMapType: {*nokia.maps.map.provider.Provider*}

This property holds the current base map type to be used for display (such as satellite, terrain, hybrid). The given type must be one of the supported types. See *nokia.maps.map.Display#availableBaseMapTypes*

bounceEnabled: {Boolean}

This property keeps a flag to signal if the bouncing effect is activated or not

Default Value: `true`

center: {*nokia.maps.geo.Coordinate*}

This property contains the coordinates of the map center.

components: {*nokia.maps.util.OList*}

This property holds a list of all components that have been added to the map (to the given instance of `nokia.maps.map.Display`).

copyrightAlignment: {String}

This property specifies the position of the copyright information relative to the display. The allowed values are:

- topleft
- topcenter
- topright
- middleleft
- middlecenter

www.EngineeringBooksPdf.com

- middleright
- bottomleft
- bottomcenter
- bottomright

Default Value: `"bottomleft"`

`readonly` **`copyrightHeight`**`: {Number}`

This property holds the height in pixels of the frame containing the text "Copyright by ...".

`readonly` **`copyrightPosition`**`: {`*`nokia.maps.util.IPoint`*`}`

This property holds the position of the frame containing the label "Copyright by ".

`readonly` **`copyrightWidth`**`: {Number}`

This property holds the width in pixels of the frame containing the text "Copyright by ...".

`default2dRenderMode``: {String}`

This property holds the type of the render mode for 2d map. Possible values are:

- "dom"
- "canvas"

If set to "canvas" but environment doesn't support "canvas" element "dom" rendering will be used

`fixedCenter``: {Boolean}`

This property is a flag indicating if the center of the map should remain unchanged if the display is resized or padding changes.

Default Value: `true`

`heading``: {Number}`

www.EngineeringBooksPdf.com

This property holds the heading (bearing) of the map in degrees. The property depends on the platform used and is only available if `maxHeading` is greater than 0.

`readonly` **`height`**`: {Number}`

This property holds the height of the map area in pixels.

`static` **`InteractionModifiers`**`:`

This variable defines a set of bitmask values that can be passed to the method *nokia.maps.map.Display.beginInteraction*.

`margin``: {Number}`

This property holds the size of the supplemental rendering area. The renderer must be prepared to allow rapid mouse panning within the displayed area extended on each side by the given margin (in pixels).

Default Value: 64

`maxHeading``: {Number}`

This property holds the maximum supported map heading (bearing). You can obtain the maximum supported heading by invoking the method `get()` on an instance of `Display`, with the name of this property as the only argument. For example, if "myMap" is an instance of `map.Display`, then the code `myMap.get("maxHeading")` obtains the current value of `maxHeading`.

`maxTilt``: {Number}`

This property holds the maximum supported map tilt. You can obtain the maximum supported tilt by invoking the method `get()` on an instance of `Display`, with the name of this property as the only argument. For example, if "myMap" is an instance of `map.Display`, then the code `myMap.get("maxTilt")` obtains the current value of `maxTilt`.

`maxZoomLevel``: {Number}`

www.EngineeringBooksPdf.com

This property holds the maximum zoom level supported by the map (considering the current heading/tilting). You can obtain the maximum supported zoom level by invoking the method `get()` on an instance of `Display`, with the name of this property as the only argument. For example, if "myMap" is an instance of `map.Display`, then the code `myMap.get("maxZoomLevel")` obtains the current value of `maxZoomLevel`.

`minHeading`: {Number}

This property holds the minimum supported map heading (bearing). You can obtain the minimum supported heading by invoking the method `get()` on an instance of `Display`, with the name of this property as the only argument. For example, if "myMap" is an instance of `map.Display`, then the code `myMap.get("minHeading")` obtains the current value of `minHeading`.

`minTilt`: {Number}

This property holds the minimum supported map tilt. You can obtain the minimum supported tilt by invoking the method `get()` on an instance of `Display`, with the name of this property as the only argument. For example, if "myMap" is an instance of `map.Display`, then the code `myMap.get("minTilt")` obtains the current value of `minTilt`.

`minZoomLevel`: {Number}

This property holds the minimum zoom level supported by the map (considering the current heading/tilting). You can obtain the minimum supported zoom level by invoking the method `get()` on an instance of `Display`, with the name of this property as the only argument. For example, if "myMap" is an instance of `map.Display`, then the code `myMap.get("minZoomLevel")` obtains the current value of `minZoomLevel`.

static **`NORMAL`**: {*nokia.maps.map.provider.TileProvider*}

This type indicates a normal street map.

static **`NORMAL_COMMUNITY`**: {*nokia.maps.map.provider.TileProvider*}

This type indicates a normal street map with community edits.

www.EngineeringBooksPdf.com

onError:

Function that is invoked when error condition occurs during baseMapType switching (for example no StreetLevel coverage exists for the given coordinate). By default does nothing.

overlays: {*nokia.maps.util.OList*}

This property holds the list of all map overlays which are currently active for the map.

padding: {*nokia.maps.util.IBox*}

This property defines the padding in pixels for each side of the map display, thus setting a virtual viewport. The virtual viewport does not affect the placing or the size of the visible map in the DOM node, but defines an area which excludes strips along the edges of the map that contain the UI elements zoom bar, copyright and map-type selector (if these elements are displayed). The virtual viewport is taken into consideration when setting the map center, when obtaining the map view bounds and when zooming to a bounding box. Its other purpose is to help prevent objects from overlapping very close to the edges of the visible map.

The map viewport determined by padding is taken into account when setting the map center, which is the center of the virtual viewport, not of the visible map. Furthermore, the viewport is used by the following methods:

- *nokia.maps.map.Display#setCenter* - the map is centered in the virtual viewport, not in the visible area of the map
- *nokia.maps.map.Display#getViewBounds* - the method calculates and returns the bounding box of the virtual view port
- *nokia.maps.map.Display#zoomTo* - the method sets the zoom level to ensure that the entire bounding box passed to it is visible in the virtual viewport

`padding` cannot be changed directly. Please use the methods *nokia.maps.map.Display#setPadding* or the inherited *nokia.maps.util.OObject#set* instead. For example, you can call the method `set()` as follows:

```
set("padding", aPadding);
```

readonly **poweredByHeight**: {Number}

This property holds the height in pixels of the frame containing the logo "Powered by ...".

www.EngineeringBooksPdf.com

`readonly` **`poweredByPosition`**: {*`nokia.maps.util.IPoint`*}

This property holds the position of the frame containing the label "Powered by ".

`readonly` **`poweredByWidth`**: {`Number`}

This property holds the width in pixels of the frame containing the logo "Powered by ...".

`static` **`SATELLITE`**: {*`nokia.maps.map.provider.TileProvider`*}

This type indicates a hybrid satellite map with street information on top.

`static` **`SATELLITE_COMMUNITY`**: {*`nokia.maps.map.provider.TileProvider`*}

This type indicates a hybrid satellite map with street information and community edits on top.

`static` **`SATELLITE_PLAIN`**: {*`nokia.maps.map.provider.TileProvider`*}

This type indicates a satellite map.

`static` **`SMART_PT`**: {*`nokia.maps.map.provider.TileProvider`*}

This type indicates a public transport map. It is uses the smart map color scheme with additional public transport route lines on top. Availability of public transport information may vary.

`static` **`SMARTMAP`**: {*`nokia.maps.map.provider.TileProvider`*}

This type indicates a smart map. It is similar to normal street map, but uses an optimized color set ready to show additional overlay information.

`static` **`TERRAIN`**: {*`nokia.maps.map.provider.TileProvider`*}

This type indicates a topographical map, where shading and color convey the shape of the terrain.

`tilt`: {`Number`}

www.EngineeringBooksPdf.com

This property holds the value of the map tilt in degrees. The property is platform dependent and is available only if `maxTilt` is greater than 0.

`static` **`TRAFFIC`**`: {`*`nokia.maps.map.provider.TileProvider`*`}`

This type indicates a traffic info map. Since version 2.5.3 it can be used as a base map. Availability of traffic information may vary.

`readonly` **`width`**`: {Number}`

This property holds the width of the map area in pixels.

`zoomLevel``: {Number}`

This property holds the zoom level of the current view.

Method Details

`addComponent``(component): {`*`nokia.maps.map.component.Component`*`}`

This method adds a new component to the given `Display` instance. If a component with the same id already exists (has been added previously), the method returns that component after incrementing its reference counter (the method does not create/add multiple instances of the same component).

Parameters:

`component:` `{`*`nokia.maps.map.component.Component`*`}`

A reference to the component to be added

Returns:

`{`*`nokia.maps.map.component.Component`*`}`

A reference to the newly added component or to the existing component with the same identifier

Example:

```
var component = display.addComponent(new
nokia.maps.map.component.zoom.DoubleClick());
```

www.EngineeringBooksPdf.com

`static` **`beginControl`**`(mode, kinetics, x, y)`

This method signals the begin of a control operation. Any control operation currently in progress is stopped without a kinetic effect. A current control operation is also stopped if any of the methods `setView()`, `setCam()` or `beginInteraction()` are called.

Parameters:

`mode`: `{String}`

A constant which must be either (`"cam"`) or the view (`"view"`) to indicate if the camera of view is to be controlled.

`kinetics`: `{nokia.maps.map.IKinetics}`

A value indicating the kinetic effect to use when the control ends. If `null`, no kinetic effect occurs.

x: `{Number}` [optional]

The X coordinate of the screen location, where a view control operation is applied; if `NaN` the screen center is used.

y: `{Number}` [optional]

The Y coordinate of the screen location, where a view control operation is applied; if `NaN` the screen center is taken instead.

`static` **`beginInteraction`**`(modifiers, kinetics, timeStamp, x, y, biX, biY)`

This method signals the beginning of an interaction. Any interaction already in progress is stopped, without a kinetic effect. A current interaction is also stopped if `setView()`, `setCam()` or `beginControl()` are called.

Parameters:

`modifiers`: `{Number}`

A bit mask of all enabled modification types of the map view (See *nokia.maps.map.Display.InteractionModifiers*). Apart from the `COORD` modifier, all other modifiers are evaluated in descending order of their numeric values. Only the first two which are set are taken into consideration.

www.EngineeringBooksPdf.com

kinetics:	{nokia.maps.map.IKinetics}
	A value specifying the kinetics to use when the interaction ends. If the argument is null, no kinetic effect is executed.
timeStamp:	{Number}
	The time stamp of interaction, needed for the computation of the kinetic effect.
x:	{Number}
	The starting X coordinate of the interaction.
y:	{Number}
	The starting Y coordinate of the interaction.
biX:	{Number} [optional]
	The second starting X coordinate of the interaction, only needed for bifocal interaction.
biY:	{Number} [optional]
	The second starting Y coordinate of the interaction, only needed for bifocal interaction.

blur()

Removes keyboard focus from the display.

Since: 2.5

bounce(direction, atX, atY)

Method is responsible for map bouncing effect if one is supported with the current baseMapType.

Parameters:

direction:	{Boolean} [optional]
	if value is true map bounces in opposite direction

www.EngineeringBooksPdf.com

atX: {Number} [optional]

screen X coordinate at which bounce effect takes place (defaults to screen center)

atY: {Number} [optional]

screen Y coordinate at which bounce effect takes place (defaults to screen center)

static control(timeStamp, moveX, moveY, moveZ, angleX, angleY, angleZ, zoom)

This method process a control operation. If no control operation is currently in progress (beginControl() has not been called or an endControl() has been called), the call to this method is ignored.

The x/y/z axes for movement and rotation are dependent on the control mode:

- In "cam" mode, the axes are relative to the current orientation of the cam.
- In "view" mode, the axes are relative to the current heading of the view.

Parameters:

timeStamp: {Number}

A timestamp value indicating when control call occurred, needed for computation of the kinetic effect.

moveX: {Number} [optional, default: 0]

A value indicating the move of the cam or view along the screen x axis as levels per millisecond.

moveY: {Number} [optional, default: 0]

A value indicating the move of the cam or view along the screen x axis as levels per millisecond.

moveZ: {Number} [optional, default: 0]

A value indicating the move of the cam or view along the screen z axis as levels per millisecond.

www.EngineeringBooksPdf.com

`angleX`: `{Number}` [optional, default: 0]

A value indicating the rotation of the cam or view about the screen x axis as degrees per millisecond.

`angleY`: `{Number}` [optional, default: 0]

A value indicating the rotation of the cam or view about the screen x axis as degrees per millisecond.

`angleZ`: `{Number}` [optional, default: 0]

A value indicating the rotation of the cam or view about the screen x axis as degrees per millisecond.

`zoom`: `{Number}` [optional, default: 0]

A value indicating the zoom of the view as zoom levels per millisecond; ignored in `"cam"` mode.

`destroy()`

This method destroys the map `Display` instance and frees the resources. The method may take up to a minute to complete, but afterwards, all of `Display`'s properties are set to `null` and its methods are bound to an empty function.

`static endControl(adjust)`

This method signals the end of a control operation. If `beginControl()` has received the `kinetics` argument, the kinetic effect is performed. If no control operation is currently in progress (`beginControl()` has not been called or `endControl()` has been invoked), the call to `endControl()` is ignored.

Parameters:

`adjust`: `{Function}` [optional]

An optional callback function to adjust the end-view or -cam (inclusive the optional kinetic effect). For example, it could be useful that a minimal change between start- and end-state is assured (e.g. at least 1 zoom level change) or to adjust the final state to an interval (e.g. 90°)

www.EngineeringBooksPdf.com

The function must be able to receive the following arguments:

- {nokia.maps.map.ICam|slocation.map.IView} beginState The engine's cam or view state when `beginControl()` was invoked
- {nokia.maps.map.ICam|slocation.map.IView} endState The engine's cam or view state after the control operation has completed (inclusive the kinetic effect)

The function must return the adjusted `endState` as *nokia.maps.map.ICam* or *nokia.maps.map.IView*, or `false` to terminate the control operation at once without a kinetic effect.

`static` **endInteraction()**

This method signals the end of an interaction. If the argument `kinetics` was passed to the previous call to `beginInteraction()`, the kinetic effect is performed. If no interaction is currently in progress, (`beginInteraction()` has not been triggered, or if `endInteraction()` has been called), the call to `endInteraction()` is ignored.

focus()

Gives keyboard focus to the display.

Since: 2.5

geoToPixel(coord): {*nokia.maps.util.Point*}

This method translates the received point object containing WGS84 coordinates into pixel coordinates relative to the top left corner of the map view. The coordinates of the top left corner of the map are (0,0).

Note that the result values outside the visible map area are likely to be very unreliable.

Parameters:

coord: {*nokia.maps.geo.Coordinate*}

A point object containing WGS84 coordinates to be translated into a pixel position

www.EngineeringBooksPdf.com

Returns:

{*nokia.maps.util.Point*}

An object containing the x and y pixel coordinates relative to the top left corner of the current viewport

getBestZoomLevel(bBoxes): {Number}

This method computes the minimum zoom level at which each of the given bounding boxes fit into the display area.

Parameters:

bBoxes: {*nokia.maps.geo.BoundingBox*[]}

A list of bounding boxes.

Returns:

{Number} the computed zoom level

getBoundingBox(): {*nokia.maps.geo.BoundingBox*}

This method calculates the outer bounding box of all map objects in the given `Display` instance, including all child containers. If the display does not contain any objects or child containers, the method returns `null`. If the display contains only one object that has no geographical dimensions such as a *nokia.maps.map.Marker* or *nokia.maps.map.StandardMarker*, then the returned bounding box may have the size of zero.

Note that the method does not return the bounding box of the current viewport. For this purpose, please use the method *nokia.maps.map.Display#getViewBounds*.

Returns:

{*nokia.maps.geo.BoundingBox*}

The calculated geographic outer bounding box of all map objects in the display or `null`, if the display does not contain any map objects

See: *nokia.maps.map.Display#getViewBounds*

www.EngineeringBooksPdf.com

getCam(): {*nokia.maps.map.ICam*}

This method returns the map camera

Returns:

{*nokia.maps.map.ICam*}

getComponentById(id): {*nokia.maps.map.component.Component*}

This method returns the first component with the given identifier or `null` if no component with such an identifier is currently attached to the `Display` instance.

Parameters:

id:	{String}
	The identifier of the component to retrieve

Returns:

{*nokia.maps.map.component.Component*}

The first component from the list of components with the given identifier or `null` if no component with such an identifier is currently attached to the `Display` instance

getObjectAt(x, y): {*nokia.maps.map.Object* | undefined}

A method to obtain the topmost visible object at the given position relative to the viewport's origin.

Parameters:

x:	{Number}
	The X coordinate of the pixel position
y:	{Number}
	The Y coordinate of the pixel position

Returns:

www.EngineeringBooksPdf.com

{*nokia.maps.map.Object*
| undefined}

the top most object found at the given position or undefined if no object has been found

getObjectsAt(x, y): {*nokia.maps.map.Object*[]}

A method to obtain all objects that are visible at the given pixel position relative to the viewport's origin. The list is sorted according to the drawing order of the objects. The top most object has an index of 0 in returned array.

Parameters:

x: {Number}

The X-coordinate of the pixel position

y: {Number}

The Y-coordinate of the pixel position

Returns:

{*nokia.maps.map.Object*[]}

the list of map objects found at the given pixel position

getObjectsWithin(left, top, right, bottom): {*nokia.maps.map.Object*[]}

This method returns all objects found within a rectangle defined in terms of the pixel coordinates of its top left and bottom right corners.

Parameters:

left: {Number}

The left edge of the rectangle as a number of pixels relative to viewport origin

top: {Number}

www.EngineeringBooksPdf.com

The top edge of the rectangle as a number of pixels relative to viewport origin

`right:` `{Number}`

The right edge of the rectangle as a number of pixels relative to viewport origin

`bottom:` `{Number}`

The bottom edge of the rectangle as a number of pixels relative to viewport origin

Returns:

{*nokia.maps.map.Object*[]}

A list of map objects found within the given rectangle

getView(): {*nokia.maps.map.IView*}

This method returns the map view

Returns:

{*nokia.maps.map.IView*}

getViewBounds(): {*nokia.maps.geo.BoundingBox*}

This method retrieves the outer bounding box of the map view (the smallest bounding box covering all visible points).

Returns:

{*nokia.maps.geo.BoundingBox*}

The outer bounding box of the map view.

getZoom(x, y): {Number}

This methode returns zoom level at provided screen position.

www.EngineeringBooksPdf.com

Parameters:

x:	{Number} [optional] The x-component of the screen coordinate.
y:	{Number} [optional] The y-component of the screen coordinate.

Returns:

{Number}	a zoom level at the given screen position

static interact(timeStamp, x, y, biX, biY)

This method processes an interaction based on the screen coordinates of the viewport. If beginInteraction() was triggered with a modifiers argument of COORD combined with any other modifier, but interact is called without bifocal coordinates (biX, biY) then the COORD modifier is ignored. If no interaction is currently ongoing (beginInteraction() has not been called or endInteraction() has been called) the call to interact() is ignored.

Parameters:

timeStamp:	{Number} The time stamp of interaction needed for computation of the kinetic effect.
x:	{Number} The X coordinate of the interaction.
y:	{Number} The Y coordinate of the interaction.
biX:	{Number} [optional] The second X coordinate of the interaction, only needed for bifocal interaction.
biY:	{Number} [optional]

www.EngineeringBooksPdf.com

The second Y coordinate of the interaction, only needed for bifocal interaction.

pan(startX, startY, endX, endY, animation)

This mehtod pans the map from the start point to the end point specified by the caller. Both points are defined in terms of screen coordinates. The effect is that the location under the end point moves to the screen coordinates given by the start point. This operation may use a platform specific animation if indicated by the corresponding optional animation string.

Parameters:

startX: {Number}

The x-position of the pixel relative to the top-left corner of the current view, indicating the x-coordinate of the point from which to to start panning

startY: {Number}

The y-position of the pixel relative to the top-left corner of the current view, indicating the y-coordinate of the point from which to start panning

endX: {Number}

The x-position of the pixel relative to the top-left corner of the current view, indicating the x-coordinate of the point to which to pan

endY: {Number}

The y-position of the pixel relative to the top-left corner of the current view, indicating the y-coordinates of the point to which to pan

animation: {String} [optional]

The animation to be used while modifying the view, must be a value from the list of animation types *nokia.maps.map.Display#animation*

pixelToGeo(x, y): {*nokia.maps.geo.Coordinate*}

www.EngineeringBooksPdf.com

This method translates a pixel position within the viewport to geo coordinates. The pixel position is relative to the top left corner of the viewport, (0,0), which is also the top left corner of the visible map. Note: Result values outside the visible map area are likely to be very unreliable.

Parameters:

x:	{Number} The x-coordinate of the pixel position to be translated into longitude.
y:	{Number} The y-coordinate of the pixel position to be translated into latitude.

Returns:

{*nokia.maps.geo.Coordinate*}
A point object containing the WGS84 coordinates of the caller-supplied pixel position.

removeComponent(component): {Number}

This method decrements the reference counter of the supplied component and if the counter has reached zero, the method removes the component from display.

Parameters:

component:	{*nokia.maps.map.component.Component*} A reference to the component to be removed.

Returns:

{Number}	The value of the reference counter of the component after the remove call (the element is not removed if this value is greater than zero)

Example:

```
display.removeComponent(display.getComponentById("zoom.DoubleClick"));
```

setAttributes(animation, center, level, tilt, heading)

www.EngineeringBooksPdf.com

This method sets a number of properties of the map. The properties include animation, map center, zoom level, map tilt, and map bearing. You must provide actual values only for those properties you wish to change, and `undefined` for those that should not be altered.

Parameters:

`animation`: `{String}`

The animation to be used while modifying the map attributes; must be a value from the list of animation types *nokia.maps.map.Display#animation*

`center`: {*`nokia.maps.geo.Coordinate`*}

The new map center given as an object containing geographical coordinates

`level`: `{Number}`

The new zoom level given as a value between *nokia.maps.map.Display#minZoomLevel* and *nokia.maps.map.Display#maxZoomLevel*

`tilt`: `{Number}`

The new value of map tilt in degrees given as a value between *nokia.maps.map.Display#minTilt* and *nokia.maps.map.Display#maxTilt*

`heading`: `{Number}`

The new map heading (bearing) given as a value between *nokia.maps.map.Display#minHeading* and *nokia.maps.map.Display#maxHeading*

`setBaseMapType``(provider, animate, view)`

This method sets base map type provider and optional transition between old and new provider can be involved. There should be also defined view or camera for new base map type so together with animation there should be smooth transition between old base map type and old view/camera and new ones.

Parameters:

`provider`: {*`nokia.maps.map.provider.Provider`*}

www.EngineeringBooksPdf.com

One of the available providers at nokia.maps.map.Display.availableBaseMapTypes

`animate:` {String} [optional]

the animation to be used while modifying the view; must be a value from the list of animation types *nokia.maps.map.Display#animation*

`view:` {*nokia.maps.map.IView*} [optional]

New view for new base map type

`setCam(cam, animation): {nokia.maps.map.ICam}`

This method sets the new camera for the map.

Parameters:

`cam:` {*nokia.maps.map.ICam*}

New camera

`animation:` {String} [optional]

The animation to be used while modifying the camera; must be a value from the list of animation types *nokia.maps.map.Display#animation*

Returns:

{*nokia.maps.map.ICam*}

Returns adjusted camera to closest available camera.

`setCenter(coord, animation)`

This method centers the map on the location specified by the caller. The method may use a platform specific animation if indicated by the corresponding optional animation string.

Parameters:

`coord:` {*nokia.maps.geo.Coordinate*}

www.EngineeringBooksPdf.com

The location on which to center the map specified in terms of WGS84 coordinates

`animation`: `{String}` [optional]

The animation to be used while modifying the map center; must be a value from the list of animation types *nokia.maps.map.Display#animation*

`setCopyrightAlignment``(alignment)`

This method sets the position of the copyright information.

Parameters:

`alignment`: `{String}`

The alignment relative to the map viewport, where the copyright is to be placed.

See: *nokia.maps.map.Display#copyrightAlignment*

`setHeading``(heading, animation)`

This method sets the heading (bearing) of the map. The method may use a platform-specific animation if this is indicated by the corresponding optional animation string.

Parameters:

`heading`: `{Number}`

The new value of map heading (bearing) as a number of degrees; a value between *nokia.maps.map.Display#minHeading* and *nokia.maps.map.Display#maxHeading*

`animation`: `{String}` [optional]

The animation to be used while modifying the heading; must be a value from the list of animation types *nokia.maps.map.Display#animation*.

`setPadding``(padding1, padding2, padding3, padding4)`

www.EngineeringBooksPdf.com

This method sets the property *nokia.maps.map.Display#padding*. The method accepts up to four arguments which provide padding values in the following order: top, right, bottom, left.

The caller must supply at least one argument and optionally up to four as shown in these examples:

- `setPadding(topRightBottomLeft);` - one argument/value, indicates identical padding all round
- `setPadding(topAndBottom, rightAndLeft);` - the fist argument sets top and bottom padding, the second right and left padding
- `setPadding(top, rightAndLeft, bottom);` - the second argument sets right and left padding, the first and third arguments set top and bottom padding, respectively
- `setPadding(top, right, bottom, left);` - the first argument sets top padding, the second right padding, the third bottom padding, and the fourth left padding

Parameters:

`padding1`: `{Number}`

Top padding in pixels; if this is the only argument provided, it is used also to set right, bottom and left padding (padding is identical all round); if the caller provides only two arguments, `padding1` sets both top and bottom padding

`padding2`: `{Number}` [optional]

Right padding in pixels; if `padding4` (left padding) is not specified by the caller, this argument determines both right and left padding

`padding3`: `{Number}` [optional]

Bottom padding in pixels; if not provided, its value is the same as that of `padding1` (top padding)

`padding4`: `{Number}` [optional]

Left padding in pixels; if not provided, its value is supplied by `padding2` (right padding) or `padding1` (top padding) if `padding2` is not provided

`setTilt(tilt, animation)`

This method sets the tilt of the map. It may use a platform-specific animation if indicated by the corresponding optional animation string.

Parameters:

www.EngineeringBooksPdf.com

`tilt:` `{Number}`

The new value of map tilt in degrees, a value between *nokia.maps.map.Display#minTilt* and *nokia.maps.map.Display#maxTilt*.

`animation:` `{String}` [optional]

The animation to be used while modifying the tilt; must be a value from the list of animation types *nokia.maps.map.Display#animation*.

`setView(view, animation): {nokia.maps.map.IView}`

This method sets the new view for the map.

Parameters:

`view:` `{nokia.maps.map.IView}`

New view

`animation:` `{String}` [optional]

The animation to be used while modifying the view; must be a value from the list of animation types *nokia.maps.map.Display#animation*

Returns:

`{nokia.maps.map.IView}`

Returns adjusted view to closest available view.

`setZoomLevel(level, animation, toX, toY)`

This method sets the zoom level to the value specified by the caller. The caller must provide the zoom level and can also supply the animation type and the screen coordinates of a point on which to zoom in (via the arguments `toX` and `toY`). This point may correspond, for example, to the mouse position at the time when the user scrolls the mouse wheel to zoom in or out.

Parameters:

`level:` `{Number}`

www.EngineeringBooksPdf.com

The new zoom level to be set, a value between *nokia.maps.map.Display#minZoomLevel* and *nokia.maps.map.Display#maxZoomLevel*

`animation`: `{String}` [optional]

The animation to be used while modifying the zoom level; must be a value from the list of animation types *nokia.maps.map.Display#animation*

`toX`: `{Number}` [optional]

The x-position of the pixel relative to the top-left corner of the current view to stay fixed

`toY`: `{Number}` [optional]

The y-position of the pixel relative to the top-left corner of the current view to stay fixed

`update(delay, quick): {nokia.maps.map.Display}`

This method causes the current map view to be re-rendered.

Parameters:

`delay`: `{Number}` [optional]

The maximum acceptable delay before the next frame is rendered as a number of milliseconds; if the value is zero or less, rendering occurs synchronously or at the earliest opportunity; if the argument is omitted or `undefined`, the system determines when to carry out re-rendering

`quick`: `{Boolean}` [optional, default: false]

A Boolean to indicate whether full rendering (`false`) or only quick rendering (`true` is to be performed; quick rendering uses only cached data, while full rendering may request new data and cause new or modified objects to be rendered; the argument is ignored if `delay` is omitted or `undefined`

Returns:

`{nokia.maps.map.Display}`

www.EngineeringBooksPdf.com

A reference to the given instance of `Display` (`this`).

`zoomTo(boundingBox, keepCenter, animation)`

This method zooms the map to ensure that the bounding box provided by the caller is visible in its entirety in the map viewport. The caller has the option of retaining the current map center, which may cause the zoom to be adjusted so that the bounding box is visible while the map center remains unchanged. The method may use a platform specific animation if this is indicated by the corresponding optional animation string.

Parameters:

`boundingBox`:	{*`nokia.maps.geo.BoundingBox`*}
	The bounding box that is to be visible in its entirety in the map viewport
`keepCenter`:	{`Boolean`}
	A Boolean indicating whether to keep the map center unchanged (`true`) or if the view center may change (`false`);
`animation`:	{`String`} [optional]
	The animation to be used; must be a value from the list of animation types *nokia.maps.map.Display#animation*.

Event Details

`basemapchangeend`

This event is fired to mark the end of a change from one base map type to another (for example `NORMAL` to `SATELLITE`). Until this event has been detected, the map should ignore calls to methods that alter the map view. See also *nokia.maps.map.Display.TransitionEvent*.

Event Handler Parameters:

`event`	{*`nokia.maps.map.Display.TransitionEvent`*}

`basemapchangestart`

www.EngineeringBooksPdf.com

This event is fired to mark the start of a change from one base map type to another (for example NORMAL to SATELLITE). After this event has been fired and until nokia.maps.map.Display#basemapchangeend has been detected, the map should ignore calls to methods that alter the map view. See also *nokia.maps.map.Display.TransitionEvent*.

Event Handler Parameters:	
event	{*nokia.maps.map.Display.TransitionEvent*}

displayready

This event is fired when the map ha been initialized and is ready to support interactive events, transitions and animations. No code related to map view manipulation, such as calls to *nokia.maps.map.Display#setZoomLevel*, *nokia.maps.map.Display#setCenter*, *nokia.maps.map.Display#setBaseMapType*, etc., must be allowed to run (although components or markers can be added to the map and other operations that do not affect the map view can be performed). See also *nokia.maps.map.Display.TransitionEvent*.

Event Handler Parameters:	
event	{*nokia.maps.map.Display.TransitionEvent*}

mapvalueexceeded

This event is fired if a received value exceeds the permitted range. (see *nokia.maps.map.Display.MapValueExceededEvent*).

Event Handler Parameters:	
event	{*nokia.maps.map.Display.MapValueExceededEvent*}

mapviewchange

This event is fired each time after the map has been rendered in response to a mapviewchange event (see *nokia.maps.map.Display.MapViewChangeEvent*).

www.EngineeringBooksPdf.com

The `data` property of the event object provides information on all the changes that have been effected. (see *nokia.maps.map.Display.MapViewChangeEvent#data*).

Note that a large number of `mapviewchange` events can be fired within the space of a second, therefore it is advisable to avoid time-consuming operations within `mapviewchange` listeners.

Event Handler Parameters:	
`event`	{*`nokia.maps.map.Display.MapViewChangeEvent`*}

`mapviewchangeend`

This event is fired when the map display has been rendered and all map view changes have been processed (see also *nokia.maps.map.Display.MapViewChangeEvent*). It indicates that you can safely execute more expensive operations to respond to a map view change (for example UI updates).

Event Handler Parameters:	
`event`	{*`nokia.maps.map.Display.MapViewChangeEvent`*}

`mapviewchangestart`

This event is fired immediately after the map view has been changed (see *nokia.maps.map.Display.MapViewChangeEvent*). It is fired only for the first change of the map view after the rendering of the map display has been completed.

Event Handler Parameters:	
`event`	{*`nokia.maps.map.Display.MapViewChangeEvent`*}

`resize`

This event is fired each time a change of the size of the display is detected. It is fired multiple times during a continuos resize operation (for example, if the display is being resized due to user input).

Note that resizing a map also triggers `mapviewchange` events.

www.EngineeringBooksPdf.com

Event Handler Parameters:	
event	{*nokia.maps.dom.Event*}

resizeend

This event is fired when a resizing operation has finished (when no more changes to the size of the display have been detected for a certain amount of time).

Note that resizing a map also triggers `mapviewchange` events.

Event Handler Parameters:	
event	{*nokia.maps.dom.Event*}

resizestart

This event is fired immediately after the process of resizing the display has begun and then periodically until the process has completed, when `resizeend` is fired.

Note that resizing a map also triggers `mapviewchange` events.

Event Handler Parameters:	
event	{*nokia.maps.dom.Event*}

transitionend

This event is fired immediately after a map animation has finished or a transition from one base map type to another (in the latter case the event precedes nokia.maps.map.Display#basemapchangeend). Until this event has been detected, the map should ignore calls to methods that alter the map view. See also *nokia.maps.map.Display.TransitionEvent*.

Event Handler Parameters:	
event	{*nokia.maps.map.Display.TransitionEvent*}

www.EngineeringBooksPdf.com

`transitionstart`

This event is fired immediately after a map animation starts or a transition from one base map type to another (in the latter case the event follows nokia.maps.map.Display#basemapchangestart). After this event was fired and until nokia.maps.map.Display#transitionend has been detected, the map should ignore calls to methods that alter the map view. See also *nokia.maps.map.Display.TransitionEvent*.

Event Handler Parameters:	
event	{*nokia.maps.map.Display.TransitionEvent*}

Class: BaseMapChangeEvent

This class is a member of ***nokia.maps.map.Display***.

Class Summary

This class represents an event used to signal state of switching between base map types.

[*For full details, see nokia.maps.map.Display.BaseMapChangeEvent*]

Table 112: Property Summary

Properties
baseMapData: {Object} This property represents an object which contains additional data about event: • `old` - old base map type • `current` - newly set base map type

Directly Inherited Properties

Inherited from class *nokia.maps.map.Object.Event* :

display, *displayObjects*, *displayX*, *displayY*

Inherited from class *nokia.maps.dom.Event* :

AT_TARGET, *bubbles*, *BUBBLING_PHASE*, *canBubble*, *cancelable*, *canSicker*, *CAPTURING_PHASE*, *currentTarget*, *defaultPrevented*, *eventPhase*, *namespaceURI*, *nativeEvent*, *page*, *propagation*, *PROPAGATION_OK*, *PROPAGATION_STOP*, *PROPAGATION_STOP_IMMEDIATE*, *target*, *timeStamp*, *type*

www.EngineeringBooksPdf.com

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.dom.Event* :

cancel, *clone*, *preventDefault*, *preventUnload*, *stopImmediatePropagation*, *stopPropagation*

Class Description

This class represents an event used to signal state of switching between base map types.

Constructor Details

`nokia.maps.map.Display.BaseMapChangeEvent``(defaults)`

This method initializes a new instance of `BaseMapChangeEvent`.

Parameters:

`defaults`:	`{Object}` [optional]
	see constructor parameter of *nokia.maps.dom.Event*

Property Details

`baseMapData``: {Object}`

This property represents an object which contains additional data about event:

- `old` - old base map type
- `current` - newly set base map type

Class: DisplayReadyEvent

This class is a member of ***`nokia.maps.map.Display`***.

Class Summary

This class represents an event used to signal the moment in which map is fully functional and ready to use after initialization

[*For full details, see nokia.maps.map.Display.DisplayReadyEvent*]

www.EngineeringBooksPdf.com

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.Object.Event* :

display, *displayObjects*, *displayX*, *displayY*

Inherited from class *nokia.maps.dom.Event* :

AT_TARGET, *bubbles*, *BUBBLING_PHASE*, *canBubble*, *cancelable*, *canSicker*, *CAPTURING_PHASE*, *currentTarget*, *defaultPrevented*, *eventPhase*, *namespaceURI*, *nativeEvent*, *page*, *propagation*, *PROPAGATION_OK*, *PROPAGATION_STOP*, *PROPAGATION_STOP_IMMEDIATE*, *target*, *timeStamp*, *type*

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.dom.Event* :

cancel, *clone*, *preventDefault*, *preventUnload*, *stopImmediatePropagation*, *stopPropagation*

Class Description

This class represents an event used to signal the moment in which map is fully functional and ready to use after initialization

Constructor Details

`nokia.maps.map.Display.DisplayReadyEvent``(defaults)`

This method initializes a new instance of `DisplayReadyEvent`.

Parameters:

`defaults`:	`{Object}` [optional]	
	see constructor parameter of *nokia.maps.dom.Event*	

Class: MapValueExceededEvent

This class is a member of ***`nokia.maps.map.Display`***.

www.EngineeringBooksPdf.com

Class Summary

This class represents an event used to signal that value assigned to the property is out of supported range Setting the following values can trigger this event:

- *nokia.maps.map.Display#zoomLevel*
- *nokia.maps.map.IView#zoom*
- *nokia.maps.map.ICam#fov*

[*For full details, see nokia.maps.map.Display.MapValueExceededEvent*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.Object.Event* :

display, *displayObjects*, *displayX*, *displayY*

Inherited from class *nokia.maps.dom.Event* :

AT_TARGET, *bubbles*, *BUBBLING_PHASE*, *canBubble*, *cancelable*, *canSicker*, *CAPTURING_PHASE*, *currentTarget*, *defaultPrevented*, *eventPhase*, *namespaceURI*, *nativeEvent*, *page*, *propagation*, *PROPAGATION_OK*, *PROPAGATION_STOP*, *PROPAGATION_STOP_IMMEDIATE*, *target*, *timeStamp*, *type*

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.dom.Event* :

cancel, *clone*, *preventDefault*, *preventUnload*, *stopImmediatePropagation*, *stopPropagation*

Class Description

This class represents an event used to signal that value assigned to the property is out of supported range Setting the following values can trigger this event:

- *nokia.maps.map.Display#zoomLevel*
- *nokia.maps.map.IView#zoom*
- *nokia.maps.map.ICam#fov*

www.EngineeringBooksPdf.com

Constructor Details

`nokia.maps.map.Display.MapValueExceededEvent(defaults)`

This method initializes a new instance of `MapValueExceededEvent`.

Parameters:

`defaults`: `{Object}` [optional]

see constructor parameter of *nokia.maps.dom.Event*

Class: MapViewChangeEvent

This class is a member of ***`nokia.maps.map.Display`***.

Class Summary

This class represents an event that signals changes to the map view.

[*For full details, see nokia.maps.map.Display.MapViewChangeEvent*]

Table 113: Property Summary

Properties
`data``: {Number}` This bitmask property contains cumulative information about the map view properties which were altered during display rendering.
`static` ***`MAPVIEWCHANGE_CENTER`***`: {Number}` This constant represents a bit flag that indicates a change in coordinates of the map center.
`static` ***`MAPVIEWCHANGE_HEADING`***`: {Number}` This constant represents a bit flag that indicates a change in the heading (bearing) of the map.
`static` ***`MAPVIEWCHANGE_INCLINE`***`: {Number}` This constant represents a bit flag that indicates a change of the incline.
`static` ***`MAPVIEWCHANGE_SIZE`***`: {Number}` This constant represents a bit flag that indicates a change in the size of the display.
`static` ***`MAPVIEWCHANGE_TILT`***`: {Number}` This constant represents a bit flag that indicates a change in the tilt of the map.
`static` ***`MAPVIEWCHANGE_ZOOM`***`: {Number}` This constant represents a bit flag that indicates a change in the map zoom level.

www.EngineeringBooksPdf.com

Properties

valueData: {Object}

This property represents an object which contains additional data about event:

- `propertyName` - name of the property that have been modified,
- `value` - value passed to the property,
- `min` - minimal allowed value for the property,
- `max` -maximum value of the property

Directly Inherited Properties

Inherited from class *nokia.maps.map.Object.Event* :

display, *displayObjects*, *displayX*, *displayY*

Inherited from class *nokia.maps.dom.Event* :

AT_TARGET, *bubbles*, *BUBBLING_PHASE*, *canBubble*, *cancelable*, *canSicker*, *CAPTURING_PHASE*, *currentTarget*, *defaultPrevented*, *eventPhase*, *namespaceURI*, *nativeEvent*, *page*, *propagation*, *PROPAGATION_OK*, *PROPAGATION_STOP*, *PROPAGATION_STOP_IMMEDIATE*, *target*, *timeStamp*, *type*

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.dom.Event* :

cancel, *clone*, *preventDefault*, *preventUnload*, *stopImmediatePropagation*, *stopPropagation*

Class Description

This class represents an event used to signal changes of the map view. A map view is defined by the following display properties:

- *nokia.maps.map.Display.Properties#center*
- *nokia.maps.map.Display.Properties#zoomLevel*
- *nokia.maps.map.Display.Properties#heading*
- *nokia.maps.map.Display.Properties#tilt*
- *nokia.maps.map.Display#width*
- *nokia.maps.map.Display#height*

www.EngineeringBooksPdf.com

Constructor Details

nokia.maps.map.Display.MapViewChangeEvent(defaults)

This method initializes a new instance of MapViewChangeEvent.

Parameters:

defaults:	{Object} [optional]	
	see constructor parameter of *nokia.maps.dom.Event*	

Property Details

data: {Number}

This bitmask property contains cumulative information about the map view properties which were altered during display rendering. It is only set for nokia.maps.map.Display#mapviewchange, otherwise it is always 0.

Example:

```
// Use bitwise "&" operator, to check for specific map view property
 changes:
map.addListener("mapviewchange", function (event) {
        if (event.data & event.MAPVIEWCHANGE_CENTER) {
        console.log("map view changed: center");
    }
});
```

static **MAPVIEWCHANGE_CENTER**: {Number}

This constant represents a bit flag that indicates a change in coordinates of the map center.

See: *nokia.maps.map.Display.MapViewChangeEvent#data*

static **MAPVIEWCHANGE_HEADING**: {Number}

This constant represents a bit flag that indicates a change in the heading (bearing) of the map.

See: *nokia.maps.map.Display.MapViewChangeEvent#data*

static **MAPVIEWCHANGE_INCLINE**: {Number}

www.EngineeringBooksPdf.com

This constant represents a bit flag that indicates a change of the incline.

See: *nokia.maps.map.Display.MapViewChangeEvent#data*

`static` **`MAPVIEWCHANGE_SIZE`**`: {Number}`

This constant represents a bit flag that indicates a change in the size of the display. The size of the display is defined by the properties *nokia.maps.map.Display#width* and *nokia.maps.map.Display#height*

See: *nokia.maps.map.Display.MapViewChangeEvent#data*

`static` **`MAPVIEWCHANGE_TILT`**`: {Number}`

This constant represents a bit flag that indicates a change in the tilt of the map.

See: *nokia.maps.map.Display.MapViewChangeEvent#data*

`static` **`MAPVIEWCHANGE_ZOOM`**`: {Number}`

This constant represents a bit flag that indicates a change in the map zoom level.

See: *nokia.maps.map.Display.MapViewChangeEvent#data*

`valueData``: {Object}`

This property represents an object which contains additional data about event:

- `propertyName` - name of the property that have been modified,
- `value` - value passed to the property,
- `min` - minimal allowed value for the property,
- `max` -maximum value of the property

Interface: Properties

This interface is a member of ***`nokia.maps.map.Display`***.

www.EngineeringBooksPdf.com

Interface Summary

This interface defines the properties (keys) that can be passed to the map *nokia.maps.map.Display* constructor.

[*For full details, see nokia.maps.map.Display.Properties*]

Table 114: Property Summary

Properties
baseMapType: {*nokia.maps.map.provider.Provider*} This property holds the initial base map type which is used to display the map.
center: {*nokia.maps.geo.Coordinate*} This property contains the initial coordinates of the map center.
components: {*nokia.maps.map.component.Component*[]} The array of all components that should be added to the map (to the given instance of *nokia.maps.map.Display*).
fading: {Number} This property contains the initial value indicating the length of time (in milliseconds) over which new asynchronously provided tiles are faded into the display.
fixedCenter: {Boolean} This property contains the initial value for flag indicating if the center of the map should remain unchanged if the display is resized or if padding changes.
heading: {Number} This property holds initial heading of the current view.
margin: {Number} This property contains the initial size of the supplemental rendering area.
tilt: {Number} This property holds initial tilt of the current view.
view: {*nokia.maps.map.IView*} This property holds initial view.
viewBounds: {*nokia.maps.geo.BoundingBox*} This property contains the initial boundingBox to which map should zoom to.
zoomLevel: {Number} This property holds initial zoom level of the current view.

www.EngineeringBooksPdf.com

Directly Inherited Properties

Inherited from class *nokia.maps.map.Container.Properties* :

objects

Inherited from class *nokia.maps.map.Object.Properties* :

visibility, *zIndex*

Interface Description

This interface defines the properties (keys) that can be passed to the map *nokia.maps.map.Display* constructor.

Property Details

`baseMapType`: `{`*`nokia.maps.map.provider.Provider`*`}`

This property holds the initial base map type which is used to display the map. The value must be one of the display base map type constants.

`center`: `{`*`nokia.maps.geo.Coordinate`*`}`

This property contains the initial coordinates of the map center. There should be used one of these properties: center, view or initialBoundingBox

`components`: `{`*`nokia.maps.map.component.Component`*`[]}`

The array of all components that should be added to the map (to the given instance of *nokia.maps.map.Display*).

`fading`: `{Number}`

This property contains the initial value indicating the length of time (in milliseconds) over which new asynchronously provided tiles are faded into the display. The value must be zero or a positive integer, with zero indicating no fade-in.

`fixedCenter`: `{Boolean}`

www.EngineeringBooksPdf.com

This property contains the initial value for flag indicating if the center of the map should remain unchanged if the display is resized or if padding changes.

heading: {Number}

This property holds initial heading of the current view.

margin: {Number}

This property contains the initial size of the supplemental rendering area. The renderer must be prepared to allow rapid mouse panning within the displayed area extended on each side by the given margin (in pixels).

tilt: {Number}

This property holds initial tilt of the current view.

view: {*nokia.maps.map.IView*}

This property holds initial view.

viewBounds: {*nokia.maps.geo.BoundingBox*}

This property contains the initial boundingBox to which map should zoom to. If this property is set, than center and zoomLevel properties are overwriten by it.

zoomLevel: {Number}

This property holds initial zoom level of the current view.

Class: TransitionEvent

This class is a member of ***nokia.maps.map.Display***.

Class Summary

This class represents an event used to signal state of animation.

www.EngineeringBooksPdf.com

[*For full details, see nokia.maps.map.Display.TransitionEvent*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.Object.Event* :

display, *displayObjects*, *displayX*, *displayY*

Inherited from class *nokia.maps.dom.Event* :

AT_TARGET, *bubbles*, *BUBBLING_PHASE*, *canBubble*, *cancelable*, *canSicker*, *CAPTURING_PHASE*, *currentTarget*, *defaultPrevented*, *eventPhase*, *namespaceURI*, *nativeEvent*, *page*, *propagation*, *PROPAGATION_OK*, *PROPAGATION_STOP*, *PROPAGATION_STOP_IMMEDIATE*, *target*, *timeStamp*, *type*

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.dom.Event* :

cancel, *clone*, *preventDefault*, *preventUnload*, *stopImmediatePropagation*, *stopPropagation*

Class Description

This class represents an event used to signal state of animation.

Constructor Details

`nokia.maps.map.Display.TransitionEvent``(defaults)`

This method initializes a new instance of `TransitionEvent`.

Parameters:

`defaults`:	`{Object}` [optional]	
	see constructor parameter of *nokia.maps.dom.Event*	

Interface: ICam

This interface is a member of ***`nokia.maps.map`***.

www.EngineeringBooksPdf.com

Interface Summary

This interface describes a map camera view.

[*For full details, see nokia.maps.map.ICam*]

Table 115: Property Summary

Properties
fov: {Number} The field of view (also field of vision, abbreviated FOV) of the camera in degrees in degrees ranging from 0° to +360°.
pitch: {Number | undefined} The vertical orientation of the camera (equivalent to rotation around its right axis) in degrees ranging from 0° (straight downwards) to +180° (straight upwards).
roll: {Number | undefined} The rotation of the camera around its forward direction in degrees, 0° is upright, positive angle means an inclination to the right, negative to the left.
yaw: {Number | undefined} The horizontal orientation of the camera in degrees, where 0° is northwards, 90° eastwards, 180° southwards and 270° westwards.

Directly Inherited Properties

Inherited from class *nokia.maps.geo.ICoordinate* :

altitude, *altMode*, *latitude*, *longitude*

Interface Description

This interface describes a map camera view.

Property Details

fov: {Number}

The field of view (also field of vision, abbreviated FOV) of the camera in degrees in degrees ranging from 0° to +360°.

pitch: {Number | undefined}

www.EngineeringBooksPdf.com

The vertical orientation of the camera (equivalent to rotation around its right axis) in degrees ranging from 0° (straight downwards) to +180° (straight upwards). It's also known as tilt. A value of `undefined` is treated as `0`.

`roll`: `{Number | undefined}`

The rotation of the camera around its forward direction in degrees, 0° is upright, positive angle means an inclination to the right, negative to the left. It's also known as "Dutch tilt" A value of `undefined` is treated as `0`.

`yaw`: `{Number | undefined}`

The horizontal orientation of the camera in degrees, where 0° is northwards, 90° eastwards, 180° southwards and 270° westwards. It's also known as heading. A value of `undefined` is treated as `0`.

Interface: IHitArea

This interface is a member of ***`nokia.maps.map`***.

Interface Summary

This interface defines the properties of a hit area.

[*For full details, see nokia.maps.map.IHitArea*]

Table 116: Property Summary

Properties
`readonly` ***`type`***`: {String}` The type of the area.
`readonly` ***`values`***`: {Number[]}` The type-dependent values to define the shape of the hit area.

Interface Description

This interface defines the properties of a hit area.

Property Details

`readonly` **`type`**`: {String}`

www.EngineeringBooksPdf.com

The type of the area. It has to be one of the strings "rect", "circle" or "poly". See also *http://www.w3.org/TR/REC-html40/struct/objects.html#adef-shape*.

`readonly` **`values`**`: {Number[]}`

The type-dependent values to define the shape of the hit area. The format for the different types are:

- "rect": [left, top, right, bottom]
- "circle": [centerX, centerY, radius]
- "poly": [x1, y1, x2, y2 … xN,yN]

See also *http://www.w3.org/TR/REC-html40/struct/objects.html#adef-coords*

Interface: IView

This interface is a member of ***`nokia.maps.map`***.

Interface Summary

This interface describes a map view.

[*For full details, see nokia.maps.map.IView*]

Table 117: Property Summary

Properties
`distance``: {Number}` The distance from where the view point is seen in meters.
`heading``: {Number}` The horizontal orientation from where the view point is seen, 0° means from south, 90° from west, 180° from north and 270° from east.
`incline``: {Number}` The lateral incline of the view point, 0° is upright, positive angle means an incline to the left, negative to the right.
`tilt``: {Number}` The vertical orientation from where the view point is seen in degrees, ranging from 0° (seen from above) to +180° (seen from below).
`zoom``: {Number}` The zoom level of the view.

www.EngineeringBooksPdf.com

Directly Inherited Properties

Inherited from class *nokia.maps.geo.ICoordinate* :

altitude, *altMode*, *latitude*, *longitude*

Interface Description

This interface describes a map view.

Property Details

`distance: {Number}`

The distance from where the view point is seen in meters. A value NaN indicates that zoom level should be used to compute distance.

Default Value: `NaN`

`heading: {Number}`

The horizontal orientation from where the view point is seen, 0° means from south, 90° from west, 180° from north and 270° from east. A value of `undefined` is treated as `0`.

`incline: {Number}`

The lateral incline of the view point, 0° is upright, positive angle means an incline to the left, negative to the right. A value of `undefined` is treated as `0`.

`tilt: {Number}`

The vertical orientation from where the view point is seen in degrees, ranging from 0° (seen from above) to +180° (seen from below). A value of `undefined` is treated as `0`.

`zoom: {Number}`

The zoom level of the view. A zoom level defines the size of the (theoretical rolled out) rendered equator viewed vertical. The formula to translate a zoom level into an equator size is: `size = Math.pow(2, zoom) * 256;` The formula to translate an equator size into a zoom level is: `zoom = Math.log( size / 256 ) / Math.LN2;`

www.EngineeringBooksPdf.com

Class: Marker

This class is a member of ***nokia.maps.map***.

Extends: *nokia.maps.map.Object*

Class Summary

This class represents marker, which representing one geographical coordinate on the map.

[*For full details, see nokia.maps.map.Marker*]

Table 118: Property Summary

Properties
anchor: {*nokia.maps.util.IPoint*} The anchor point of this marker.
coordinate: {*nokia.maps.geo.Coordinate*} The coordinates the marker points to.
hitArea: {*nokia.maps.map.IHitArea*} The (optional) hit area of the Marker.
icon: {*nokia.maps.gfx.Image* | Image | String} The image that indicates the marker's location on the map (makes the marker visible).

Directly Inherited Properties

Inherited from class *nokia.maps.map.Object* :

CHANGE_SPATIAL, *CHANGE_VISUAL*, *CHANGE_ZINDEX*, *visibility*, *zIndex*

Inherited from class *nokia.maps.dom.EventTarget* :

isDraggable, *isEventTarget*, *parentNode*, *parentNodes*

Inherited from class *nokia.maps.map.provider.IData* :

id

Table 119: Method Summary

Methods
getDisplayBoundingBox (display) : {*nokia.maps.util.Rectangle*}

www.EngineeringBooksPdf.com

Methods
This method retrieves the bounding box of the marker icon for the display specified by the caller.
getDisplayOffset `(display, x, y)`
The method calculates the pixel offset between the screen coordinates supplied by the caller and those of the given marker.
getIconForRendering `(doc) : {nokia.maps.gfx.Image}`
The method returns the icon for the given marker bound to the document specified by the caller.
hitTest `(display, x, y, tolerance)`
The method tests if the given marker (its hit area) covers the location specified by the caller.

Directly Inherited Methods

Inherited from class *nokia.maps.map.Object* :

destroy, *getBoundingBox*, *getDisplay*, *getParent*, *getProvider*, *getRoot*, *isVisible*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Inherited from class *nokia.maps.dom.EventTarget* :

addListener, *addListenerNS*, *addListeners*, *disableDrag*, *disableUserSelect*, *dispatch*, *enableDrag*, *enableUserSelect*, *hitTest*, *insertListener*, *insertListenerNS*, *removeAllListeners*, *removeListener*, *removeListenerNS*

Inherited from class *nokia.maps.map.provider.IData* :

getInvalidations

Event Summary

Directly Inherited Events

Inherited from class *nokia.maps.dom.MouseEventTarget* :

click, *dblclick*, *longpress*, *mousedown*, *mouseenter*, *mouseleave*, *mousemove*, *mouseout*, *mouseover*, *mouseup*, *mousewheel*

Inherited from class *nokia.maps.dom.DragEventTarget* :

drag, *dragend*, *dragenter*, *dragleave*, *dragover*, *dragstart*, *drop*

Inherited from class *nokia.maps.dom.TouchEventTarget* :

dbltap, *gesturechange*, *gestureend*, *gesturestart*, *longpress*, *tap*, *touchend*, *touchmove*, *touchstart*

www.EngineeringBooksPdf.com

Class Description

This class represents marker, which offers a means of identifying a location on the map with an icon. A marker can be visible or hidden, draggable or fixed. It can also be grouped together with other markers in a container. Markers can be event targets and can be made to react to events. Changes in their state can also be observed by registered observer objects.

Constructor Details

`nokia.maps.map.Marker``(coord, props)`

This method creates a marker object.

Parameters:

`coord`:	{*`nokia.maps.geo.Coordinate`*}
	An object containing the geographical coordinates of the marker
`props`:	{*`nokia.maps.map.Marker.Properties`*} [optional]
	An object containing the initial values of marker properties

Property Details

`anchor``: {`*`nokia.maps.util.IPoint`*`}`

The anchor point of this marker. The marker's icon is positioned on the map in relation to this anchor point. By default the anchor references the top left corner of the image.

`coordinate``: {`*`nokia.maps.geo.Coordinate`*`}`

The coordinates the marker points to.

`hitArea``: {`*`nokia.maps.map.IHitArea`*`}`

The (optional) hit area of the Marker.

Default Value:	`undefined`

`icon``: {`*`nokia.maps.gfx.Image`*` | Image | String}`

www.EngineeringBooksPdf.com

The image that indicates the marker's location on the map (makes the marker visible). NOTE: Either a URL of a bitmap image or an SVG mark-up string can be used when passing a {String} as the value of this property.

Method Details

`getDisplayBoundingBox``(display): {`*`nokia.maps.util.Rectangle`*`}`

This method retrieves the bounding box of the marker icon for the display specified by the caller.

Parameters:

`display:` `{`*`nokia.maps.map.Display`*`}`

The display for which the bounding box of the marker should be determined

Returns:

`{`*`nokia.maps.util.Rectangle`*`}`

A rectangle object containing the pixel dimensions on the marker or `null` if the marker is not part of the display specified by the caller or if the marker has no icon

`getDisplayOffset``(display, x, y)`

The method calculates the pixel offset between the screen coordinates supplied by the caller and those of the given marker.

Parameters:

`display:` `{`*`nokia.maps.map.Display`*`}`

The display for which the offset should be calculated

`x:` `{Object}`

The x position as a number of pixels from the top-left corner of the display

`y:` `{Object}`

The y position as a number of pixels from the top-left corner of the display

Returns:

www.EngineeringBooksPdf.com

An object (`nokia.maps.util.Point`) that represents the difference between the screen coordinates supplied by the caller and the screen coordinates of the given marker, or `null` if the marker is not visible in the specified display

`getIconForRendering(doc): {nokia.maps.gfx.Image}`

The method returns the icon for the given marker bound to the document specified by the caller.

Parameters:

`doc:` `{Document}` [optional, default: document]

The document to which the given marker is attached

Returns:

`{nokia.maps.gfx.Image}`

The icon image for the marker bound to the given document

`hitTest(display, x, y, tolerance)`

The method tests if the given marker (its hit area) covers the location specified by the caller. If no hit area (`map.Marker.hitArea`) is defined, the entire screen bounding box within which of the marker appears is taken into account.

Parameters:

`display:` `{nokia.maps.map.Display}`

The display within which to carry out the check

`x:` `{Number}`

The X component of the screen coordinate in pixels

`y:` `{Number}`

The Y component of the screen coordinate in pixels

`tolerance:` `{Number}` [optional, default: 0]

www.EngineeringBooksPdf.com

The tolerance to use for hit testing as a number of pixels

Returns:

A {Boolean} whose value indicates if the given marker covers the specified location (`true`) or not (`false`)

Interface: Properties

This interface is a member of ***`nokia.maps.map.Marker`***.

Interface Summary

This interface defines the properties (keys) that can be passed to the constructor of all classes derived from *`nokia.maps.map.Marker`*.

[*For full details, see nokia.maps.map.Marker.Properties*]

Table 120: Property Summary

Properties
`anchor`: {*`nokia.maps.util.IPoint`*} The initial anchor point of this marker.
`draggable`: {`Boolean`} This flag indicates if Marker will be draggable or not.
`hitArea`: {*`nokia.maps.map.IHitArea`*} The initial hit area of the created Marker.
`icon`: {*`nokia.maps.gfx.Image`* | `Image` | `String`} The image that indicates the marker's location on the map (makes the marker visible).

Directly Inherited Properties

Inherited from class *nokia.maps.map.Object.Properties* :

visibility, *zIndex*

Interface Description

This interface defines the properties (keys) that can be passed to the constructor of all classes derived from *`nokia.maps.map.Marker`*.

www.EngineeringBooksPdf.com

Property Details

anchor: {*nokia.maps.util.IPoint*}

The initial anchor point of this marker. The marker's icon is positioned on the map in relation to this anchor point. By default the anchor references the top left corner of the image.

draggable: {Boolean}

This flag indicates if Marker will be draggable or not.

hitArea: {*nokia.maps.map.IHitArea*}

The initial hit area of the created Marker.

icon: {*nokia.maps.gfx.Image* | Image | String}

The image that indicates the marker's location on the map (makes the marker visible). NOTE: Either a URL of a bitmap image or an SVG mark-up string can be used when passing a {String} as the value of this property. If omitted a standardized icon is used.

Class: Object

This class is a member of ***nokia.maps.map***.

Extends: *nokia.maps.dom.EventTarget*, *nokia.maps.map.provider.IData*, *nokia.maps.util.OObject*

Class Summary

`Object` is the abstract base class for the map itself and for all visual objects that can be displayed in the map.

[*For full details, see nokia.maps.map.Object*]

Table 121: Property Summary

Properties
CHANGE_SPATIAL: {Number} This property represents the invalidation type for spatial changes.
readonly static ***CHANGE_SPATIAL***: {Number}

www.EngineeringBooksPdf.com

Properties
This constant represents the invalidation type for spatial changes.
`readonly static` ***`CHANGE_VISUAL`***`: {Number}` This constant represents the invalidation type for visual changes.
`CHANGE_VISUAL``: {Number}` This property represents the invalidation type for visual changes.
`CHANGE_ZINDEX``: {Number}` This property represents the invalidation type for z-index changes.
`readonly static` ***`CHANGE_ZINDEX`***`: {Number}` This constant represents the invalidation type for z-index changes.
`visibility``: {Boolean}` This property is a flag that determines the visibility of the given `Object` instance.
`zIndex``: {Number}` This property represents the z-index relative to the container.

Directly Inherited Properties

Inherited from class *nokia.maps.dom.EventTarget* :

isDraggable, *isEventTarget*, *parentNode*, *parentNodes*

Inherited from class *nokia.maps.map.provider.IData* :

id

Table 122: Method Summary

Methods
`destroy` `()` This method cleans the given instance of `Object` and removes it from `Providers` to which it is connected.
`getBoundingBox` `() : {`*`nokia.maps.geo.BoundingBox`*`}` This method calculates the outer geographic bounding box of the given object.
`getDisplay` `() : {`*`nokia.maps.map.Display`*`}` This method returns the Display instance to which it is attached through the object hierarchy or null if it is not attached to any display.
`getParent` `() : {`*`nokia.maps.map.Object`*`}` This method returns an instance of `map.Container` in which the map object is attached.

www.EngineeringBooksPdf.com

Methods
getProvider `() : {nokia.maps.map.provider.Provider}` This method retrieves the instances of `map.provider.Provider` to which the given object is connected.
getRoot `() : {nokia.maps.map.Object}` This method returns the root object in which the map object is attached or the object itself.
isVisible `()` This method checks if the given map object is visible.

Directly Inherited Methods

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Inherited from class *nokia.maps.dom.EventTarget* :

addListener, *addListenerNS*, *addListeners*, *disableDrag*, *disableUserSelect*, *dispatch*, *enableDrag*, *enableUserSelect*, *hitTest*, *insertListener*, *insertListenerNS*, *removeAllListeners*, *removeListener*, *removeListenerNS*

Inherited from class *nokia.maps.map.provider.IData* :

getInvalidations

Event Summary

Directly Inherited Events

Inherited from class *nokia.maps.dom.MouseEventTarget* :

click, *dblclick*, *longpress*, *mousedown*, *mouseenter*, *mouseleave*, *mousemove*, *mouseout*, *mouseover*, *mouseup*, *mousewheel*

Inherited from class *nokia.maps.dom.DragEventTarget* :

drag, *dragend*, *dragenter*, *dragleave*, *dragover*, *dragstart*, *drop*

Inherited from class *nokia.maps.dom.TouchEventTarget* :

dbltap, *gesturechange*, *gestureend*, *gesturestart*, *longpress*, *tap*, *touchend*, *touchmove*, *touchstart*

www.EngineeringBooksPdf.com

Class Description

`Object` is the abstract base class for the map itself and for all visual objects that can be displayed in the map. It is responsible for identifying UI state changes and automatically triggering a redraw. Redraws are platform specific in terms of how and when they are performed.

Object instance can be attached to only one map in given time. When object is added to container the container checks that given Object is 'free to use', e.g. not attached in any map. If so Object is removed from previous map instance (e.g. parent container) and than attached to new one parent container.

Constructor Details

`nokia.maps.map.Object(props)`

This method creates an instance of `Object`, which is the base class for the map as well as all visual objects shown in the map.

Parameters:

`props:`	{*`nokia.maps.map.Object.Properties`*} [optional]
	An object providing the initial values of the properties it contains

Property Details

`CHANGE_SPATIAL: {Number}`

This property represents the invalidation type for spatial changes.

`readonly static CHANGE_SPATIAL: {Number}`

This constant represents the invalidation type for spatial changes.

`readonly static CHANGE_VISUAL: {Number}`

This constant represents the invalidation type for visual changes.

`CHANGE_VISUAL: {Number}`

This property represents the invalidation type for visual changes.

www.EngineeringBooksPdf.com

CHANGE_ZINDEX: {Number}

This property represents the invalidation type for z-index changes.

readonly static **CHANGE_ZINDEX**: {Number}

This constant represents the invalidation type for z-index changes.

visibility: {Boolean}

This property is a flag that determines the visibility of the given `Object` instance. An object is visible if this property is `true` and if all its parent objects are visible (see also nokia.maps.map.Object.isVisible()).

zIndex: {Number}

This property represents the z-index relative to the container. It is used to specify the stacking order within the container.

Objects with the highest values are placed on top (closer to the viewer). The overall stack order is defined hierarchically according to the z-index: objects are ordered within the container to which they belong, and containers are ordered within the `Display` instance. If a container A has a higher z-index than container B, objects that belong to A appear closer to the viewer than any object in B, even if all or some of the objects in B may have a higher z-index than some or all objects in A.

Markers are treated differently than Spatial objects so than zIndex property is used for sorting Markers and Spatial object in different layers and marker layer is rendered always above object layer.

Method Details

destroy()

This method cleans the given instance of `Object` and removes it from `Providers` to which it is connected. It is always better to call this method when the instance is not needed instead of removing the instance reference only.

getBoundingBox(): {*nokia.maps.geo.BoundingBox*}

www.EngineeringBooksPdf.com

This method calculates the outer geographic bounding box of the given object. If the object has no geographic dimensions, `null` is returned. Note that the returned bounding box might have the size of zero, if the object is a one-dimensional object. This happens for example for instances of *nokia.maps.map.Marker* and *nokia.maps.map.StandardMarker*, because they are point objects with a pure visual (pixel base) representation.

Returns:

{*nokia.maps.geo.BoundingBox*}

The calculated geographic outer bounding box object or `null`, if the object has no geographic dimensions

`getDisplay``(): {`*`nokia.maps.map.Display`*`}`

This method returns the Display instance to which it is attached through the object hierarchy or null if it is not attached to any display.

Returns:

{*nokia.maps.map.Display*}

The Display instance or `null` if the map object is not attached to any display

`getParent``(): {`*`nokia.maps.map.Object`*`}`

This method returns an instance of `map.Container` in which the map object is attached.

Returns:

{*nokia.maps.map.Object*}

The parent object or `undefined` if the map object has no parent (not added to any Provider)

`getProvider``(): {`*`nokia.maps.map.provider.Provider`*`}`

This method retrieves the instances of `map.provider.Provider` to which the given object is connected.

Returns:

www.EngineeringBooksPdf.com

{*nokia.maps.map.provider.Provider*}

An provider instance to which object is connected

getRoot(): {*nokia.maps.map.Object*}

This method returns the root object in which the map object is attached or the object itself.

Since: 2.5

Returns:

{*nokia.maps.map.Object*}

The root object

isVisible()

This method checks if the given map object is visible. The method returns `true` provided that the object itself is visible, all its parent objects are visible, and if the object is attached to a map (parent chain ends with a map). The returned value is valid for the attached instance of `nokia.maps.map.provider.Provider`.

Returns:

A {Boolean} value, `true` if the given map object is currently visible.

Interface: Event

This interface is a member of ***nokia.maps.map.Object***.

Extends: *nokia.maps.dom.Event*

Interface Summary

This class defines the interface that must be supported by all events fired by a *nokia.maps.map.Object* or its derived classes, including the *nokia.maps.map.Display* class.

[*For full details, see nokia.maps.map.Object.Event*]

www.EngineeringBooksPdf.com

Table 123: Property Summary

Properties
display: {*nokia.maps.map.Display*} This property contains the reference to the display within which the event occurred, if applicable.
displayObjects: {*nokia.maps.map.Object*[]} This property holds an array of all map objects under the event position reflecting the z-index order of the objects (the first element in the array is the topmost visible object, and the last one is the object with the highest z-index).
displayX: {Number} This property holds the horizontal pixel position where the event occurred relative to the top-left corner of the display associated with the event.
displayY: {Number} This property holds the vertical pixel position where the event occurred relative to the to the top-left corner of the display associated with the event.

Directly Inherited Properties

Inherited from class *nokia.maps.dom.Event* :

AT_TARGET, *bubbles*, *BUBBLING_PHASE*, *canBubble*, *cancelable*, *canSicker*, *CAPTURING_PHASE*, *currentTarget*, *defaultPrevented*, *eventPhase*, *namespaceURI*, *nativeEvent*, *page*, *propagation*, *PROPAGATION_OK*, *PROPAGATION_STOP*, *PROPAGATION_STOP_IMMEDIATE*, *target*, *timeStamp*, *type*

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.dom.Event* :

cancel, *clone*, *preventDefault*, *preventUnload*, *stopImmediatePropagation*, *stopPropagation*

Interface Description

This class defines the interface that must be supported by all events fired by a *nokia.maps.map.Object* or its derived classes, including the *nokia.maps.map.Display* class. These classes therefore implement this interface.

This class does not exist, but is documented here to record the event properties. All events are ultimately instances of the class *nokia.maps.dom.Event* and have the properties described here.

www.EngineeringBooksPdf.com

Before you continue reading, please ensure that you are familiar with the normal DOM event behavior as explained, for example, in the documentation for the class *nokia.maps.dom.EventTarget* or in the corresponding W3C *DOM Event Level 3* specification

Dispatch

A *nokia.maps.map.Object.Event* has the property `display` to identify the *nokia.maps.map.Display* instance in which the event occurred to help establish the correct *propagation path*. For example, if the user clicks on a marker, a DOM click event with the `map.Display` instance as target is generated by the browser, but because the browser does not know about the markers (at least in some rendering engines), the display itself must find the map objects under the mouse cursor and modify the *propagation path*. Furthermore, it needs to apply the *nokia.maps.map.Object.Event* interface to that DOM event with the special properties `display`, `displayX`, `displayY` and `displayObjects`.

The *nokia.maps.dom.EventTarget#dispatch*( ) method does not generate the *propagation path* simply by following the property `parentNode`. Instead, it intercepts the dispatched events, allows the class *nokia.maps.map.Display* to find the target and build the *propagation path* so that map objects under the cursor are treated like normal DOM nodes.

Separate the data model from the view tree

The modified event dispatch model permits dispatch of visual events that are separate from the data model events. In addition to the hierarchy of map objects within instances of `map.Display`, a further document hierarchy for all map objects may be present and these objects can act as event targets. Therefore, a single data model can be maintained alongside different display-related view models. This is a strength of the event model. While remaining compatible with the DOM event system, it allows you to maintain a document data model alongside the visual representation, using the same objects for the view trees as well as for the data model.

In addition, events can flow over into the normal DOM tree so that you can capture events fired by the display as well as those fired within the normal DOM tree. For example, if a `div` element holds both the map and the UI components, you can use the same listeners to process map events and UI events.

Listener notes

Registering listeners on map objects is similar to registering listeners on DOM nodes, using the class *nokia.maps.dom.EventTarget*. Note that the listeners are called for all events that reach the map objects. Therefore you must check the property `display` to see if an event is related to a display or a DOM event, and to which `map.Display` instance it belongs.

www.EngineeringBooksPdf.com

Property Details

`display`: {*`nokia.maps.map.Display`*}

This property contains the reference to the display within which the event occurred, if applicable.

`displayObjects`: {*`nokia.maps.map.Object`*[]}

This property holds an array of all map objects under the event position reflecting the z-index order of the objects (the first element in the array is the topmost visible object, and the last one is the object with the highest z-index). Note that the event position can be, for example the mouse cursor position, the user's finger touch position of a touch screen, or any other position related to the event (see *nokia.maps.map.Object.Event#displayX* and *nokia.maps.map.Object.Event#displayY*).

This property may be undefined, if the event is not related to a display or a specific position, which is the case, for example, for keyboard events, map view change events or some customer defined events.

`displayX`: {Number}

This property holds the horizontal pixel position where the event occurred relative to the top-left corner of the display associated with the event.

This property may be undefined, if the event is not related to a display or a specific position, which is the case, for example, for keyboard events, map view change events or some customer defined events.

`displayY`: {Number}

This property holds the vertical pixel position where the event occurred relative to the to the top-left corner of the display associated with the event.

This property may be undefined, if the event is not related to a display or a specific position, which is the case, for example, for keyboard events, map view change events or some customer defined events.

Interface: Properties

This interface is a member of ***`nokia.maps.map.Object`***.

www.EngineeringBooksPdf.com

Interface Summary

This interface defines the properties (keys) that can be passed to the constructor of all classes derived from `nokia.maps.map.Object`.

[*For full details, see nokia.maps.map.Object.Properties*]

Table 124: Property Summary

Properties
visibility: {Boolean} This property is a flag that determines the initial visibility of the created `Object` instance.
zIndex: {Number} This property holds the initial value of the z-index relative to the siblings in parent container.

Interface Description

This interface defines the properties (keys) that can be passed to the constructor of all classes derived from `nokia.maps.map.Object`.

Property Details

`visibility`: {Boolean}

This property is a flag that determines the initial visibility of the created `Object` instance. An object are visible if this property is `true` and if all its parent objects are visible (see also nokia.maps.map.Object.isVisible()).

`zIndex`: {Number}

This property holds the initial value of the z-index relative to the siblings in parent container. The z-index is used to specify the stacking order within a container. Objects with the highest values are placed on top (closer to the viewer). The overall stack order is defined hierarchically according to the z-index: objects are ordered within the container to which they belong, and containers are ordered within the `Display` instance. If a container A has a higher z-index than container B, objects that belong to A appear closer to the viewer than any object in B, even if all or some of the objects in B may have a higher z-index than some or all objects in A.

Class: Polygon

This class is a member of ***`nokia.maps.map`***.

www.EngineeringBooksPdf.com

Extends: *nokia.maps.map.Polyline*

Class Summary

This class represent visible polygon on map.

[*For full details, see nokia.maps.map.Polygon*]

Table 125: Property Summary

Properties
brush: {*nokia.maps.util.Brush*} This property specifies the brush used to fill the shape of the polygon.

Directly Inherited Properties

Inherited from class *nokia.maps.map.Polyline* :

arrows, *path*, *pen*

Inherited from class *nokia.maps.map.Spatial* :

simplify

Inherited from class *nokia.maps.map.Object* :

CHANGE_SPATIAL, *CHANGE_VISUAL*, *CHANGE_ZINDEX*, *visibility*, *zIndex*

Inherited from class *nokia.maps.dom.EventTarget* :

isDraggable, *isEventTarget*, *parentNode*, *parentNodes*

Inherited from class *nokia.maps.map.provider.IData* :

id

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.Polyline* :

getNearest, *getNearestIndex*

Inherited from class *nokia.maps.map.Object* :

destroy, *getBoundingBox*, *getDisplay*, *getParent*, *getProvider*, *getRoot*, *isVisible*

Inherited from class *nokia.maps.util.OObject* :

www.EngineeringBooksPdf.com

addObserver, *get*, *remove*, *removeObserver*, *set*

Inherited from class *nokia.maps.dom.EventTarget* :

addListener, *addListenerNS*, *addListeners*, *disableDrag*, *disableUserSelect*, *dispatch*, *enableDrag*, *enableUserSelect*, *hitTest*, *insertListener*, *insertListenerNS*, *removeAllListeners*, *removeListener*, *removeListenerNS*

Inherited from class *nokia.maps.map.provider.IData* :

getInvalidations

Event Summary

Directly Inherited Events

Inherited from class *nokia.maps.dom.MouseEventTarget* :

click, *dblclick*, *longpress*, *mousedown*, *mouseenter*, *mouseleave*, *mousemove*, *mouseout*, *mouseover*, *mouseup*, *mousewheel*

Inherited from class *nokia.maps.dom.DragEventTarget* :

drag, *dragend*, *dragenter*, *dragleave*, *dragover*, *dragstart*, *drop*

Inherited from class *nokia.maps.dom.TouchEventTarget* :

dbltap, *gesturechange*, *gestureend*, *gesturestart*, *longpress*, *tap*, *touchend*, *touchmove*, *touchstart*

Class Description

This class represents map object that is, in effect, a closed polyline (*`nokia.maps.map.Polyline`*). In other words, the last point in the array of points that define the line is connected with the first point.

Constructor Details

`nokia.maps.map.Polygon``(path, props)`

This method initializes an instance of `Polygon`. You can use it to set the points that define the polygon and set the brush.

Parameters:

`path`: {*`nokia.maps.geo.Strip`* | *`nokia.maps.geo.Coordinate`*[]}

An object containing the points (geographical locations) that define the polygon; the object can be an instance of `nokia.maps.geo.Strip` or an array

www.EngineeringBooksPdf.com

	of objects, each containing the latitude and longitude of a geographical location
`props:`	{*`nokia.maps.map.Polygon.Properties`*} [optional] An object that names polygon properties to initialize and provides their values

Property Details

`brush`: {*`nokia.maps.util.Brush`*}

This property specifies the brush used to fill the shape of the polygon. See *nokia.maps.util.Brush* for default values.

Interface: Properties

This interface is a member of ***`nokia.maps.map.Polygon`***.

Interface Summary

This interface defines the properties (keys) that can be passed to the constructor of *`nokia.maps.map.Polygon`*.

[*For full details, see nokia.maps.map.Polygon.Properties*]

Table 126: Property Summary

Properties
`brush`: {*`nokia.maps.util.IBrush`*} This property specifies the brush used to fill the shape of the polygon.

Directly Inherited Properties

Inherited from class *nokia.maps.map.Polyline.Properties* :

arrows, *pen*

Inherited from class *nokia.maps.map.Spatial.Properties* :

simplify

Inherited from class *nokia.maps.map.Object.Properties* :

visibility, *zIndex*

www.EngineeringBooksPdf.com

Interface Description

This interface defines the properties (keys) that can be passed to the constructor of *nokia.maps.map.Polygon*.

Property Details

brush: {*nokia.maps.util.IBrush*}

This property specifies the brush used to fill the shape of the polygon.

Class: Polyline

This class is a member of ***nokia.maps.map***.

Class Summary

This class represents a visible line that connects a number of points on the map.

[*For full details, see nokia.maps.map.Polyline*]

Table 127: Property Summary

Properties
arrows: {*nokia.maps.util.Arrows*} This property holds an object that defines the attributes of arrows drawn recurrently on top of the polyline on the map to indicate the direction (for example the direction of travel along a route).
path: {*nokia.maps.geo.Shape*} This property holds a `nokia.maps.geo.Shape` object that contains the vertices for the polyline.
pen: {*nokia.maps.util.Pen*} This property holds a `nokia.maps.util.Pen` object that defines the drawing properties of the given `Polyline` (stroke color, line width, etc.

Directly Inherited Properties

Inherited from class *nokia.maps.map.Spatial* :

simplify

Inherited from class *nokia.maps.map.Object* :

CHANGE_SPATIAL, *CHANGE_VISUAL*, *CHANGE_ZINDEX*, *visibility*, *zIndex*

Inherited from class *nokia.maps.dom.EventTarget* :

www.EngineeringBooksPdf.com

isDraggable, *isEventTarget*, *parentNode*, *parentNodes*

Inherited from class *nokia.maps.map.provider.IData* :

id

Table 128: Method Summary

Methods
getNearest `(coord) : {nokia.maps.geo.Coordinate}` This method retrieves the point in the given instance of `Polyline` that is the closest to the location specified by the caller.
getNearestIndex `(coord) : {Number}` This method obtains the index of a point that belongs to the given instance of `Polyline` and lies closest to the location specified by the caller.

Directly Inherited Methods

Inherited from class *nokia.maps.map.Object* :

destroy, *getBoundingBox*, *getDisplay*, *getParent*, *getProvider*, *getRoot*, *isVisible*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Inherited from class *nokia.maps.dom.EventTarget* :

addListener, *addListenerNS*, *addListeners*, *disableDrag*, *disableUserSelect*, *dispatch*, *enableDrag*, *enableUserSelect*, *hitTest*, *insertListener*, *insertListenerNS*, *removeAllListeners*, *removeListener*, *removeListenerNS*

Inherited from class *nokia.maps.map.provider.IData* :

getInvalidations

Event Summary

Directly Inherited Events

Inherited from class *nokia.maps.dom.MouseEventTarget* :

click, *dblclick*, *longpress*, *mousedown*, *mouseenter*, *mouseleave*, *mousemove*, *mouseout*, *mouseover*, *mouseup*, *mousewheel*

Inherited from class *nokia.maps.dom.DragEventTarget* :

drag, *dragend*, *dragenter*, *dragleave*, *dragover*, *dragstart*, *drop*

www.EngineeringBooksPdf.com

Inherited from class *nokia.maps.dom.TouchEventTarget* :

dbltap, *gesturechange*, *gestureend*, *gesturestart*, *longpress*, *tap*, *touchend*, *touchmove*, *touchstart*

Class Description

`Polyline` represents a visible line that connects two or more points on the map. The section that connects any two consecutive points is always straight and therefore indicates the shortest distance between those points.

Constructor Details

`nokia.maps.map.Polyline``(coords, props)`

This method creates and initializes an instance of `Polyline`.

Parameters:

`coords`:	{*`nokia.maps.geo.Strip`* | *`nokia.maps.geo.Shape`* | *`nokia.maps.geo.Coordinate`*`[]`} An object containing the points (geographical locations) that define the polyline; the object can be an instance of `nokia.maps.geo.Strip`, a `nokia.maps.geo.Shape` or an array of objects, each containing the latitude and longitude of a geographical location.
`props`:	{*`nokia.maps.map.Polyline.Properties`*} [optional] An object that names `Polyline` properties and their initial values.

Property Details

`arrows`: {*`nokia.maps.util.Arrows`*}

This property holds an object that defines the attributes of arrows drawn recurrently on top of the polyline on the map to indicate the direction (for example the direction of travel along a route). If the property is not specified or if it is set to an invalid value, no arrows are drawn.

`path`: {*`nokia.maps.geo.Shape`*}

This property holds a `nokia.maps.geo.Shape` object that contains the vertices for the polyline.

www.EngineeringBooksPdf.com

pen: {*nokia.maps.util.Pen*}

This property holds a `nokia.maps.util.Pen` object that defines the drawing properties of the given `Polyline` (stroke color, line width, etc.) See *nokia.maps.util.Pen* for default values.

Method Details

getNearest(coord): {*nokia.maps.geo.Coordinate*}

This method retrieves the point in the given instance of `Polyline` that is the closest to the location specified by the caller.

Parameters:

coord:	{*nokia.maps.geo.Coordinate*} An object containing the coordinates of a location for which to find the closest point on the polyline.

Returns:

{*nokia.maps.geo.Coordinate*}	An instance of `nokia.maps.geo.Coordinate` containing the latitude and longitude of a point on the polyline.

getNearestIndex(coord): {Number}

This method obtains the index of a point that belongs to the given instance of `Polyline` and lies closest to the location specified by the caller.

Parameters:

coord:	{*nokia.maps.geo.Coordinate*} An object containing the coordinates of a location.

Returns:

{Number}	A number representing the index of the point on the polyline that is closest to the location provided by the caller.

www.EngineeringBooksPdf.com

Interface: Properties

This interface is a member of ***nokia.maps.map.Polyline***.

Interface Summary

This interface defines the properties (keys) that can be passed to the constructor of *nokia.maps.map.Polyline*.

[*For full details, see nokia.maps.map.Polyline.Properties*]

Table 129: Property Summary

Properties
arrows: {*nokia.maps.util.Arrows*} This property holds an object that defines the attributes of arrows drawn recurrently on top of the polyline on the map to indicate the direction (for example the direction of travel along a route).
pen: {*nokia.maps.util.IPen*} This property holds a Pen object that defines the drawing properties of the given Polyline (stroke color, line width, etc.

Directly Inherited Properties

Inherited from class *nokia.maps.map.Spatial.Properties* :

simplify

Inherited from class *nokia.maps.map.Object.Properties* :

visibility, *zIndex*

Interface Description

This interface defines the properties (keys) that can be passed to the constructor of *nokia.maps.map.Polyline*.

Property Details

arrows: {*nokia.maps.util.Arrows*}

This property holds an object that defines the attributes of arrows drawn recurrently on top of the polyline on the map to indicate the direction (for example the direction of travel along a route). If the property is not specified or if it is set to an invalid value, no arrows are drawn.

www.EngineeringBooksPdf.com

pen: {*nokia.maps.util.IPen*}

This property holds a Pen object that defines the drawing properties of the given Polyline (stroke color, line width, etc.)

Class: Rectangle

This class is a member of ***nokia.maps.map***.

Class Summary

This class represents visible rectangular area on map.

[*For full details, see nokia.maps.map.Rectangle*]

Table 130: Property Summary

Properties
boundingBox: {*nokia.maps.geo.BoundingBox*} The bounds of the rectangle.
simplify: {Number} This property overrides *nokia.maps.map.Spatial#simplify*.

Directly Inherited Properties

Inherited from class *nokia.maps.map.Polygon* :

brush

Inherited from class *nokia.maps.map.Polyline* :

arrows, *path*, *pen*

Inherited from class *nokia.maps.map.Spatial* :

simplify

Inherited from class *nokia.maps.map.Object* :

CHANGE_SPATIAL, *CHANGE_VISUAL*, *CHANGE_ZINDEX*, *visibility*, *zIndex*

Inherited from class *nokia.maps.dom.EventTarget* :

isDraggable, *isEventTarget*, *parentNode*, *parentNodes*

Inherited from class *nokia.maps.map.provider.IData* :

id

www.EngineeringBooksPdf.com

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.Polyline* :

getNearest, *getNearestIndex*

Inherited from class *nokia.maps.map.Object* :

destroy, *getBoundingBox*, *getDisplay*, *getParent*, *getProvider*, *getRoot*, *isVisible*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Inherited from class *nokia.maps.dom.EventTarget* :

addListener, *addListenerNS*, *addListeners*, *disableDrag*, *disableUserSelect*, *dispatch*, *enableDrag*, *enableUserSelect*, *hitTest*, *insertListener*, *insertListenerNS*, *removeAllListeners*, *removeListener*, *removeListenerNS*

Inherited from class *nokia.maps.map.provider.IData* :

getInvalidations

Event Summary

Directly Inherited Events

Inherited from class *nokia.maps.dom.MouseEventTarget* :

click, *dblclick*, *longpress*, *mousedown*, *mouseenter*, *mouseleave*, *mousemove*, *mouseout*, *mouseover*, *mouseup*, *mousewheel*

Inherited from class *nokia.maps.dom.DragEventTarget* :

drag, *dragend*, *dragenter*, *dragleave*, *dragover*, *dragstart*, *drop*

Inherited from class *nokia.maps.dom.TouchEventTarget* :

dbltap, *gesturechange*, *gestureend*, *gesturestart*, *longpress*, *tap*, *touchend*, *touchmove*, *touchstart*

Class Description

The class defines a map object with a rectangular shape.

Constructor Details

`nokia.maps.map.Rectangle``(bounds, props)`

www.EngineeringBooksPdf.com

This method initializes an instance of `nokia.maps.map.Rectangle` setting the bounding box for the object and other properties specified by the caller.

Parameters:

`bounds`:	{*`nokia.maps.geo.BoundingBox`*} A bounding box object that determines the location of the rectangle and its size
`props`:	{*`nokia.maps.map.Rectangle.Properties`*} [optional] An object that names the properties of the rectangle to initialize and provides their values

Property Details

`boundingBox`: {*`nokia.maps.geo.BoundingBox`*}

The bounds of the rectangle.

`simplify`: {`Number`}

This property overrides *nokia.maps.map.Spatial#simplify*. The value of this property is 0 by default, because it is not visually nice to simplify rectangles. It is also not necessary, because Rectangle always consists of 4 points.

Default Value: `0`

Interface: Properties

This interface is a member of ***`nokia.maps.map.Rectangle`***.

Interface Summary

This interface defines the properties (keys) that can be passed to the constructor for *`nokia.maps.map.Rectangle`*.

[*For full details, see nokia.maps.map.Rectangle.Properties*]

Property Summary

Directly Inherited Properties

www.EngineeringBooksPdf.com

Inherited from class *nokia.maps.map.Polygon.Properties* :

brush

Inherited from class *nokia.maps.map.Polyline.Properties* :

arrows, *pen*

Inherited from class *nokia.maps.map.Spatial.Properties* :

simplify

Inherited from class *nokia.maps.map.Object.Properties* :

visibility, *zIndex*

Interface Description

This interface defines the properties (keys) that can be passed to the constructor for `nokia.maps.map.Rectangle`.

Class: Spatial

This class is a member of ***nokia.maps.map***.

Extends: *nokia.maps.map.Object*

Class Summary

This class is a base class for all geo spatial map objects.

[*For full details, see nokia.maps.map.Spatial*]

Table 131: Property Summary

Properties
simplify: {Number} The value of this property is specified as a number of pixels and indicates if and how much the rendering result is to be simplified.

Directly Inherited Properties

Inherited from class *nokia.maps.map.Object* :

CHANGE_SPATIAL, *CHANGE_VISUAL*, *CHANGE_ZINDEX*, *visibility*, *zIndex*

Inherited from class *nokia.maps.dom.EventTarget* :

isDraggable, *isEventTarget*, *parentNode*, *parentNodes*

www.EngineeringBooksPdf.com

Inherited from class *nokia.maps.map.provider.IData* :

id

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.Object* :

destroy, *getBoundingBox*, *getDisplay*, *getParent*, *getProvider*, *getRoot*, *isVisible*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Inherited from class *nokia.maps.dom.EventTarget* :

addListener, *addListenerNS*, *addListeners*, *disableDrag*, *disableUserSelect*, *dispatch*, *enableDrag*, *enableUserSelect*, *hitTest*, *insertListener*, *insertListenerNS*, *removeAllListeners*, *removeListener*, *removeListenerNS*

Inherited from class *nokia.maps.map.provider.IData* :

getInvalidations

Event Summary

Directly Inherited Events

Inherited from class *nokia.maps.dom.MouseEventTarget* :

click, *dblclick*, *longpress*, *mousedown*, *mouseenter*, *mouseleave*, *mousemove*, *mouseout*, *mouseover*, *mouseup*, *mousewheel*

Inherited from class *nokia.maps.dom.DragEventTarget* :

drag, *dragend*, *dragenter*, *dragleave*, *dragover*, *dragstart*, *drop*

Inherited from class *nokia.maps.dom.TouchEventTarget* :

dbltap, *gesturechange*, *gestureend*, *gesturestart*, *longpress*, *tap*, *touchend*, *touchmove*, *touchstart*

Class Description

This is an abstract base class for all objects that have a geo-spatial dimension.

www.EngineeringBooksPdf.com

Constructor Details

nokia.maps.map.Spatial(props)

This method initializes an object based on this class.

Parameters:

props:	{*nokia.maps.map.Object.Properties*} An object specifying the initial values of the properties defined on this class

Property Details

simplify: {Number}

The value of this property is specified as a number of pixels and indicates if and how much the rendering result is to be simplified. If the value is 0, no simplification is applied. Otherwise, the complexity of the rendering result is reduced so that points within a distance smaller than the number of pixels indicated by this property are ignored.

Default Value: 3

Interface: Properties

This interface is a member of ***nokia.maps.map.Spatial***.

Interface Summary

This interface defines the properties (keys) that can be passed to the constructor of all classes derived from *nokia.maps.map.Spatial*.

[*For full details, see nokia.maps.map.Spatial.Properties*]

Table 132: Property Summary

Properties
simplify: {Number} The value of this property is specified as a number of pixels and indicates if and how much the rendering result is to be simplified.

Directly Inherited Properties

Inherited from class *nokia.maps.map.Object.Properties* :

www.EngineeringBooksPdf.com

visibility, *zIndex*

Interface Description

This interface defines the properties (keys) that can be passed to the constructor of all classes derived from `nokia.maps.map.Spatial`.

Property Details

`simplify`: `{Number}`

The value of this property is specified as a number of pixels and indicates if and how much the rendering result is to be simplified. If the value is `0`, no simplification is applied. Otherwise, the complexity of the rendering result is reduced so that points within a distance smaller than the number of pixels indicated by this property are ignored.

Class: StandardMarker

This class is a member of ***`nokia.maps.map`***.

Extends: *nokia.maps.map.Marker*

Class Summary

This class represents a marker with standardized icon.

[*For full details, see nokia.maps.map.StandardMarker*]

Table 133: Property Summary

Properties
`brush`: `{nokia.maps.util.Brush}` This property holds the *nokia.maps.util.Brush* object which defines color of the interior of the shape in which the marker's text label is rendered.
`pen`: `{nokia.maps.util.Pen}` This property holds the *nokia.maps.util.Pen* object which defines color of the outline of the shape in which the marker's text label is rendered.
`shape`: `{String}` This property specifies the shape that is used to display the marker label.
`text`: `{String}` This property holds the text (label) rendered in the center of the shape.

www.EngineeringBooksPdf.com

Properties
textPen: {*nokia.maps.util.Pen*} This property holds the *nokia.maps.util.Pen* object which defines color of the text in the marker's label.

Directly Inherited Properties

Inherited from class *nokia.maps.map.Marker* :

anchor, *coordinate*, *hitArea*, *icon*

Inherited from class *nokia.maps.map.Object* :

CHANGE_SPATIAL, *CHANGE_VISUAL*, *CHANGE_ZINDEX*, *visibility*, *zIndex*

Inherited from class *nokia.maps.dom.EventTarget* :

isDraggable, *isEventTarget*, *parentNode*, *parentNodes*

Inherited from class *nokia.maps.map.provider.IData* :

id

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.Marker* :

getDisplayBoundingBox, *getDisplayOffset*, *getIconForRendering*, *hitTest*

Inherited from class *nokia.maps.map.Object* :

destroy, *getBoundingBox*, *getDisplay*, *getParent*, *getProvider*, *getRoot*, *isVisible*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Inherited from class *nokia.maps.dom.EventTarget* :

addListener, *addListenerNS*, *addListeners*, *disableDrag*, *disableUserSelect*, *dispatch*, *enableDrag*, *enableUserSelect*, *hitTest*, *insertListener*, *insertListenerNS*, *removeAllListeners*, *removeListener*, *removeListenerNS*

Inherited from class *nokia.maps.map.provider.IData* :

getInvalidations

www.EngineeringBooksPdf.com

Event Summary

Directly Inherited Events

Inherited from class *nokia.maps.dom.MouseEventTarget* :

click, *dblclick*, *longpress*, *mousedown*, *mouseenter*, *mouseleave*, *mousemove*, *mouseout*, *mouseover*, *mouseup*, *mousewheel*

Inherited from class *nokia.maps.dom.DragEventTarget* :

drag, *dragend*, *dragenter*, *dragleave*, *dragover*, *dragstart*, *drop*

Inherited from class *nokia.maps.dom.TouchEventTarget* :

dbltap, *gesturechange*, *gestureend*, *gesturestart*, *longpress*, *tap*, *touchend*, *touchmove*, *touchstart*

Class Description

A StandardMarker represents a location on the map and visibly identifies that location with an icon. It is very similar in terms of properties and supported functionality to *nokia.maps.map.Marker*, but in addition, it supports a text label and various text properties for it.

Constructor Details

`nokia.maps.map.StandardMarker``(coord, props)`

This method creates an instance of `StandardMarker`.

Parameters:

`coord`:	{*`nokia.maps.geo.Coordinate`*}
	An object containing the geographical coordinates of the marker
`props`:	{*`nokia.maps.map.StandardMarker.Properties`*} [optional]
	The initial values of marker properties

Property Details

`brush``: {`*`nokia.maps.util.Brush`*`}`

This property holds the *nokia.maps.util.Brush* object which defines color of the interior of the shape in which the marker's text label is rendered. If the property is not set, the original color defined in the specific shape type is used. The default color for "ballon" is #1080DD.

www.EngineeringBooksPdf.com

pen: {*nokia.maps.util.Pen*}

This property holds the *nokia.maps.util.Pen* object which defines color of the outline of the shape in which the marker's text label is rendered. Default stroke color is set to #FFF.

shape: {String}

This property specifies the shape that is used to display the marker label. The following strings can be used right now to set its value:

- "balloon"

There will be more coming soon.

Default Value: `"balloon"`

text: {String}

This property holds the text (label) rendered in the center of the shape. If the rendered text is longer than the screen bounding box of the shape, the text is cropped.

Default Value: `""`

textPen: {*nokia.maps.util.Pen*}

This property holds the *nokia.maps.util.Pen* object which defines color of the text in the marker's label. Default stroke color is #FFF.

Interface: Properties

This interface is a member of ***nokia.maps.map.StandardMarker***.

Interface Summary

This interface defines the properties (keys) that can be passed to the *nokia.maps.map.StandardMarker* constructor.

[*For full details, see nokia.maps.map.StandardMarker.Properties*]

www.EngineeringBooksPdf.com

Table 134: Property Summary

Properties
brush: {*nokia.maps.util.IBrush*} This property define the *nokia.maps.util.IBrush* object which color property is used for the interior of the shape in which the marker's text label is rendered.
pen: {*nokia.maps.util.IPen*} This property define the *nokia.maps.util.IPen* object which stroke color is used for the outline of the shape in which the marker's text label is rendered.
shape: {String} This property specifies the shape that is used to display the marker label.
style: {Object} The property specifies the css style which will be applied to zoom rectangle.
text: {String} This property define the text (label) rendered in the center of the shape.
textPen: {*nokia.maps.util.IPen*} This property define the *nokia.maps.util.IPen* object which stroke color is used for the text in the marker's label.

Directly Inherited Properties

Inherited from class *nokia.maps.map.Marker.Properties* :

anchor, *draggable*, *hitArea*, *icon*

Inherited from class *nokia.maps.map.Object.Properties* :

visibility, *zIndex*

Interface Description

This interface defines the properties (keys) that can be passed to the *nokia.maps.map.StandardMarker* constructor.

Property Details

brush: {*nokia.maps.util.IBrush*}

This property define the *nokia.maps.util.IBrush* object which color property is used for the interior of the shape in which the marker's text label is rendered. If the property is not set, the original color defined in the specific shape type is used. The default color for "ballon" is #1080DD.

www.EngineeringBooksPdf.com

pen: {*nokia.maps.util.IPen*}

This property define the *nokia.maps.util.IPen* object which stroke color is used for the outline of the shape in which the marker's text label is rendered. Default stroke color is set to #FFF.

shape: {String}

This property specifies the shape that is used to display the marker label. The following strings can be used right now to set its value:

- "balloon"

There will be more coming soon.

style: {Object}

The property specifies the css style which will be applied to zoom rectangle. Allowed style properties are:

- border
- background
- opacity

Example:

```
border: "1px solid #F00",
                background: "#0F0",
                opacity: 0.5
            }
```

text: {String}

This property define the text (label) rendered in the center of the shape. If the rendered text is longer than the screen bounding box of the shape, the text is cropped.

textPen: {*nokia.maps.util.IPen*}

This property define the *nokia.maps.util.IPen* object which stroke color is used for the text in the marker's label. Default stroke color is #FFF.

www.EngineeringBooksPdf.com

Namespace: component

This namespace is a member of ***nokia.maps.map***.

Namespace Summary

This namespace provides UI components that can be added to a map display and others that support various types of interactive behavior such as right-mouse click, draggability, mouse gestures, etc.

Namespace Description

This namespace provides UI components that can be added to a map display and others that support various types of interactive behavior such as right-mouse click, draggability, mouse gestures, etc.

Class: Behavior

This class is a member of ***nokia.maps.map.component***.

Extends: *nokia.maps.map.component.Component*

Class Summary

This is a meta component that adds common user interface elements to the map.

[*For full details, see nokia.maps.map.component.Behavior*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

www.EngineeringBooksPdf.com

Class Description

`Behavior` is a collection of user interface elements cumulatively responsible for supporting direct user-interaction with the map. `Behavior` adds or removes the following map user interface components:

- *nokia.maps.map.component.zoom.MouseWheel*
- *nokia.maps.map.component.zoom.DoubleClick*
- *nokia.maps.map.component.zoom.DoubleTap*
- *nokia.maps.map.component.zoom.Gesture*
- *nokia.maps.map.component.panning.Drag*
- *nokia.maps.map.component.panning.Kinetic*
- *nokia.maps.map.component.objects.DragMarker*

Constructor Details

`nokia.maps.map.component.Behavior()`

This method initializes an instance of `Behavior`.

Class: Component

This class is a member of ***`nokia.maps.map.component`***.

Extends: *nokia.maps.util.OObject*

Class Summary

This class is a base class for all map components.

[*For full details, see nokia.maps.map.component.Component*]

Table 135: Property Summary

Properties
`mapDisplay`: *{nokia.maps.map.Display}* This property holds a reference to the `map.Display` instance to which the given component belongs.

Table 136: Method Summary

Methods
`attach` `(mapDisplay)`

www.EngineeringBooksPdf.com

Methods
This method will be invoked when the component is attached to a map and is not meant to be called directly.
destroy `()` This method is called from Display when Display is destroyed.
detach `(mapDisplay)` This method will be invoked when the component is detached from a map and is not meant to be called directly
getId `() : {String}` This method retrieves the unique identifier of the component.

Directly Inherited Methods

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

`Component` is an abstract class that serves as basis for defining replaceable software modules that extend the basic map with additional functionality. Components allow API users to:

- include new functionality
- replace existing functionality with a different implementation
- deactivate existing functionality.

A component may fire custom events.

The `Component` class is implemented in several packages outside the map package, for example in routing and search.

Reference counting

The fact that components are replaceable and that they can add or remove other components, creating and potentially disrupting inter-component dependencies, makes a reference counting mechanism necessary. The basic principle is that whenever a component is created its reference count is incremented to indicate that the creator requires it (and holds a reference to it). The count is also incremented when a component already exists, but a new attempt to create it is made - thus, the count goes up, but duplicate components with the same id are not created. An attempt to deleted/ remove a component, causes its reference count to be decremented.

This mechanism prevents not only component duplication, but also the removal of components while other components dependent on them for as long as the dependencies exist. Caution when physically removing components is necessary, because on removal, a component's `detach` callback is called to

www.EngineeringBooksPdf.com

delete its reference to the map `Display`. As a result, the component becomes unusable in an invalid state.

However, this mechanism remains transparent and you, as the API user simply need to call the methods `addComponent()` and `removeComponent` of the map `Display` class to add and remove components, respectively. Here is an example:

```
// If a Kinetic component already exists, addComponent()
// returns it instead of creating a duplicate.
var component = display.addComponent(new
 nokia.maps.map.component.panning.Kinetic());

// If any other component or application part holds a reference
// to the component, this call does not remove the component, but
// decrements the reference counter by one, otherwise it removes
// the component (if the reference counter reached zero).
display.removeComponent(component);

// Another possibility to remove a component is:
display.removeComponent( display.getComponentById("panning.Kinetic") );
```

Property Details

`mapDisplay`: {*`nokia.maps.map.Display`*}

This property holds a reference to the `map.Display` instance to which the given component belongs.

Method Details

`attach``(mapDisplay)`

This method will be invoked when the component is attached to a map and is not meant to be called directly.

Note that a component must not be bound to two instances of `map.Display` at the same time!

Parameters:

`mapDisplay`:	{*`nokia.maps.map.Display`*} A reference to the `map.Display` instance to which the given component is bound.

`destroy``()`

www.EngineeringBooksPdf.com

This method is called from Display when Display is destroyed. It is also intended that you call it when you detach component from Display and do not want to use component instance anymore. It will free all allocated resources.

`detach(mapDisplay)`

This method will be invoked when the component is detached from a map and is not meant to be called directly

Parameters:

`mapDisplay:`	`{`*`nokia.maps.map.Display`*`}` A reference to the `map.Display` instance from which this component is to be removed.

`getId(): {String}`

This method retrieves the unique identifier of the component. The id is guaranteed to be unique, because it is not possible to add two components with the same id to the map.

Returns:

`{String}`	The component identifier

Class: ContextMenu

This class is a member of ***`nokia.maps.map.component`***.

Extends: *nokia.maps.map.component.Component*

Class Summary

This class represents a context menu that is displayed on right-click with the mouse or long-tap in the map.

[*For full details, see nokia.maps.map.component.ContextMenu*]

Table 137: Property Summary

Properties
`static` ***`mapFeedbackHandler`***`:`

www.EngineeringBooksPdf.com

Properties
This static method is the default implementation for "Report a problem" context menu entry.
`static` ***routingHandler***:
This static method is the default implementation of "Routing" context menu section.
`static` ***zoomHandler***:
This static method is the default implementation that provides access to map zoom functionality from the context menu.

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Table 138: Method Summary

Methods
addHandler `(handler)`
This method adds a user-defined handler to the context menu.
removeHandler `(handler)`
This method removes a previously added handler from the context menu.

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This class represents a context menu that is displayed on right-click with the mouse or long-tap in the map. @class The context menu displays a context menu on the map. By default the context menu contains two entries that support zooming the map in and out one level at a time.

The context menu may be extended via handlers. A handler is responsible for a group of menu entries and you can add new entries to the group as required. Each entry consists of a label and an associated callback that implements an action (functionality) specific to the menu entry.

www.EngineeringBooksPdf.com

Constructor Details

nokia.maps.map.component.ContextMenu()

This method initializes a new instance of ContextMenu

Example:

```
var myHandler = function(contextMenuEvent, group) {
    group.addEntry(
        "pan left",
        function(activationEvent) {
            this.mapDisplay.pan(0, 0, -200, 0);
        });
}

var contextMenu = new nokia.maps.map.component.ContextMenu();
contextMenu.addHandler(myHandler);

display.components.add(contextMenu);
```

Property Details

static mapFeedbackHandler:

This static method is the default implementation for "Report a problem" context menu entry. It is added to the ContextMenu at construction time and lazy loads widget when menu is shown for the first time.

static routingHandler:

This static method is the default implementation of "Routing" context menu section. It is added to the ContextMenu at construction time IF routing was loaded.

static zoomHandler:

This static method is the default implementation that provides access to map zoom functionality from the context menu. (*nokia.maps.map.component.ContextMenu.Group#addEntry*) The method can be added as a handler (using *nokia.maps.map.component.ContextMenu#addHandler*) in order to activate the functionality in the context menu.

Method Details

addHandler(handler)

www.EngineeringBooksPdf.com

This method adds a user-defined handler to the context menu. The handler callback is called with the event that activated the context menu and a group that is unique to the handler function. To add group entries, invoke the method addEntry() (*nokia.maps.map.component.ContextMenu.Group#addEntry*).

Parameters:

`handler:` `{Function}`

`removeHandler(handler)`

This method removes a previously added handler from the context menu.

Parameters:

`handler:` `{Function}`

A reference to the handler to remove

Class: Group

This class is a member of ***`nokia.maps.map.component.ContextMenu`***.

Class Summary

This class represents group of entries within the context menu.

[*For full details, see nokia.maps.map.component.ContextMenu.Group*]

Table 139: Method Summary

Methods
`addEntry` `(label, callback)` This method adds an entry to the group.

Class Description

The class `ContextMenu.Group` represents an abstract group of entries within the context menu. Each handler function that is registered on the context menu is associated with a specific group object to which it can add entries.

If a handler does not to add entries to its group, it is not included in the context menu.

www.EngineeringBooksPdf.com

Constructor Details

`nokia.maps.map.component.ContextMenu.Group()`

This method initializes a new instance of `ContextMenu.Group`. This constructor is invoked by the context menu and a fully initialized `Group` instance is passed to each handler registered on the context menu.

Method Details

`addEntry(label, callback)`

This method adds an entry to the group. An entry consists of a label and an optional callback function to be invoked upon activation of the entry. The label can be a String (for a static label) or a callback function which receives the corresponding DOM node.

Parameters:

`label`:	`{String | Function}`
	The label of the entry, or a callback function to be invoked when the node for this entry is created
`callback`:	`{Function}` [optional]
	A callback function to be invoked when the entry is activated

Example:

```
 //adding an entry with a static text label and an activation callback
group.addEntry("my label", function(activationEvent) {
   //activation call back code
});
//adding an entry with a label callback and an activation callback
group.addEntry(
   function(domNode) {
      //add label dynamically
   },
   function(activationEvent) {
      //activation call back code
   }
);
```

Class: DistanceMeasurement

This class is a member of ***`nokia.maps.map.component`***.

www.EngineeringBooksPdf.com

Extends: *nokia.maps.map.component.Component*

Class Summary

This component helps calculate distances between geographical locations indicated by user clicks.

[*For full details, see nokia.maps.map.component.DistanceMeasurement*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Table 140: Method Summary

Methods
formatLength `(length) : {Number | String}` This method obtains the formated distance that can be use in distance labels.

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

`DistanceMeasurement` adds direct user-interaction to the map. The user can click on the map to specify locations and build a path whose length is measured. The locations are indicated by markers and the path by lines connecting the markers.

A marker that has been added to the map in this way can be removed by holding down the CTRL key and clicking on the marker. The user can also split the line connecting two markers and create a new marker by dragging the line or clicking on the line between markers

Constructor Details

`nokia.maps.map.component.DistanceMeasurement``(props)`

www.EngineeringBooksPdf.com

This method creates a `DistanceMeasurement` tool component which can be added to a map display.

Parameters:

`props`:	{*`nokia.maps.map.component.DistanceMeasurement.Properties`*} [optional] An object which can contain properties and/or methods which should be appended to instances of this class; the object can be used to extend the component.

Method Details

`formatLength``(length): {Number | String}`

This method obtains the formated distance that can be use in distance labels. (The method is called to format distance labels). This method should be rewritten in derived classes, for example, if there is a requirement to round numbers and to use different system of measurement.

Parameters:

`length`:	`{Number}` A value indicating the distance in meters

Returns:

`{Number | String}`	A numeric value or string representing the formated distance

Interface: Properties

This interface is a member of ***`nokia.maps.map.component.DistanceMeasurement`***.

Interface Summary

This interface defines the properties (keys) that can be passed to the map *`nokia.maps.map.component.DistanceMeasurement`* constructor.

[*For full details, see nokia.maps.map.component.DistanceMeasurement.Properties*]

www.EngineeringBooksPdf.com

Table 141: Property Summary

Properties
endMarkerOptions: {*nokia.maps.map.Marker.Properties*} This property holds options like icon or anchor for last marker.
hoverPen: {*nokia.maps.util.IPen*} This property holds pen for polyline connecting two markers which is highlighted when mouse pointer is above this line.
middleMarkerOptions: {*nokia.maps.map.Marker.Properties*} This property holds options like icon or anchor for middle markers.
normalPen: {*nokia.maps.util.IPen*} This property holds pen for polyline connecting two markers.
startMarkerOptions: {*nokia.maps.map.Marker.Properties*} This property holds options like icon or anchor for first marker.
textLabelOnFirstMarker: {Boolean} This property defines if text label is also displayed for first marker (true) or not (false).

Interface Description

This interface defines the properties (keys) that can be passed to the map *nokia.maps.map.component.DistanceMeasurement* constructor.

Property Details

endMarkerOptions: {*nokia.maps.map.Marker.Properties*}

This property holds options like icon or anchor for last marker.

hoverPen: {*nokia.maps.util.IPen*}

This property holds pen for polyline connecting two markers which is highlighted when mouse pointer is above this line.

middleMarkerOptions: {*nokia.maps.map.Marker.Properties*}

This property holds options like icon or anchor for middle markers.

www.EngineeringBooksPdf.com

normalPen: {*nokia.maps.util.IPen*}

This property holds pen for polyline connecting two markers.

startMarkerOptions: {*nokia.maps.map.Marker.Properties*}

This property holds options like icon or anchor for first marker.

textLabelOnFirstMarker: {Boolean}

This property defines if text label is also displayed for first marker (true) or not (false).

Class: InfoBubbles

This class is a member of ***nokia.maps.map.component***.

Extends: *nokia.maps.map.component.Component*

Class Summary

This component manages visibility of info bubbles on the map.

[*For full details, see nokia.maps.map.component.InfoBubbles*]

Table 142: Property Summary

Properties
readonly ***ALIGNMENT_ABOVE***: {String} This identifier specifies a vertical alignment above the bubble's anchor.
readonly ***ALIGNMENT_BELOW***: {String} This identifier specifies a vertical alignment below the bubble's anchor.
readonly ***ALIGNMENT_LEFT***: {String} This identifier specifies a horizontal alignment to the left of the bubble's anchor.
readonly ***ALIGNMENT_RIGHT***: {String} This identifier specifies a horizontal alignment to the right of the bubble's anchor.
readonly ***DIMENSION_AUTO***: {String} This identifier specifies a width or height which is automatically determined.
readonly ***openBubbleHandles***: {*nokia.maps.util.OList*}

www.EngineeringBooksPdf.com

Properties
This property holds an observable list of handles to open bubbles.
options: {*nokia.maps.map.component.InfoBubbles.Options*} This property holds an observable object that allows for modification of the presentation options on all newly created bubbles that are displayed via the given component.

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Table 143: Method Summary

Methods
closeBubble (bubble) This method closes the bubble that is passed as a parameter.
initBubble (onUserClose, hideCloseButton) : {*nokia.maps.map.component.InfoBubbles.Bubble*} This method creates a new empty info bubble.
openBubble (content, coordinate, onUserClose, hideCloseButton) : {*nokia.maps.map.component.InfoBubbles.Bubble*} This method creates a new info bubble, updates it with content and shows it on the map.

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

If added to the map, this component manages info bubbles. The component is responsible for adding and removing info bubbles. Each info bubble must have an instance of *nokia.maps.geo.Coordinate* and its contents is a string object.

This info bubbles components supports single or multiple info bubbles (see *nokia.maps.map.component.InfoBubbles#options*).

www.EngineeringBooksPdf.com

Constructor Details

nokia.maps.map.component.InfoBubbles()

This method initializes an instance of `nokia.maps.map.component.InfoBubbles` which can be added to a map `Display`.

Property Details

`readonly` **ALIGNMENT_ABOVE**: {String}

This identifier specifies a vertical alignment above the bubble's anchor.

`readonly` **ALIGNMENT_BELOW**: {String}

This identifier specifies a vertical alignment below the bubble's anchor.

`readonly` **ALIGNMENT_LEFT**: {String}

This identifier specifies a horizontal alignment to the left of the bubble's anchor.

`readonly` **ALIGNMENT_RIGHT**: {String}

This identifier specifies a horizontal alignment to the right of the bubble's anchor.

`readonly` **DIMENSION_AUTO**: {String}

This identifier specifies a width or height which is automatically determined.

`readonly` **openBubbleHandles**: {*nokia.maps.util.OList*}

This property holds an observable list of handles to open bubbles. When a bubble is shown, the respective handle is added to this list. When a bubble is closed, its handle is removed from this list.

options: {*nokia.maps.map.component.InfoBubbles.Options*}

This property holds an observable object that allows for modification of the presentation options on all newly created bubbles that are displayed via the given component.

www.EngineeringBooksPdf.com

Use `nokia.maps.util.OObject.set()` to set properties on this object to make sure changes are propagated correctly to the system.

Example:

```
var infoBubbles = new nokia.maps.map.component.InfoBubbles();
//map is an instance of nokia.maps.map.Display
map.components.add(infoBubbles);

// causes all subsequently created bubbles to open left of their anchor
// (unless there's not enough space on that side)
infoBubbles.options.set("defaultXAlignment", infoBubbles.ALIGNMENT_LEFT);
infoBubbles.openBubble("myInfoBubble", map.center);
```

Method Details

`closeBubble(bubble)`

This method closes the bubble that is passed as a parameter.

Parameters:

`bubble`:	{*nokia.maps.map.component.InfoBubbles.Bubble*} A handle to the info bubble

`initBubble(onUserClose, hideCloseButton)`: {*nokia.maps.map.component.InfoBubbles.Bubble*}

This method creates a new empty info bubble.

Note that you should use *nokia.maps.map.component.InfoBubbles#openBubble* if you do not want to *nokia.maps.map.component.InfoBubbles.Bubble#update* and *nokia.maps.map.component.InfoBubbles.Bubble#open* it by manually. This method is useful if you want to preload some content into bubble before showing it.

Parameters:

`onUserClose`:	{`Function`} [optional] A callback method which is called when user closes the bubble (by clicking on close button) to be placed.
`hideCloseButton`:	{`Boolean`} [optional]

www.EngineeringBooksPdf.com

Hides close button if set to true.

Returns:

{*nokia.maps.map.component.InfoBubbles.Bubble*}

The handle of this bubble

openBubble(content, coordinate, onUserClose, hideCloseButton): {*nokia.maps.map.component.InfoBubbles.Bubble*}

This method creates a new info bubble, updates it with content and shows it on the map.

Parameters:

content: {String | DomElement}

The content to be shown in the info bubble; it can be an HTML string, please note that Flash content in the bubble overlap other elements in the document

coordinate: {*nokia.maps.geo.Coordinate*}

An object containing the geographic coordinates of the location, where the bubble's anchor is to be placed.

onUserClose: {Function} [optional]

A callback method which is called when user closes the bubble (by clicking on close button) to be placed.

hideCloseButton: {Boolean} [optional]

Hides close button if set to true.

Returns:

{*nokia.maps.map.component.InfoBubbles.Bubble*}

The handle of this bubble

Interface: Bubble

This interface is a member of ***nokia.maps.map.component.InfoBubbles***.

www.EngineeringBooksPdf.com

Interface Summary

This interface defines a bubble which is shown on the map by an instance of *nokia.maps.map.component.InfoBubbles*.

[*For full details, see nokia.maps.map.component.InfoBubbles.Bubble*]

Table 144: Property Summary

Properties
contentNode: {DomElement} This property holds the reference to the DOM node with the content of the bubble.
coordinate: {*nokia.maps.geo.Coordinate*} This property holds the object containing the geographic coordinates of the given info bubble.
node: {DomElement} This property holds the reference to the DOM node that of the bubble itself and all its contents.
xAlignment: {String} This property defines the actual current horizontal alignment of the info bubble.
yAlignment: {String} This property defines the actual current vertical alignment of the info bubble.

Table 145: Method Summary

Methods
close () This method closes a bubble and removes it from the map.
getState () : {String} This method returns current state of the bubble: • "initialized" for the bubble that is initialized (by *nokia.maps.map.component.InfoBubbles#initBubble*), but not opened yet • "opened" for the bubble that is opened (by *nokia.maps.map.component.InfoBubbles#openBubble* or *nokia.maps.map.component.InfoBubbles.Bubble#open*) • "closed" for the bubble that is closed (by *nokia.maps.map.component.InfoBubbles#closeBubble* or *nokia.maps.map.component.InfoBubbles.Bubble#close*)
isVisible () : {Boolean} This method returns true if the bubble is fully or partially visible on the screen, and false if the bubble is fully hidden.
open (coordinate)

www.EngineeringBooksPdf.com

Methods
This method opens a previously initialized bubble on the map.
update `(content, coordinate)` This method updates a bubble with new content and/or coordinates.

Interface Description

This interface defines a bubble which is shown on the map by an instance of *`nokia.maps.map.component.InfoBubbles`*.

Property Details

`contentNode`: `{DomElement}`

This property holds the reference to the DOM node with the content of the bubble.

`coordinate`: `{`*`nokia.maps.geo.Coordinate`*`}`

This property holds the object containing the geographic coordinates of the given info bubble.

`node`: `{DomElement}`

This property holds the reference to the DOM node that of the bubble itself and all its contents. It is possible to check this node offsetWidth or offsetHeight properties to get size of bubble.

`xAlignment`: `{String}`

This property defines the actual current horizontal alignment of the info bubble.

`yAlignment`: `{String}`

This property defines the actual current vertical alignment of the info bubble.

Method Details

`close``()`

This method closes a bubble and removes it from the map.

www.EngineeringBooksPdf.com

`getState(): {String}`

This method returns current state of the bubble:

- "initialized" for the bubble that is initialized (by *nokia.maps.map.component.InfoBubbles#initBubble*), but not opened yet
- "opened" for the bubble that is opened (by *nokia.maps.map.component.InfoBubbles#openBubble* or *nokia.maps.map.component.InfoBubbles.Bubble#open*)
- "closed" for the bubble that is closed (by *nokia.maps.map.component.InfoBubbles#closeBubble* or *nokia.maps.map.component.InfoBubbles.Bubble#close*)

Returns:

`{String}`	One of the three possible states of the bubble: "initialized", "opened" or "closed"

`isVisible(): {Boolean}`

This method returns true if the bubble is fully or partially visible on the screen, and false if the bubble is fully hidden.

Returns:

`{Boolean}`	A flag indicating whether the bubble is visible or fully hidden.

`open(coordinate)`

This method opens a previously initialized bubble on the map.

Parameters:

`coordinate:`	{*`nokia.maps.geo.Coordinate`*} [optional] An object containing the geographic coordinates of the location, where the bubble's anchor is to be placed. It is not necessary specify coordinate if co-ordinatate was set by update method.

`update(content, coordinate)`

www.EngineeringBooksPdf.com

This method updates a bubble with new content and/or coordinates. Both of parameters are optional, call without them can be used for forced update of bubble's size and alignment.

Parameters:

`content`:	`{String | DomElement}` [optional] The content to be shown in the info bubble provided as an HTML string; note that flash content in the bubble can lead to the effect that the flash content overlaps other elements in the document
`coordinate`:	{*`nokia.maps.geo.Coordinate`*} [optional] An object containing the geographic coordinates of the location, where the anchor is to be placed

Interface: Options

This interface is a member of ***`nokia.maps.map.component.InfoBubbles`***.

Extends: *nokia.maps.util.OObject*

Interface Summary

This interface defines the properties (options or keys) for *`nokia.maps.map.component.InfoBubbles#options`* property.

[*For full details, see nokia.maps.map.component.InfoBubbles.Options*]

Table 146: Property Summary

Properties
`autoClose``: {Boolean}` This property specifies whether the info bubbles component allows to have only one or multiple bubbles open at the same time.
`backgroundColor``: {String}` This property specifies the background color of info bubbles.
`color``: {String}` This property specifies the foreground color (text color) of info bubbles.
`defaultHeight``: {String | Number}` This property holds the preferred height of bubbles.
`defaultWidth``: {String | Number}`

www.EngineeringBooksPdf.com

Properties
This property holds the preferred width of bubbles.
defaultXAlignment: {String} This property holds the preferred horizontal alignment of bubbles.
defaultYAlignment: {String} This property holds the preferred vertical alignment of bubbles.

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Interface Description

This interface defines the properties (options or keys) for *nokia.maps.map.component.InfoBubbles#options* property.

Property Details

autoClose: {Boolean}

This property specifies whether the info bubbles component allows to have only one or multiple bubbles open at the same time.

When this property is set to true the component will automatically close all bubbles when a new bubble is opened. When this property is set to false bubbles will not be closed.

Changes to this property will take effect only when a new info bubble is opened.

Default Value: `true`

backgroundColor: {String}

This property specifies the background color of info bubbles. Any bubble that is opened after setting this property will have the specified background color. The property accepts colors as strings in hexadecimal notation or rgb(a) notation.

Note: Setting this property has an effect only after the component was added to a display's component collection.

www.EngineeringBooksPdf.com

color: {String}

This property specifies the foreground color (text color) of info bubbles. Any bubble that is opened after setting this property will have the specified foreground color. The property accepts colors as strings in hexadecimal notation or rgb(a) notation.

Note: Setting this property has an effect only after the component was added to a display's component collection.

defaultHeight: {String | Number}

This property holds the preferred height of bubbles. The property can either have a numeric value defining the height of bubbles in pixels or its value can be the string constant "auto" (*nokia.maps.map.component.InfoBubbles#DIMENSION_AUTO*) to allow the bubble to manage its size on its own. The default value is "auto".

Should very large amounts of text are displayed in an info bubble, it is best to set the preferred width to a fixed size to avoid rendering artifacts.

Platform-dependent styling can also be applied to the value of this property as a string, but the result of this may not yield expected results.

defaultWidth: {String | Number}

This property holds the preferred width of bubbles. The property can either have a numeric value defining the width of bubbles in pixels or it can be the string constant "auto" (*nokia.maps.map.component.InfoBubbles#DIMENSION_AUTO*) to allow the bubble to manage its size on its own. The default value is "auto".

Should very large amounts of text are displayed in an info bubble, it is best to set the preferred width to a fixed size to avoid rendering artifacts.

Platform-dependent styling can also be applied to the value of this property as a string, but the result of this may not yield expected results.

defaultXAlignment: {String}

This property holds the preferred horizontal alignment of bubbles. The property can have one of the following three values:

- `left` (*nokia.maps.map.component.InfoBubbles#ALIGNMENT_LEFT*)

www.EngineeringBooksPdf.com

- `right` (*nokia.maps.map.component.InfoBubbles#ALIGNMENT_RIGHT*)

The default value is `right`.

`defaultYAlignment`: `{String}`

This property holds the preferred vertical alignment of bubbles. The property can have one of the following three values:

- `above` (*nokia.maps.map.component.InfoBubbles#ALIGNMENT_ABOVE*)
- `below` (*nokia.maps.map.component.InfoBubbles#ALIGNMENT_BELOW*)

The default value is `below`.

Class: KeyControl

This class is a member of ***`nokia.maps.map.component`***.

Extends: *nokia.maps.map.component.Component*

Class Summary

This class adds keyboard control to the map.

[*For full details, see nokia.maps.map.component.KeyControl*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

www.EngineeringBooksPdf.com

Class Description

This class adds keyboard control to the map. In 2D and 3D map mode the arrow keys pan the map. Additionally, tilt and heading can be modified in 3D mode by holding SHIFT key and using the arrow keys. In Panorama mode the arrow keys change the view angle. The + and - keys adjust the zoom in all modes.

Constructor Details

`nokia.maps.map.component.KeyControl()`

This method initializes a new instance of `KeyControl`.

Class: OverlaysSelector

This class is a member of ***`nokia.maps.map.component`***.

Extends: *nokia.maps.map.component.Component*

Class Summary

This component allows the user to select predefined overlays.

[*For full details, see nokia.maps.map.component.OverlaysSelector*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Table 147: Method Summary

Methods
`showOverlayButtons` `(btnNames, show)` This method shows or hides buttons for specific overlays.

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

www.EngineeringBooksPdf.com

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

`OverlaysSelector` is a component that supports activation and deactivation of map overlay buttons. These buttons allow the user to switch additional overlay layers on and off.

Constructor Details

`nokia.maps.map.component.OverlaysSelector``(overlays, props)`

This method initializes an instance of `OverlaysSelector`.

Parameters:

`overlays`:	`{String[]}` [optional] An array of overlay buttons that are to be shown by this component; it determines which buttons appear on the map and thus which layers can be (de)activated by the user; the possible values are: "trafficflow", "trafficincidents" (not available on all platforms); if this optional parameter is omitted, all available buttons are shown
`props`:	`{Object}` [optional] An object which can contain properties and/or methods to be appended to instances of this class; it can be used to extend a component

Method Details

`showOverlayButtons``(btnNames, show)`

This method shows or hides buttons for specific overlays. Note that overriding methods have to call this super method as follows:

Parameters:

`btnNames`:	`{String[]}` [optional] An array of strings containing the names of all the buttons to be shown or or hidden
`show`:	`{Boolean}` [optional]

www.EngineeringBooksPdf.com

A value indicating if the named buttons are to be shown (`true` - default) or hidden (`false`)

Example:

```
nokia.maps.map.component.OverlaysSelector.prototype.showOverlayButtons.apply(this,
arguments);
```

Interface: Properties

This interface is a member of ***nokia.maps.map.component.OverlaysSelector***.

Interface Summary

This interface defines the properties (keys) that can be passed to the *nokia.maps.map.component.OverlaysSelector* constructor.

[*For full details, see nokia.maps.map.component.OverlaysSelector.Properties*]

Table 148: Property Summary

Properties
disableTooltips: {Boolean} Property disables tooltips that appear when traffic incident marker is clicked on the map.

Interface Description

This interface defines the properties (keys) that can be passed to the *nokia.maps.map.component.OverlaysSelector* constructor.

Property Details

disableTooltips: {Boolean}

Property disables tooltips that appear when traffic incident marker is clicked on the map.

Class: Overview

This class is a member of ***nokia.maps.map.component***.

Extends: *nokia.maps.map.component.Component*

www.EngineeringBooksPdf.com

Class Summary

This component shows small overview map.

[*For full details, see nokia.maps.map.component.Overview*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Table 149: Method Summary

Methods
getMinimapDimensions `() : {Object}` This method retrieves the defined dimensions (width and height) of the map overview panel.
showMap `(node)` This method shows a mini map display instance in the DOM node provided by the caller.

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Table 150: Event Summary

Events
resize The identifier for an event that is fired for each step of the resize animation.
resizeend The identifier for an event that is fired when the mini map resizing animation ends.
resizestart The identifier for an event that is fired when the mini map resizing animation starts.

www.EngineeringBooksPdf.com

Class Description

This class defines a panel showing an overview of the map visible viewport.

Constructor Details

`nokia.maps.map.component.Overview(props)`

This method creates a panel showing an overview of the map.

Parameters:

`props`:	`{Object}` [optional] An object that can contain properties / methods to be appended to instances of this class; the argument can be used to extend a component.

Method Details

`getMinimapDimensions(): {Object}`

This method retrieves the defined dimensions (width and height) of the map overview panel. NOTE: Override this method to define the width / height of the mini map.

Returns:

`{Object}`	The dimensions of the map as an object with the following properties: • `width` - the width of the overview panel in pixels • `height` - the height of the overview panel in pixels

`showMap(node)`

This method shows a mini map display instance in the DOM node provided by the caller.

Parameters:

`node`:	`{DomElement}` A reference to the DOM node in which to show the mini map

Event Details

`resize`

www.EngineeringBooksPdf.com

The identifier for an event that is fired for each step of the resize animation.

Event Handler Parameters:

`nokia.maps.dom.Event`

`resizeend`

The identifier for an event that is fired when the mini map resizing animation ends.

Event Handler Parameters:

`nokia.maps.dom.Event`

`resizestart`

The identifier for an event that is fired when the mini map resizing animation starts.

Event Handler Parameters:

`nokia.maps.dom.Event`

Class: PublicTransport

This class is a member of ***`nokia.maps.map.component`***.

Extends: *nokia.maps.map.component.Component*

Class Summary

The class `PublicTransport` defines a component that allows the user to turn on/off the public transportation overlay.

[*For full details, see nokia.maps.map.component.PublicTransport*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

www.EngineeringBooksPdf.com

mapDisplay

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

The class `PublicTransport` defines a component that allows the user to turn on/off the public transportation overlay.

Constructor Details

`nokia.maps.map.component.PublicTransport()`

Initializes a new instance of `PublicTransport`

Class: ScaleBar

This class is a member of ***`nokia.maps.map.component`***.

Extends: *nokia.maps.map.component.Component*

Class Summary

This components shows a scale bar.

[*For full details, see nokia.maps.map.component.ScaleBar*]

Table 151: Property Summary

Properties
`showImperialUnits``: {Boolean}` This property indicates whether imperial rather than metric units of measurements are to be used.

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

www.EngineeringBooksPdf.com

mapDisplay

Table 152: Method Summary

Methods
calculateMPP `() : {Number}` This method calculates a value representing how many meters correspond to each pixel in the map view.
switchUnit `()` This method toggles the measurement units, in which the distance is displayed.
updateScale `()` This method is called, when the scale of the map view was changed.

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This component defines a panel that holds the scale bar. The scale bar is a ruler showing map distances relative to the current zoom level of the map. The measurement type can be changed from metric to imperial, which will be reflected in the distance measurements.

Constructor Details

`nokia.maps.map.component.ScaleBar()`

This method initializes a new instance of `ScaleBar`

Property Details

`showImperialUnits``: {Boolean}`

This property indicates whether imperial rather than metric units of measurements are to be used. `true` indicates imperial units, `false` indicates metric units.

www.EngineeringBooksPdf.com

Method Details

`calculateMPP(): {Number}`

This method calculates a value representing how many meters correspond to each pixel in the map view.

Returns:

`{Number}`	A value indicating how many meters correspond to each pixel in the map view.

`switchUnit()`

This method toggles the measurement units, in which the distance is displayed.

`updateScale()`

This method is called, when the scale of the map view was changed. It updates the map component to reflect these changes.

Class: Traffic

This class is a member of ***`nokia.maps.map.component`***.

Extends: *nokia.maps.map.component.Component*

Class Summary

The class `Traffic` defines a component that allows the user to turn on/off the traffic overlay.

[*For full details, see nokia.maps.map.component.Traffic*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Method Summary

Directly Inherited Methods

www.EngineeringBooksPdf.com

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

The class `Traffic` defines a component that allows the user to turn on/off the traffic overlay.

Constructor Details

`nokia.maps.map.component.Traffic()`

This method initializes a new instance of `Traffic`.

Class: TypeSelector

This class is a member of ***`nokia.maps.map.component`***.

Extends: *nokia.maps.map.component.Component*

Class Summary

This component allows user to select one of base map types.

[*For full details, see nokia.maps.map.component.TypeSelector*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

www.EngineeringBooksPdf.com

Class Description

This class defines a user interface component that allows the user to change the current base map type. Note that the component might not show all of the available base map types. Please check *nokia.maps.map.Display#availableBaseMapTypes* to see the complete list of map types.

To instantiate this class, use the default constructor without arguments:

```
var myTypeSelector = new nokia.maps.map.component.TypeSelector();
```

Constructor Details

`nokia.maps.map.component.TypeSelector()`

This method initializes a new instance of `TypeSelector`.

Class: ViewControl

This class is a member of ***`nokia.maps.map.component`***.

Extends: *nokia.maps.map.component.Component*

Class Summary

This class enables user to manipulate map, like changing heading tilt and center of the map.

[*For full details, see nokia.maps.map.component.ViewControl*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Table 153: Method Summary

Methods
`updateHeading` `()` This method is called when the map heading (bearing) changes.
`updateTilting` `()` This method is called when the map tilt changes.

Directly Inherited Methods

www.EngineeringBooksPdf.com

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

The class `ViewControl` defines a panel that provides controls for heading (bearing), tilt and pan (setting the center position). The heading/tilt/pan component controls the displayed map orientation, i.e. North, South, East, West, and the angle map tilt.

Note that the heading/tilt/pan panel is only available in the Web version of the API. In device scenarios, adding this component has no effect.

Constructor Details

`nokia.maps.map.component.ViewControl``(props)`

This method initializes an instance of `ViewControl` using the properties supplied by the caller.

Parameters:

`props`:	`{Object}` [optional]
	an object which can contain properties / methods to be appended to instances of this class; the object extends the component.

Method Details

`updateHeading``()`

This method is called when the map heading (bearing) changes. It updates the map component to reflect these changes.

`updateTilting``()`

This method is called when the map tilt changes. It updates the the map component to reflect these changes.

Class: ZoomBar

This class is a member of ***`nokia.maps.map.component`***.

www.EngineeringBooksPdf.com

Extends: *nokia.maps.map.component.Component*

Class Summary

This component enables zoom in and out buttons.

[*For full details, see nokia.maps.map.component.ZoomBar*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

The class `ZoomBar` defines a component that allows the user to control the zoom level of the map. In the basic version, the zoom bar consists of two buttons (labeled "+" and "-") that permit the map user to change the zoom level.

To instantiate this class, use the default constructor without arguments:

```
var myZoomBar = new nokia.maps.map.component.ZoomBar();
```

Constructor Details

`nokia.maps.map.component.ZoomBar()`

This method initializes a new instance of `ZoomBar`.

Class: ZoomRectangle

This class is a member of ***`nokia.maps.map.component`***.

www.EngineeringBooksPdf.com

Extends: *nokia.maps.map.component.Component*

Class Summary

This component adds zoom rectangle functionality to the map.

[*For full details, see nokia.maps.map.component.ZoomRectangle*]

Table 154: Property Summary

Properties
on: {Boolean} This property holds a value indicating if the zoom rectangle mode is currently activated (`true`) or not (`false`).
rectNode: {DomElement} This property holds a reference to rectangle DOM element used for the zoom rectangle selection.

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Table 155: Method Summary

Methods
static ***switchOnOff*** () This method toggles the zoom rectangle functionality.

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This map component adds zoom rectangle functionality. When the component is activated, the user can zoom into an area by dragging a rectangle on the map.

www.EngineeringBooksPdf.com

Constructor Details

nokia.maps.map.component.ZoomRectangle(props)

This method initializes a new instance of ZoomRectangle.

Parameters:

props:	{Object} [optional]
	optional initialization parameters

Property Details

on: {Boolean}

This property holds a value indicating if the zoom rectangle mode is currently activated (true) or not (false).

rectNode: {DomElement}

This property holds a reference to rectangle DOM element used for the zoom rectangle selection. By default, the element is a with a border: "2px solid black", unless otherwise specified.

Method Details

static **switchOnOff**()

This method toggles the zoom rectangle functionality.

Interface: Properties

This interface is a member of ***nokia.maps.map.component.ZoomRectangle***.

Interface Summary

This interface defines the properties (keys) that can be passed to the *nokia.maps.map.component.ZoomRectangle* constructor.

[*For full details, see nokia.maps.map.component.ZoomRectangle.Properties*]

Interface Description

This interface defines the properties (keys) that can be passed to the *nokia.maps.map.component.ZoomRectangle* constructor.

www.EngineeringBooksPdf.com

Namespace: objects

This namespace is a member of ***nokia.maps.map.component***.

Namespace Summary

This namespace implements draggable behavior for map markers.

Namespace Description

This namespace implements draggable behavior for map markers.

Class: DragMarker

This class is a member of ***nokia.maps.map.component.objects***.

Extends: *nokia.maps.map.component.Component*

Class Summary

This component allows markers to be draggable.

[*For full details, see nokia.maps.map.component.objects.DragMarker*]

Table 156: Property Summary

Properties
enabled: {Boolean} This Boolean property is set to `true` if the component is enabled, `false` otherwise.

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

www.EngineeringBooksPdf.com

Class Description

This component implements the default draggability for markers. If this component is added to the map, all markers and standard markers on which the property "isDraggable" is set to `true` can be dragged by the user.

Constructor Details

`nokia.maps.map.component.objects.DragMarker`

This method initializes an instance of `DragMarker`, using the properties supplied by the caller. The method is a virtual constructor for the component.

Parameters:

`props`:	`{Object}`	The default observable key-value pairs for this component (see nokia.maps.util.OObject).

Property Details

`enabled`: `{Boolean}`

This Boolean property is set to `true` if the component is enabled, `false` otherwise.

Namespace: panning

This namespace is a member of ***`nokia.maps.map.component`***.

Namespace Summary

This namespace implements panning functionality, including kinetic panning.

Namespace Description

This namespace implements panning functionality, including kinetic panning. It makes panning possible when the use clicks on the map or drags it.

Class: Click

This class is a member of ***`nokia.maps.map.component.panning`***.

Extends: *nokia.maps.map.component.Component*

www.EngineeringBooksPdf.com

Class Summary

This component pans the map when the user clicks in the map.

[*For full details, see nokia.maps.map.component.panning.Click*]

Table 157: Property Summary

Properties
enabled: {Boolean} This property determines if Click is enabled (true) or not (false).

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This component pans the map when the user clicks in the map.

Constructor Details

nokia.maps.map.component.panning.Click(props)

This method initializes an instance of Click, using the properties supplied by the caller. The method is a virtual constructor for the component.

Parameters:

props:	{Object} The default observable key-value pairs for this component (see nokia.maps.util.OObject).

www.EngineeringBooksPdf.com

Property Details

`enabled`: `{Boolean}`

This property determines if `Click` is enabled (`true`) or not (`false`).

Class: Drag

This class is a member of ***`nokia.maps.map.component.panning`***.

Extends: *nokia.maps.map.component.Component*

Class Summary

This component enables map dragging with the left mouse button or with the finger on a touch screen.

[*For full details, see nokia.maps.map.component.panning.Drag*]

Table 158: Property Summary

Properties
`enabled`: `{Boolean}` This property indicates if the drag component is enabled.
`useKineticPanning`: `{Boolean}` This property indicates whether the drag component uses kinetic panning if it is available.

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

www.EngineeringBooksPdf.com

Class Description

This component enables map dragging with the left mouse button or with the finger on a touch screen.

Constructor Details

`nokia.maps.map.component.panning.Drag``(props)`

This method initializes an instance of `Drag`, using the properties supplied by the caller. The method is a virtual constructor for the component.

Parameters:

`props`:	`{Object}`
	The default observable key-value pairs for this component (see nokia.maps.util.OObject).

Property Details

`enabled``: {Boolean}`

This property indicates if the drag component is enabled. The value is `true` if the component is enabled, `false` otherwise.

`useKineticPanning``: {Boolean}`

This property indicates whether the drag component uses kinetic panning if it is available. The value is `true` if kinetic panning is used, `false` otherwise.

Class: Kinetic

This class is a member of ***`nokia.maps.map.component.panning`***.

Extends: *nokia.maps.map.component.Component*

Class Summary

This component enables kinetic panning functionality on the map.

[*For full details, see nokia.maps.map.component.panning.Kinetic*]

www.EngineeringBooksPdf.com

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This component adds kinetic panning functionality to the map display. If it is added to a display, other components in the `panning` namespace are able automatically to detect it and use kinetic panning. These components include `panning.Click`, `panning.Tap` and `panning.Drag`.

Kinetic panning consists of two pahses: move and slide. During the first phase, map movements and their timing are recorded so that the kinetic panning module can determine how fast (pixels per second) and in which direction the map moves. The sliding phase begins when the moving map is released. The map then continues to move in the same direction at a gradually diminishing speed (as if friction were slowing it down), until it comes to a halt.

Kinetic panning from other components can be used as an alternative, but not at the same time as this component: `nokia.maps.map.component.panning.Kinetic` implements mechanisms to ensure that only one kinetic panning is performed at a time. The example below demonstrates how a kinetic panning is implemented:

```
// Query for the kinetic component.
var kineticComponent = display.getComponentById("panning.Kinetic");

// Initialize the kinetic engine to record a new movement -- this
// starts the movement phase.
var kineticMovement = kineticComponent.startMovement();

// Move the map. If the last argument is omitted, no movement occurs
// (simulation mode); the kinetic panning component simply records it
// for the sliding phase calculations.
kineticMovement.move(47, 11, 08, 15, true, evt.timeStamp);
```

www.EngineeringBooksPdf.com

```
//...

// Finish the recording and release the map, which causes the
// sliding phase to start. You can't reuse a kinetic movement, so
// after calling endMovement(), all further calls to move() are
// ignored.
kineticMovement.endMovement();

// From now on the map continues to slide until another kinetic movement
 occurs
// or the map speed decelerates to zero due to simulated friction.
kineticMovement.addObserver(
  "finished",
  function(kineticMovement, key, value, oldValue) {
     if (value===true) {
      alert("kinetic movement "+
    (this.aborted?"was aborted":"finished successfully")+
    "!");
   }
    },
    this
);
```

Constructor Details

nokia.maps.map.component.panning.Kinetic(props)

This method initializes an instance of `Kinetic`, using the properties supplied by the caller. The method is a virtual constructor for the component.

Parameters:

`props`:	`{Object}`
	The default observable key-value pairs for this component (see nokia.maps.util.OObject).

Class: Tap

This class is a member of ***nokia.maps.map.component.panning***.

Extends: *nokia.maps.map.component.Component*

Class Summary

This component pans the map when the user taps in the map.

[*For full details, see nokia.maps.map.component.panning.Tap*]

www.EngineeringBooksPdf.com

Table 159: Property Summary

Properties
enabled: {Boolean} This property determines if Tap is enabled (true) or not (false).
useKineticPanning: {Boolean} This property determines if Tap is to use kinetic panning when available (true) or not (false).

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This component pans the map when the user taps in the map.

Constructor Details

nokia.maps.map.component.panning.Tap(props)

This method initializes an instance of Tap, using the properties supplied by the caller. The method is a virtual constructor for the component.

Parameters:

props:	{Object} The default observable key-value pairs for this component (see nokia.maps.util.OObject).

www.EngineeringBooksPdf.com

Property Details

`enabled`: `{Boolean}`

This property determines if `Tap` is enabled (`true`) or not (`false`).

`useKineticPanning`: `{Boolean}`

This property determines if `Tap` is to use kinetic panning when available (`true`) or not (`false`).

Namespace: zoom

This namespace is a member of ***`nokia.maps.map.component`***.

Namespace Summary

This namespace implements zooming functionality, allowing the map zoom to change when the user clicks or taps on the map, scrolls the mouse wheel or uses gestures.

Namespace Description

This namespace implements zooming functionality, allowing the map zoom to change when the user clicks or taps on the map, scrolls the mouse wheel or uses gestures.

Class: DoubleClick

This class is a member of ***`nokia.maps.map.component.zoom`***.

Extends: *nokia.maps.map.component.Component*

Class Summary

This class represents a component that zooms the map when the user double clicks into it.

[*For full details, see nokia.maps.map.component.zoom.DoubleClick*]

Table 160: Property Summary

Properties
`enabled`: `{Boolean}` This property determines if the component is enabled (`true`) or disabled (`false`).

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

www.EngineeringBooksPdf.com

mapDisplay

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This class represents a component that zooms the map when the user double clicks into it. It zooms in on a left mouse button double click and zooms out on a right mouse button double click.

Constructor Details

`nokia.maps.map.component.zoom.DoubleClick``(props)`

This method initializes an instance of `DoubleClick`, using the properties supplied by the caller. The method is a virtual constructor for the component.

Parameters:

`props`:	`{Object}`	The default observable key-value pairs for this component (see nokia.maps.util.OObject).

Property Details

`enabled``: {Boolean}`

This property determines if the component is enabled (`true`) or disabled (`false`). When `nokia.maps.map.component.zoom.DoubleClick` is disabled, zooming in response to mouse double clicks does not occur.

Class: DoubleTap

This class is a member of ***`nokia.maps.map.component.zoom`***.

Extends: *nokia.maps.map.component.Component*

www.EngineeringBooksPdf.com

Class Summary

This class represents a component that zooms in the map view when the user taps twice on the map on a touch screen.

[*For full details, see nokia.maps.map.component.zoom.DoubleTap*]

Table 161: Property Summary

Properties
enabled: {Boolean} This property determines if the component is enabled (`true`) or disabled (`false`).

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This class represents a component that zooms in the map view when the user taps twice on the map on a touch screen.

Constructor Details

`nokia.maps.map.component.zoom.DoubleTap``(props)`

This method initializes an instance of `DoubleTap`, using the properties supplied by the caller. The method is a virtual constructor for the component.

Parameters:

`props:` `{Object}`

www.EngineeringBooksPdf.com

The default observable key-value pairs for this component (see nokia.maps.util.OObject).

Property Details

`enabled`: `{Boolean}`

This property determines if the component is enabled (`true`) or disabled (`false`). When `nokia.maps.map.component.zoom.DoubleTap` is disabled, zooming on double tap does not occur.

Class: Gesture

This class is a member of ***`nokia.maps.map.component.zoom`***.

Extends: *nokia.maps.map.component.Component*

Class Summary

This component will zoom the map if the user makes a zoom gesture at a touch screen.

[*For full details, see nokia.maps.map.component.zoom.Gesture*]

Table 162: Property Summary

Properties
`enabled`: `{Boolean}` If this property is false, then the component will be disabled and no zoom will occur.

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

www.EngineeringBooksPdf.com

Class Description

This component will zoom the map if the user makes a zoom gesture at a touch screen.

Constructor Details

`nokia.maps.map.component.zoom.Gesture()`

This method initializes an instance of `Gesture`.

Property Details

`enabled: {Boolean}`

If this property is false, then the component will be disabled and no zoom will occur.

Class: MouseWheel

This class is a member of ***`nokia.maps.map.component.zoom`***.

Extends: *nokia.maps.map.component.Component*

Class Summary

This class represents a component that zooms in the map view when the user taps twice on the map on a touch screen.

[*For full details, see nokia.maps.map.component.zoom.MouseWheel*]

Table 163: Property Summary

Properties
`enabled``: {Boolean}` This property determines if the component is enabled (`true`) or disabled (`false`).

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

www.EngineeringBooksPdf.com

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This class represents a component that zooms in the map view when the user taps twice on the map on a touch screen.

Constructor Details

`nokia.maps.map.component.zoom.MouseWheel()`

This method initializes an instance of `MouseWheel`.

Property Details

`enabled`: `{Boolean}`

This property determines if the component is enabled (`true`) or disabled (`false`). When `nokia.maps.map.component.zoom.MouseWheel` is disabled, zooming in response to double taps does not occur.

Namespace: provider

This namespace is a member of ***`nokia.maps.map`***.

Namespace Summary

This namespace provides basic provider classes that can be extended and used for providing own tiles or objects to map.

Namespace Description

This namespace provides basic provider classes that can be extended and used for providing own tiles or objects to map.

Class: BitmapProvider

This class is a member of ***`nokia.maps.map.provider`***.

Extends: *nokia.maps.map.provider.Provider*

www.EngineeringBooksPdf.com

Class Summary

This is an class representing a bitmap provider.

[*For full details, see nokia.maps.map.provider.BitmapProvider*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.provider.Provider* :

description, *getInvalidationMark*, *id*, *label*, *max*, *min*

Table 164: Method Summary

Methods
create `(id, bBox, cacheOnly) : {`*`nokia.maps.map.provider.BitmapProvider.Request`*`}` This method creates bitmap data.
getId `() : {String}` This method returns created request ID.
request `(bBox, cacheOnly, callback) : {`*`nokia.maps.map.provider.BitmapProvider.Request`*`	undefined}` Method requests an bitmap specified by getUrl method if given screen bounding box intersects with provider bounding box.

Directly Inherited Methods

Inherited from class *nokia.maps.map.provider.Provider* :

getCopyrights, *providesLevel*, *shutdown*, *update*

Inherited from class *nokia.maps.util.EventTarget* :

addListener, *dispatch*, *removeListener*

Event Summary

Directly Inherited Events

Inherited from class *nokia.maps.map.provider.Provider* :

response, *update*

www.EngineeringBooksPdf.com

Class Description

This provider is helpful to display bitmap in given bounding box. When updateCycle property is set than bitmap is periodically exchanged.

Constructor Details

nokia.maps.map.provider.BitmapProvider(options)

This method initializes the bitmap provider, using the caller-supplied options.

Parameters:

options:	{*nokia.maps.map.provider.BitmapProvider.Options*}

Method Details

create(id, bBox, cacheOnly):
{*nokia.maps.map.provider.BitmapProvider.Request*}

This method creates bitmap data.

Parameters:

id:	{String} Id of created bitmap request.
bBox:	{*nokia.maps.geo.BoundingBox*} BoundingBox returned by nokia.maps.map.provider.BitmapProvider#getBoundingBox method.
cacheOnly:	{Boolean} A flag to signal that bitmap is created in cacheOnly mode, see *nokia.maps.map.provider.BitmapProvider#request* method.

Returns:

{*nokia.maps.map.provider.BitmapProvider.Request*}

getId(): {String}

www.EngineeringBooksPdf.com

This method returns created request ID.

Returns:

`{String}`

`request``(bBox, cacheOnly, callback):`
`{`*`nokia.maps.map.provider.BitmapProvider.Request`*` | undefined}`

Method requests an bitmap specified by getUrl method if given screen bounding box intersects with provider bounding box.

Parameters:

`bBox`:	`{`*`nokia.maps.geo.BoundingBox`*`}`
	Screen bounding box.
`cacheOnly`:	`{boolean}` [optional, default: false]
	A flag to signal that only cached bitmaps should be taken into account
`callback`:	`{function(nokia.maps.map.provider.BitmapProvider.Request}`
	Callback given by layer called when bitmap request was finished.

Returns:

`{`*`nokia.maps.map.provider.BitmapProvider.Request`*
`| undefined}`

The Request object which is handling bitmap image creation or `undefined` to signal "non provided" for request which are not covered by provider bounding box.

Interface: Options

This interface is a member of ***`nokia.maps.map.provider.BitmapProvider`***.

Interface Summary

This interface defines properties of class `BitmapProvider`

[*For full details, see nokia.maps.map.provider.BitmapProvider.Options*]

www.EngineeringBooksPdf.com

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.provider.Provider.Options* :

description, *getCopyrights*, *label*, *max*, *min*, *updateCycle*

Table 165: Method Summary

Methods
getBoundingBox `()` : {*nokia.maps.geo.BoundingBox*} Returns the bounding box of a provided image.

Interface Description

This interface defines properties of class `BitmapProvider`

Method Details

`getBoundingBox``(): {`*nokia.maps.geo.BoundingBox*`}`

Returns the bounding box of a provided image.

Returns:

{*nokia.maps.geo.BoundingBox*}

Class: Request

This class is a member of ***nokia.maps.map.provider.BitmapProvider***.

Class Summary

This is an class representing a bitmap provider request object.

[*For full details, see nokia.maps.map.provider.BitmapProvider.Request*]

Table 166: Property Summary

Properties
bbox: {*nokia.maps.geo.BoundingBox*} Holds bounding box for which request was triggered.
data: {*}

www.EngineeringBooksPdf.com

Properties
Holds the data of Request.
id: {String} Holds id of request.
state: {Boolean | undefined} Holds the state of the request.

Table 167: Method Summary

Methods
abort () Aborts the ongoing bitmap image request
send (onStateChange) Fires request to crate new bitmap image

Class Description

This is an helper class which holds all necessary information to finalize bitmap request (paint it or request from server).

Constructor Details

nokia.maps.map.provider.BitmapProvider.Request(id, bbox, provider)

This method initializes the bitmap provider request.

Parameters:

id:	{String}
	Request id
bbox:	{*nokia.maps.geo.BoundingBox*}
	Requested bounding box
provider:	{*nokia.maps.map.provider.Provider*}
	Provider which create instance of request

www.EngineeringBooksPdf.com

Property Details

bbox: {*nokia.maps.geo.BoundingBox*}

Holds bounding box for which request was triggered.

data: {*}

Holds the data of Request.

id: {String}

Holds id of request.

state: {Boolean | undefined}

Holds the state of the request. Value `undefined` means undefined state. Value `true` means that request was successful. Value `false` means that request wasn't successful.

Method Details

abort()

Aborts the ongoing bitmap image request

send(onStateChange)

Fires request to crate new bitmap image

Parameters:

onStateChange:	{Function(nokia.maps.map.provider.BitmapProvider.Request)} Callback called when state changed

Class: CanvasProvider

This class is a member of ***nokia.maps.map.provider***.

Extends: *nokia.maps.map.provider.BitmapProvider*

www.EngineeringBooksPdf.com

Class Summary

This class represents a provider a canvas object that supports drawing.

[*For full details, see nokia.maps.map.provider.CanvasProvider*]

Table 168: Property Summary

Properties
draw: This method draws an image on the canvas specified by the caller.
getBoundingBox: {*nokia.maps.geo.BoundingBox*} This function retrieves the bounding box of a provided image.

Directly Inherited Properties

Inherited from class *nokia.maps.map.provider.Provider* :

description, *getInvalidationMark*, *id*, *label*, *max*, *min*

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.provider.BitmapProvider* :

create, *getId*, *request*

Inherited from class *nokia.maps.map.provider.Provider* :

getCopyrights, *providesLevel*, *shutdown*, *update*

Inherited from class *nokia.maps.util.EventTarget* :

addListener, *dispatch*, *removeListener*

Event Summary

Directly Inherited Events

Inherited from class *nokia.maps.map.provider.Provider* :

response, *update*

Class Description

This class represents a provider a canvas object that supports drawing.

www.EngineeringBooksPdf.com

Constructor Details

nokia.maps.map.provider.CanvasProvider(options)

This method initializes the canvas provider using the caller-supplied options.

Parameters:

options: {*nokia.maps.map.provider.CanvasProvider.Options*}

An object containing instance intialization prameters.

Example:

```
map = new nokia.maps.map.Display(...);
var cycleIndex = 0,
    canvasProvider = new nokia.maps.map.provider.CanvasProvider({
         min: 0,
         max: 20,
         opacity: 0.5,
         updateCycle: 1/10, //seconds
         draw: function(canvas, callback) {
             var ctx = canvas.getContext("2d");
             canvas.width = 500;
             canvas.height = 500;

             ctx.fillStyle = "rgb(200,0,0)";
             ctx.fillRect (0, 0, canvas.width, canvas.height);

             ctx.font = "100pt Arial";
             ctx.fillStyle = "rgb(200,200,0)";
             ctx.fillText("" + (1+cycleIndex), 10, 110);

             // The following call is mandatory, it triggers the
             // actual render on the map
             callback(canvas, true, true);
         },
         getBoundingBox: function () {
             return new nokia.maps.geo.BoundingBox([54.992047222,
1.912952778],
                                                   [46.855536111,
15.898755556])
         }
    });

canvasProvider.addListener("update", function (evt) {
    cycleIndex = ++cycleIndex % 10 || 0;
});

map.overlays.add(canvasProvider);
```

www.EngineeringBooksPdf.com

Property Details

`draw`:

This method draws an image on the canvas specified by the caller. The method must be supplied by `CanvasProvider` instances.

`getBoundingBox`: *{nokia.maps.geo.BoundingBox}*

This function retrieves the bounding box of a provided image. This function must be supplied by `CanvasProvider` instances.

Interface: Options

This interface is a member of ***`nokia.maps.map.provider.CanvasProvider`***.

Extends: *nokia.maps.map.provider.BitmapProvider.Options*

Interface Summary

This interface defines properties of the class {@link nokia.maps.map.provider.CanvasProvider}.

[*For full details, see nokia.maps.map.provider.CanvasProvider.Options*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.provider.Provider.Options* :

description, *getCopyrights*, *label*, *max*, *min*, *updateCycle*

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.provider.BitmapProvider.Options* :

getBoundingBox

Interface Description

This interface defines properties of the class {@link nokia.maps.map.provider.CanvasProvider}.

Class: Request

This class is a member of ***`nokia.maps.map.provider.CanvasProvider`***.

www.EngineeringBooksPdf.com

Extends: *nokia.maps.map.provider.BitmapProvider.Request*

Class Summary

This class represents a canvas provider request object.

[*For full details, see nokia.maps.map.provider.CanvasProvider.Request*]

Table 169: Property Summary

Properties
data: {HTMLCanvasElement} This property holds the data associated with the request, which is and instance of `HTMLCanvasElement`.

Directly Inherited Properties

Inherited from class *nokia.maps.map.provider.BitmapProvider.Request* :

bbox, *data*, *id*, *state*

Table 170: Method Summary

Methods
abort () This method aborts a pending draw canvas request.
send (onStateChange) This method sends a request to crate new canvas image.

Directly Inherited Methods

Inherited from class *nokia.maps.map.provider.BitmapProvider.Request* :

abort, *send*

Class Description

This is a helper class which holds a reference to requested canvas, the related bounding box and a callback.

Constructor Details

nokia.maps.map.provider.CanvasProvider.Request(id, bbox, provider)

This method initializes the canvas provider request.

www.EngineeringBooksPdf.com

Parameters:

id:	{String} Request id
bbox:	{*nokia.maps.geo.BoundingBox*} An object representing the requested bounding box
provider:	{*nokia.maps.map.provider.Provider*} An object representing the provider to which the request is addressed.

Property Details

data: {HTMLCanvasElement}

This property holds the data associated with the request, which is and instance of HTMLCanvasElement.

Method Details

abort()

This method aborts a pending draw canvas request.

send(onStateChange)

This method sends a request to crate new canvas image.

Parameters:

onStateChange:	{Function(nokia.maps.map.provider.CanvasProvider.Request)} A callback function to be invoked when the image state has changed.

Interface: IData

This interface is a member of ***nokia.maps.map.provider***.

Interface Summary

An interface for a data object which is provided by a nokia.maps.map.Provider.

[*For full details, see nokia.maps.map.provider.IData*]

www.EngineeringBooksPdf.com

Table 171: Property Summary

Properties
id: {String} The ID of the provider data.

Table 172: Method Summary

Methods
getInvalidations (invalidationMark) : {Number} To obtain the invalidation states of a provider's data.

Interface Description

An interface for a data object which is provided by a nokia.maps.map.Provider.

Property Details

id: {String}

The ID of the provider data. The ID starts with the ID of the provider which provided the data object followed by an underscore "_".

Method Details

getInvalidations(invalidationMark): {Number}

To obtain the invalidation states of a provider's data.

Parameters:

invalidationMark: {Number}	A invalidationMark to check against.

Returns:

{Number}	a bit mask which specifies the invalid parts of the checked provider date. If no bit is set (value 0) the provider data is valid. The meaning of all bits has to be defined by concrete Provider implementation which provides the data.

www.EngineeringBooksPdf.com

Class: ImageProvider

This class is a member of ***nokia.maps.map.provider***.

Extends: *nokia.maps.map.provider.BitmapProvider*

Class Summary

This class represents an image provider.

[*For full details, see nokia.maps.map.provider.ImageProvider*]

Table 173: Property Summary

Properties
getBoundingBox: {*nokia.maps.geo.BoundingBox*} This method retrieves the bounding box of the image.
getUrl: {String} This method retrieves the URL of the image associated with the given instance `nokia.maps.map.provider.ImageProvider`.

Directly Inherited Properties

Inherited from class *nokia.maps.map.provider.Provider* :

description, *getInvalidationMark*, *id*, *label*, *max*, *min*

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.provider.BitmapProvider* :

create, *getId*, *request*

Inherited from class *nokia.maps.map.provider.Provider* :

getCopyrights, *providesLevel*, *shutdown*, *update*

Inherited from class *nokia.maps.util.EventTarget* :

addListener, *dispatch*, *removeListener*

Event Summary

Directly Inherited Events

www.EngineeringBooksPdf.com

Inherited from class *nokia.maps.map.provider.Provider* :

response, *update*

Class Description

This class represents an image provider. It displays an image in a bounding box. When the property `updateCycle` is set, then the image is periodically exchanged.

Constructor Details

`nokia.maps.map.provider.ImageProvider``(options)`

This method initializes the image provider, using the caller-supplied options.

Parameters:

`options`: {*`nokia.maps.map.provider.ImageProvider.Options`*}

An object containing instance intialization prameters.

Example:

```
map = new nokia.maps.map.Display(...);
//create and ImageProvider
var imageIds = "image1.jpg image2.jpg image3.jpg image4.jpg".split(" "),
    numberOfImagesToCache = 4,
    cycleIndex = 0,
    rainRadar = new nokia.maps.map.provider.ImageProvider({
        min: 0,
        max: 20,
        getBoundingBox: function () {
           return new nokia.maps.geo.BoundingBox([54.992047222,
 1.912952778],
                                                 [46.855536111,
 15.898755556]);
        },
        getUrl: function () {
            return "http://example.com/" + imageIds[cycleIndex];
        },
        updateCycle: 2/3, //seconds
        cache: new nokia.maps.util.Cache(numberOfImagesToCache)
    });

    rainRadar.addListener("update", function (evt) {
         cycleIndex = ++cycleIndex % imageIds.length || 0;
    });

    map.overlays.add(rainRadar);
```

www.EngineeringBooksPdf.com

Property Details

`getBoundingBox`: `{nokia.maps.geo.BoundingBox}`

This method retrieves the bounding box of the image. This method must be supplied by instances of `nokia.maps.map.provider.ImageProvider`.

`getUrl`: `{String}`

This method retrieves the URL of the image associated with the given instance `nokia.maps.map.provider.ImageProvider`. This method must be supplied by instances of `nokia.maps.map.provider.ImageProvider`.

Interface: Options

This interface is a member of ***`nokia.maps.map.provider.ImageProvider`***.

Extends: *nokia.maps.map.provider.BitmapProvider.Options*

Interface Summary

This interface defines the properties of the class {@link nokia.maps.map.provider.ImageProvider}.

[*For full details, see nokia.maps.map.provider.ImageProvider.Options*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.provider.Provider.Options* :

description, *getCopyrights*, *label*, *max*, *min*, *updateCycle*

Table 174: Method Summary

Methods
`draw` `(callback)` This method draws a new image on the specified canvas.
`getUrl` `() : {String}` This method retrieves the URL of the image associated with the given instance of `ImageProvider`.

Directly Inherited Methods

Inherited from class *nokia.maps.map.provider.BitmapProvider.Options* :

www.EngineeringBooksPdf.com

getBoundingBox

Interface Description

This interface defines the properties of the class {@link nokia.maps.map.provider.ImageProvider}.

Method Details

`draw``(callback)`

This method draws a new image on the specified canvas. The method must be implemented by instances of {@link nokia.maps.map.provider.ImageProvider}.

Parameters:

`callback`: `{Function(HTMLCanvasElement|Boolean|Boolean)}`

Callback function to be called when the new image is drawn to canvas. Its parameters are:

- canvas (HTMLCanvasElement) - An object representing the canvas on which to draw
- drawn (Boolean) - `true` if drawing was successful, otherwise `false`. The value is set to `false` when nothing was drawn, for example, because no data were provided.
- synchronous (Boolean) - `true` if the callback is called synchronously, otherwise `false`

`getUrl``(): {String}`

This method retrieves the URL of the image associated with the given instance of `ImageProvider`.

Returns:

`{String}` The URL of the image associated with the given instance of `ImageProvider`.

Class: Request

This class is a member of ***`nokia.maps.map.provider.ImageProvider`***.

Extends: *nokia.maps.map.provider.BitmapProvider.Request*

www.EngineeringBooksPdf.com

Class Summary

This is a class representing an image provider request object.

[*For full details, see nokia.maps.map.provider.ImageProvider.Request*]

Table 175: Property Summary

Properties
data: {Image} This property holds the data associated with the request, which is the image object.
id: {String} This property holds the id of the request.

Directly Inherited Properties

Inherited from class *nokia.maps.map.provider.BitmapProvider.Request* :

bbox, *data*, *id*, *state*

Table 176: Method Summary

Methods
abort () This method aborts the pending image provider request.
send (onStateChange) This method sends a request for notification to the image provider.

Directly Inherited Methods

Inherited from class *nokia.maps.map.provider.BitmapProvider.Request* :

abort, *send*

Class Description

This is a helper class which holds a reference to the requested image and the related bounding box and callback.

Constructor Details

nokia.maps.map.provider.ImageProvider.Request(id, bbox, provider)

www.EngineeringBooksPdf.com

This method initializes an image provider request.

Parameters:

id:	{String} The request id for ImageTile.Request; the value is URL of the image.
bbox:	{*nokia.maps.geo.BoundingBox*} An object representing the bounding box (containing the image).
provider:	{*nokia.maps.map.provider.Provider*} An object representing the provider to which the request is addressed

Property Details

data: {Image}

This property holds the data associated with the request, which is the image object.

id: {String}

This property holds the id of the request. In this case the id is the URL of the image.

Method Details

abort()

This method aborts the pending image provider request.

send(onStateChange)

This method sends a request for notification to the image provider.

Parameters:

onStateChange:	{Function(nokia.maps.map.provider.ImageProvider.Request)} A callback function to be called when the image state has changed.

Class: ImgTileProvider

This class is a member of ***nokia.maps.map.provider***.

www.EngineeringBooksPdf.com

Extends: *nokia.maps.map.provider.TileProvider*

Class Summary

This class provides Image objects as map tiles.

[*For full details, see nokia.maps.map.provider.ImgTileProvider*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.provider.TileProvider* :

pixelProjections

Inherited from class *nokia.maps.map.provider.Provider* :

description, *getInvalidationMark*, *id*, *label*, *max*, *min*

Method Summary

Directly Inherited Methods

Inherited from class *nokia.maps.map.provider.TileProvider* :

cancel, *checkAddy*, *create*, *createId*, *destroy*, *request*

Inherited from class *nokia.maps.map.provider.Provider* :

getCopyrights, *providesLevel*, *shutdown*, *update*

Inherited from class *nokia.maps.util.EventTarget* :

addListener, *dispatch*, *removeListener*

Event Summary

Directly Inherited Events

Inherited from class *nokia.maps.map.provider.Provider* :

response, *update*

Class Description

A class to provide Image objects as tiles. These Implementation of a TileProvider tries to load Images from a URL which will be specified by the ImgTileProvider instance. The world is repeating on x-axis.

www.EngineeringBooksPdf.com

Constructor Details

nokia.maps.map.provider.ImgTileProvider(options)

Parameters:

options: {*nokia.maps.map.provider.ImgTileProvider.Options*}

Interface: Options

This interface is a member of ***nokia.maps.map.provider.ImgTileProvider***.

Interface Summary

The interface defines properties of class `ImgTileProvider`

[*For full details, see nokia.maps.map.provider.ImgTileProvider.Options*]

Table 177: Property Summary

Properties
timeout: {number} A timeout in milliseconds to define a duration within which a failed image load is treated as a valid server response.

Directly Inherited Properties

Inherited from class *nokia.maps.map.provider.TileProvider.Options* :

alpha, *cache*, *opacity*, *scalable*

Inherited from class *nokia.maps.map.provider.Provider.Options* :

description, *getCopyrights*, *label*, *max*, *min*, *updateCycle*

Table 178: Method Summary

Methods
getUrl (level, row, col) : {string} A method to create the URL for the specified tile.

Interface Description

The interface defines properties of class `ImgTileProvider`

www.EngineeringBooksPdf.com

Property Details

`timeout`: `{number}`

A timeout in milliseconds to define a duration within which a failed image load is treated as a valid server response. To never treat a failed image load as valid server response this value should be set to a negative value.

Default Value: `30000`

Method Details

`getUrl``(level, row, col): {string}`

A method to create the URL for the specified tile.

Parameters:

`level`:	`{number}`
	The zoom level of the requested tile URL.
`row`:	`{number}`
	The row of the requested tile URL.
`col`:	`{number}`
	The column of the requested tile URL.

Returns:

`{string}`	The URL of the requested tile or `false` if the tile is not provided

Class: Provider

This class is a member of ***`nokia.maps.map.provider`***.

Extends: *nokia.maps.util.EventTarget*

Class Summary

This is an abstract class that represents a map provider.

[*For full details, see nokia.maps.map.provider.Provider*]

www.EngineeringBooksPdf.com

Table 179: Property Summary

Properties
description: {String} This property holds a description of the provider to be used in the user interface, for example in tool tips.
getInvalidationMark: {Number} This method retrieves the last invalidation mark for the provider data.
readonly ***id***: {Number} This property holds the id of the `Provider` instance.
label: {String} This property represents a label for the provider to be displayed in the user interface.
max: {Number} This property indicates the maximum zoom level.
min: {Number} This property indicates the minimum zoom level.

Table 180: Method Summary

Methods
getCopyrights (area, zoom) : {Object[]} This method retrieves the copyright information for a specified geographical area and zoom level.
providesLevel (zoomLevel) : {Boolean} This method checks if the zoom level supplied by the caller lies within the range supportd by the given provider object.
shutdown () This method releases resources that were allocated by the provider.
update () This method increases the value of `invalidationMark` and publishes a message with topic `"updated"` asynchronously.

Directly Inherited Methods

Inherited from class *nokia.maps.util.EventTarget* :

addListener, *dispatch*, *removeListener*

www.EngineeringBooksPdf.com

Table 181: Event Summary

Events
response
This event is fired when an asynchronously processing of a request has been finished.
update
This event is fired if when the provider content has been changed.

Class Description

This is an abstract class representing a map provider. A provider can be understood as a data vendor for items such as:

- Map tiles - this is common functionality
- Spatial objects - for example to visualize traffic or public transport lines
- Marker objects - for example to mark stores in a store finder overlay

The constructor for this class initializes an object based on `Provider`, using the argument provided by the caller.

Constructor Details

`nokia.maps.map.provider.Provider``(options)`

Parameters:

`options:` `{`*`nokia.maps.map.provider.Provider.Options`*`}`

Property Details

`description``: {String}`

This property holds a description of the provider to be used in the user interface, for example in tool tips.

Default Value: `""`

`getInvalidationMark``: {Number}`

This method retrieves the last invalidation mark for the provider data.

www.EngineeringBooksPdf.com

See: nokia.maps.map.provider.Provider#getInvalidations

`readonly` **`id`**`: {Number}`

This property holds the id of the `Provider` instance.

`label``: {String}`

This property represents a label for the provider to be displayed in the user interface.

Default Value: `""`

`max``: {Number}`

This property indicates the maximum zoom level. Its value must be an integer in range from -1 to 30. A value of -1 indicates that the provider doesn't provide data in any zoom level.

Default Value: `-1`

`min``: {Number}`

This property indicates the minimum zoom level. Its value must be an integer in the range from 0 to 30.

Default Value: `0`

Method Details

`getCopyrights``(area, zoom): {Object[]}`

This method retrieves the copyright information for a specified geographical area and zoom level. This method can be defined by *nokia.maps.map.provider.Provider.Options#getCopyrights*.

Parameters:

`area`: {*`nokia.maps.geo.BoundingBox`*}

The GEO area for which to obtain the copyright information.

`zoom`: {Number}

www.EngineeringBooksPdf.com

The zoom level for which to obtain the copyright information.

Returns:

`{Object[]}` An array of objects, each containing the string elements "label" and "alt", for example `[ { label: "DigitalGlobe 2009", alt: "copyright 2009 DigitalGlobe, Inc." } ]`

`providesLevel(zoomLevel): {Boolean}`

This method checks if the zoom level supplied by the caller lies within the range supportd by the given provider object.

Parameters:

`zoomLevel:` `{Number}`

The zoom level to check.

Returns:

`{Boolean}` `true` if the supplied zoom level is in range of [min ... max] zoom level supported by the provider, otherwise `false`.

`shutdown()`

This method releases resources that were allocated by the provider. Note that after the method has been called, the engine is unusable.

`update()`

This method increases the value of `invalidationMark` and publishes a message with topic `"updated"` asynchronously.

Event Details

`response`

This event is fired when an asynchronously processing of a request has been finished.

www.EngineeringBooksPdf.com

Event Handler Parameters:	
evt	{*nokia.maps.util.Event*} An object representing the event.

update

This event is fired if when the provider content has been changed.

Event Handler Parameters:	
evt	{*nokia.maps.util.Event*} An object representing the event

Interface: Options

This interface is a member of ***nokia.maps.map.provider.Provider***.

Interface Summary

This interface defines options for the class `Provider` constructor.

[*For full details, see nokia.maps.map.provider.Provider.Options*]

Table 182: Property Summary

Properties
description: {String} This property holds a description of the provider to be used in the user interface, for example in tool tips.
getCopyrights: {Function} This property is designed to hold a function that retrieves copyright information.
label: {String} This property represents a label for the provider, for example to indicate the type or overlay buttons.
max: {Number} This property indicates the maximum zoom level.
min: {Number} This property indicates the initial minimum zoom level.

www.EngineeringBooksPdf.com

Properties
updateCycle: {Number}
This property indicates the interval between automatic update cycles in seconds (integer).

Interface Description

This interface defines options for the class `Provider` constructor.

Property Details

description: {String}

This property holds a description of the provider to be used in the user interface, for example in tool tips.

getCopyrights: {Function}

This property is designed to hold a function that retrieves copyright information.

See: *nokia.maps.map.provider.Provider#getCopyrights*

label: {String}

This property represents a label for the provider, for example to indicate the type or overlay buttons.

max: {Number}

This property indicates the maximum zoom level. Its value must be an integer in range from -1 to 30. A value of -1 indicates that the provider doesn't provide data in any zoom level.

min: {Number}

This property indicates the initial minimum zoom level. Its value must be an integer in the range from 0 to 30.

updateCycle: {Number}

www.EngineeringBooksPdf.com

This property indicates the interval between automatic update cycles in seconds (integer). If the value is less then 1 the property is ignored. See also *nokia.maps.map.provider.Provider#update*

Class: TileProvider

This class is a member of ***nokia.maps.map.provider***.

Extends: *nokia.maps.map.provider.Provider*

Class Summary

This is an abstract base class representing a tile provider.

[*For full details, see nokia.maps.map.provider.TileProvider*]

Table 183: Property Summary

Properties
`readonly` ***pixelProjections***`: {Object}` This property holds a hash table of pixel projections for for all supported integral levels [min .

Directly Inherited Properties

Inherited from class *nokia.maps.map.provider.Provider* :

description, *getInvalidationMark*, *id*, *label*, *max*, *min*

Table 184: Method Summary

Methods
cancel `(id) : {nokia.maps.map.provider.Tile}` This method informs the TileProvider that a requested tile is no longer required.
checkAddy `(level, row, col) : {Number}` This method checks if a tile address (level, row, column) is valid and, if necessary, adjusts the column (repeating world on x-axis).
create `(level, row, col, id, cacheOnly) : {nokia.maps.map.provider.Tile}` This method creates a new tile.
createId `(level, row, col, noCheck) : {String}` This method creates a unique tile id if the specified tile would provided.
destroy `()` This method destroys a TileProvider and frees resources.

www.EngineeringBooksPdf.com

Methods
request `(level, row, col, cacheOnly) : {nokia.maps.map.provider.Tile | Boolean}`
This method requests a specified tile.

Directly Inherited Methods

Inherited from class *nokia.maps.map.provider.Provider* :

getCopyrights, *providesLevel*, *shutdown*, *update*

Inherited from class *nokia.maps.util.EventTarget* :

addListener, *dispatch*, *removeListener*

Event Summary

Directly Inherited Events

Inherited from class *nokia.maps.map.provider.Provider* :

response, *update*

Class Description

This is an abstract base class representing a tile provider. Derived classes must implement the `create()` method.

Constructor Details

`nokia.maps.map.provider.TileProvider``(options)`

This method initializes the tile provider, using the caller-supplied options.

Parameters:

`options:` `{`*`nokia.maps.map.provider.TileProvider.Options`*`}`

Property Details

`readonly` **`pixelProjections`**`: {Object}`

This property holds a hash table of pixel projections for for all supported integral levels [min ... max].

www.EngineeringBooksPdf.com

Method Details

cancel(id): {nokia.maps.map.provider.Tile}

This method informs the TileProvider that a requested tile is no longer required.

Parameters:

id:	{String}
	The id of the requested tile

Returns:

{nokia.maps.map.provider.Tile}	A tile object whose loading has been cancelled, otherwise undefined.

checkAddy(level, row, col): {Number}

This method checks if a tile address (level, row, column) is valid and, if necessary, adjusts the column (repeating world on x-axis).

Parameters:

level:	{Number}
	The zoom level of the requested tile
row:	{Number}
	The row of the requested tile
col:	{Number}
	The column of the requested tile

Returns:

{Number}	The adjusted column if the tile address is valid, otherwise -1

create(level, row, col, id, cacheOnly): {nokia.maps.map.provider.Tile}

This method creates a new tile. This method must be implemented by derived classes. The method is used internally by a TileProvider instance when a tile is requested.

www.EngineeringBooksPdf.com

Parameters:

`level`:	`{Number}`
	The zoom level of the requested tile
`row`:	`{Number}`
	The row of the requested tile
`col`:	`{Number}`
	The column of the requested tile
`id`:	`{String}`
	The ID of the requested tile
`cacheOnly`:	`{Boolean}` [optional, default: false]
	A flag to signal that only cached tiles should take into account

Returns:

`{nokia.maps.map.provider.Tile}` The requested tile

`createId(level, row, col, noCheck): {String}`

This method creates a unique tile id if the specified tile would provided. The id starts with the TileProvider id followed by an underscore ("_"). If the TileProvider uses the same ids for different tiles (for example repeating on x-axis), the id must be adjusted.

The standard implementation returns `false` for the following cases:

- if level is less this.min
- if level is greater this.max
- if row is negative
- if row is greater than 2^level (the numbers of tiles per axis for this level)

Otherwise it returns an ID in this format: "providerId_level_row_col", where col is adjusted to the range of [0 ... number_of_tiles_per_axis].

Parameters:

`level`:	`{Number}`

www.EngineeringBooksPdf.com

	The zoom level of the requested tile
row:	{Number}
	The row of the requested tile
col:	{Number}
	The column of the requested tile
noCheck:	{Boolean} [optional, default: false]
	A flag to signal that the ID should created without validation check

Returns:

{String}	The created ID or false if the requested tile is not provided

destroy()

This method destroys a TileProvider and frees resources.

request(level, row, col, cacheOnly): {nokia.maps.map.provider.Tile | Boolean}

This method requests a specified tile. IMPLEMENTATION HINTS:

- cacheOnly is true:
  - returns a Tile: TileProvider was able to create the requested Tile instantly.
  - returns true: The Tile ID found in TileIdCache but the TileProvider will provide the requested Tile delayed (see "response" event).
  - returns false: The TileProvider doesn't provide the requested Tile or the requested Tile was not found in Cache.
- cacheOnly was set to false (or omitted):
  - returns a Tile: TileProvider was able to create the requested Tile instantly.
  - returns true: The TileProvider will provide the requested Tile delayed.
  - returns false (or undefined): The TileProvider does not provide the requested Tile.
- The TileProvider should take into account that more than one customer could request one and the same tile. Therefore a separate counter for each item of the requestedTiles list is necessary. A request() call has to increase this counter.

www.EngineeringBooksPdf.com

Parameters:

`level`:	`{number}` The zoom level of the requested tile
`row`:	`{number}` The row of the requested tile
`col`:	`{number}` The column of the requested tile
`cacheOnly`:	`{boolean}` [optional, default: false] A flag to signal that only cached tiles should be taken into account

Returns:

`{nokia.maps.map.provider.Tile | Boolean}`	The requested tile if it could created immediately or `false` to signal "not provided/not cached" or `true` to signal "will possibly provide with a delay".
See:	nokia.maps.map.provider.TileProvider#response

Interface: Options

This interface is a member of ***`nokia.maps.map.provider.TileProvider`***.

Interface Summary

This interface defines properties of class `TileProvider`

[*For full details, see nokia.maps.map.provider.TileProvider.Options*]

Table 185: Property Summary

Properties
`alpha``: {Boolean}` This property is a flag that indicates if the provided tiles use PNG alpha transparency.
`cache``: {`*`nokia.maps.util.Cache`*`}` This property holds the tile cache.
`opacity``: {Number}` This property holds the opacity as a value between 0 (transparent) and 1 (opaque) to use for all tiles of the given provider.

www.EngineeringBooksPdf.com

Properties
scalable:
This property is a flag that indicates if the provided tiles may be scaled during zoom level changes of the map.

Directly Inherited Properties

Inherited from class *nokia.maps.map.provider.Provider.Options* :

description, *getCopyrights*, *label*, *max*, *min*, *updateCycle*

Interface Description

This interface defines properties of class `TileProvider`

Property Details

`alpha: {Boolean}`

This property is a flag that indicates if the provided tiles use PNG alpha transparency. This is needed to support PNG alpha transparency in older browsers.

Default Value: `false`

`cache: {nokia.maps.util.Cache}`

This property holds the tile cache. If omitted, a global three-level cache (optimized for tiles) is used. If the property is set to `null`, no cache is used.

Default Value: `nokia.maps.map.provider.TileProvider.prototype.cache`

`opacity: {Number}`

This property holds the opacity as a value between 0 (transparent) and 1 (opaque) to use for all tiles of the given provider.

Default Value: `1`

`scalable:`

www.EngineeringBooksPdf.com

This property is a flag that indicates if the provided tiles may be scaled during zoom level changes of the map.

Default Value: `true`

Namespace: positioning

This namespace is a member of ***`nokia.maps`***.

Namespace Summary

This namespace defines facilities related to positioning and specifically an implementation of the W3C Geolocation API.

Namespace Description

This namespace defines facilities related to positioning and specifically an implementation of the W3C Geolocation API.

Class: Manager

This class is a member of ***`nokia.maps.positioning`***.

Extends: *nokia.maps.util.OObject*

Class Summary

This class provides a set of methods based on the W3C geolocation API specification.

[*For full details, see nokia.maps.positioning.Manager*]

Table 186: Method Summary

Methods
`clearWatch` `(watchId)` This method clears and stops the specified position watch.
`getCurrentPosition` `(successCallback, errorCallback, options)` This method retrieves the current position, if available, and fires an event containing the data.
`watchPosition` `(successCallback, errorCallback, options) : {Number}` This method starts periodic monitoring of the position sensor and fires events containing any new or changed data collected from the sensor.

www.EngineeringBooksPdf.com

Directly Inherited Methods

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This class provides a set of methods based on the specification of the W3C geolocation API. The API reference can be found *here*.

Constructor Details

`nokia.maps.positioning.Manager()`

This method initializes an instance of of `positioning.Manager`.

Method Details

`clearWatch(watchId)`

This method clears and stops the specified position watch.

Parameters:

`watchId:`	`{Number}`
	represents the watcher ID returned from *nokia.maps.positioning.Manager#watchPosition*.

`getCurrentPosition(successCallback, errorCallback, options)`

This method retrieves the current position, if available, and fires an event containing the data.

Parameters:

`successCallback:`	`{Function}`
	A function to call when the position data is available
`errorCallback:`	`{Function}`
	A function to call when there is an error getting the position data
`options:`	`{Object}`

www.EngineeringBooksPdf.com

An anonymous object containing options for getting the position data

`watchPosition(successCallback, errorCallback, options): {Number}`

This method starts periodic monitoring of the position sensor and fires events containing any new or changed data collected from the sensor.

Parameters:

`successCallback:`	`{Function}`
	A function to call when the position data is available
`errorCallback:`	`{Function}`
	A function to call when there is an error retrieving position data
`options:`	`{Object}`
	An anonymous object containing options for retrieving position data

Returns:

`{Number}`	the watcher ID

Namespace: component

This namespace is a member of ***`nokia.maps.positioning`***.

Namespace Summary

This namespace provides facilities to obtain geo-positioning information.

Namespace Description

This namespace provides facilities to obtain geo-positioning information.

Class: Positioning

This class is a member of ***`nokia.maps.positioning.component`***.

Extends: *nokia.maps.map.component.Component*

www.EngineeringBooksPdf.com

Class Summary

This class represents a component which handles geolocation positioning from browser.

[*For full details, see nokia.maps.positioning.component.Positioning*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.map.component.Component* :

mapDisplay

Table 187: Method Summary

Methods
requestPosition `(successCallback, errorCallback)` This method requests the current geo positioning information from the positioning manager.

Directly Inherited Methods

Inherited from class *nokia.maps.map.component.Component* :

attach, *destroy*, *detach*, *getId*

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This class represents a component that switches positioning on and off. It is currently only supported in the nokia_generic UI package. Due to the missing support of the *W3C Geolocation API* it is not working in all Internet Explorer versions up to version 8.

Constructor Details

`nokia.maps.positioning.component.Positioning()`

This method initializes a new instance of `Positioning`.

Method Details

`requestPosition``(successCallback, errorCallback)`

www.EngineeringBooksPdf.com

This method requests the current geo positioning information from the positioning manager. When the position information has been retrieved, the map moves to the current position and an accuracy circle is drawn using the method `#showPosition()`.

Parameters:

`successCallback`: `{Function}`

If a position is found this function would be called.

`errorCallback`: `{Function}`

If error occurs this callback would be executed.

See: *nokia.maps.positioning.Manager*

Namespace: routing

This namespace is a member of ***`nokia.maps`***.

Namespace Summary

This namespace defines facilities for calculating routes and adding them to a map display.

Namespace Description

This namespace defines facilities for calculating routes and adding them to a map display.

Class: Manager

This class is a member of ***`nokia.maps.routing`***.

Extends: *nokia.maps.util.OObject*

Class Summary

This class acts as a proxy to the routing service and is responsible for storing the currently selected routes.

[*For full details, see nokia.maps.routing.Manager*]

www.EngineeringBooksPdf.com

Table 188: Property Summary

Properties
metricSystem: {String} This property holds the metric system information to be used by the backend when return maneuver instructions.
state: {String} This property holds the state of the request sent by the given instance of the `Manager`.

Table 189: Method Summary

Methods
calculateRoute (waypoints, mode) This method invokes the back-end `calculateRoute` service.
clear () This method clears all the stored routes.
destroy () This method cleans up the given instance of `routing.Manager` before releasing it from memory.
getErrorCause () : {*nokia.maps.routing.ServiceError*} This method returns the cause of an error.
getRoutes () : {*nokia.maps.routing.Route*[]} This method retrieves routes that have been calculated by the back end.

Directly Inherited Methods

Inherited from class *nokia.maps.util.OObject* :

addObserver, *get*, *remove*, *removeObserver*, *set*

Class Description

This class acts as a proxy to the routing service and is responsible for storing the currently selected routes.

Constructor Details

nokia.maps.routing.Manager()

This method creates a new empty instance of the Manager class.

www.EngineeringBooksPdf.com

Property Details

metricSystem: {String}

This property holds the metric system information to be used by the backend when return maneuver instructions. It can be one of: undefined (default, metric system is determined by the backend), 'metric' or 'imperial'.

By default this value is undefined and can be set to one of the valid values before calculating a route in order to inform the routing backend to return routes with the specified metric system.

Example:

```
//force the routing backend to use distances in the metric system
routingManager.set('metricSystem', 'metric');
```

state: {String}

This property holds the state of the request sent by the given instance of the `Manager`. The possible values are: "initial", "started", "finished", "failed" and "cleared".

Method Details

calculateRoute(waypoints, mode)

This method invokes the back-end `calculateRoute` service.

Parameters:

waypoints:	{*nokia.maps.routing.WaypointParameterList*} A list of waypoints containing start, destination, and optional via points; the list represents the basis for a route calculation
mode:	{*nokia.maps.routing.Mode*} An object that defines the mode for the routes to be calculated

clear()

This method clears all the stored routes.

www.EngineeringBooksPdf.com

destroy()

This method cleans up the given instance of routing.Manager before releasing it from memory. It is important to call this method especially when you use asynchronous code, because it kills coroutines, thus preventing errors.

getErrorCause(): {nokia.maps.routing.ServiceError}

This method returns the cause of an error.

Returns:

{nokia.maps.routing.ServiceError}

The error object containing the error type

getRoutes(): {nokia.maps.routing.Route[]}

This method retrieves routes that have been calculated by the back end.

Returns:

{nokia.maps.routing.Route[]}

The routes returned by the back end.

Interface: Maneuver

This interface is a member of ***nokia.maps.routing***.

Interface Summary

This interface defines a maneuver, which describes an action that a person needs to perform when following a route.

[*For full details, see nokia.maps.routing.Maneuver*]

Table 190: Property Summary

Properties
action: {String} Code that identifies the action for this maneuver.
baseTime: {String}

www.EngineeringBooksPdf.com

Properties

Estimated time spent on the segment following this maneuver, without considering traffic conditions, as it is based on the BaseSpeed.

direction: {String}

This property holds a maneuver direction hint.

firstPoint: {Number}

Index into the global geometry array, pointing to the first point of the shape subsegment associated with this Maneuver.

freewayExit: {String}

Name of the freeway exit to be taken at the maneuver.

freewayJunction: {String}

Name of the freeway junction for the current maneuver.

instruction: {String}

This property contains a textual instruction describing the required maneuver, for example, "Turn left onto Minna St.

lastPoint: {Number}

Index into the global geometry array, pointing to the last point of the shape subsegment associated with this Maneuver.

length: {Number}

This property holds the length of the segment following the given maneuver until the next maneuver.

nextRoadName: {String}

Name of the next road in the route that the maneuver is heading toward.

nextRoadNumber: {String}

Number of the road (such as A5, B49, etc.

position: {*nokia.maps.geo.Coordinate*}

This property holds an object containing the coordinates of the position, where the maneuver starts.

roadName: {String}

Name of the road on which the maneuver begins.

roadNumber: {String}

Number of the road where the maneuver starts (for example, A5, B49).

roadShield: {String}

Information that can be used to look up a visual representation of the road shield associated with this maneuver.

shape: {*nokia.maps.geo.Shape*}

www.EngineeringBooksPdf.com

Properties
This property holds a shape object (a polyline) that represents the route segment following the given maneuver until the next maneuver.
signPost: {String} Sign text indicating the direction a driver should follow, for example, "Flughafen Berlin-Tegel, Berlin-Zentrum, Berlin-Zehlendorf, Potsdam-Zentrum, A115"
startAngle: {Number} Start angle information for the given maneuver, measured in degrees from 0 to 359.
trafficTime: {Number} Traffic-enabled time.
travelTime: {Number} This property holds the time needed to travel the route segment following the given maneuver until the next maneuver.
type: {String} This property contains an identifier to differentiate public from private transport maneuvers.

Interface Description

This interface defines a maneuver, which describes an action that a person needs to perform when following a route. Specifically, a maneuver applies to a particular route link, which is a part of a route calculated by the back-end server, has a server-assigned identifier, and is defined as a set of instances of *nokia.maps.geo.Coordinate*.

Property Details

action: {String}

Code that identifies the action for this maneuver. Does not always indicate a direction. Possible values are:

- `depart` - departure maneuver, such as "Start at"
- `departAirport` - departure at an airport maneuver, such as "Start toward the airport exit"
- `arrive` - Identifer for an arrival maneuver., such as "Arrive at"
- `arriveAirport` - Identifer for an arrival at the airport maneuver, such as "Follow the signs to your terminal"
- `arriveLeft` - Identifer for an arrival maneuver with the destination on the left-hand side, such as "Arrive at"

www.EngineeringBooksPdf.com

- `arriveRight` - Identifer for an arrival maneuver with the destination on the right-hand side, such as "Arrive at"
- `leftLoop` - left-hand loop maneuver., such as "Make a left-hand loop onto"
- `leftUTurn` - left-hand U-turn maneuver., such as "Make a U-turn at"
- `sharpLeftTurn` - sharp left turn maneuver., such as "Make a hard left turn onto"
- `leftTurn` - left turn maneuver, such as "Turn left on"
- `slightLeftTurn` - slight left turn maneuver., such as "Bear left onto"
- `continue` - continue maneuver, such as "Continue on"
- `slightRightTurn` - slight right turn maneuver., such as "Bear right onto"
- `rightTurn` - right turn maneuver, such as "Turn right on"
- `sharpRightTurn` - sharp right turn maneuver., such as "Make a hard right turn onto"
- `rightUTurn` - right u-turn maneuver., such as "Make a right U-turn at"
- `rightLoop` - right loop maneuver, such as "Make a right-hand loop onto"
- `leftExit` - left exit maneuver, such as "Take the left exit to"
- `rightExit` - right exit maneuver, such as "Take the right exit to"
- `leftRamp` - left ramp maneuver, such as "Take the left ramp onto"
- `rightRamp` - right ramp maneuver, such as "Take the right ramp onto"
- `leftFork` - left fork maneuver, such as "Take the left fork onto"
- `middleFork` - middle fork maneuver, such as "Take the middle fork onto"
- `rightFork` - right fork maneuver, such as "Take the right fork onto"
- `leftMerge` - left merge maneuver, such as "Merge left onto"
- `rightMerge` - right merge maneuver, such as "Merge right onto"
- `nameChange` - name change maneuver (no maneuver action needed), such as "Road becomes"
- `trafficCircle` - traffic circle maneuver, such as "At the traffic circle take the exit to"
- `ferry` - ferry maneuver, such as "Take the ferry to"
- `leftRoundaboutExit1` - roundabout maneuver (left-hand traffic), such as "Take the first exit of the roundabout onto"
- `leftRoundaboutExit2` - roundabout maneuver (left-hand traffic), such as "Take the second exit of the roundabout onto"
- `leftRoundaboutExit3` - roundabout maneuver (left-hand traffic), such as "Take the third exit of the roundabout onto"
- `leftRoundaboutExit4` - roundabout maneuver (left-hand traffic), such as "Take the fourth exit of the roundabout onto"

here
www.EngineeringBooksPdf.com

- `leftRoundaboutExit5` - roundabout maneuver (left-hand traffic), such as "Take the fifth exit of the roundabout onto"
- `leftRoundaboutExit6` - roundabout maneuver (left-hand traffic), such as "Take the sixth exit of the roundabout onto"
- `leftRoundaboutExit7` - roundabout maneuver (left-hand traffic), such as "Take the 7th exit of the roundabout onto"
- `leftRoundaboutExit8` - roundabout maneuver (left-hand traffic), such as "Take the 8th exit of the roundabout onto"
- `leftRoundaboutExit9` - roundabout maneuver (left-hand traffic), such as "Take the 9th exit of the roundabout onto"
- `leftRoundaboutExit10` - roundabout maneuver (left-hand traffic), such as "Take the 10th exit of the roundabout onto"
- `leftRoundaboutExit11` - roundabout maneuver (left-hand traffic), such as "Take the 11th exit of the roundabout onto"
- `leftRoundaboutExit12` - roundabout maneuver (left-hand traffic), such as "Take the 12th exit of the roundabout onto"
- `rightRoundaboutExit1` - roundabout maneuver (right-hand traffic), such as "Take the first exit of the roundabout onto"
- `rightRoundaboutExit2` - roundabout maneuver (right-hand traffic), such as "Take the second exit of the roundabout onto"
- `rightRoundaboutExit3` - roundabout maneuver (right-hand traffic), such as "Take the third exit of the roundabout onto"
- `rightRoundaboutExit4` - roundabout maneuver (right-hand traffic), such as "Take the fourth exit of the roundabout onto"
- `rightRoundaboutExit5` - roundabout maneuver (right-hand traffic), such as "Take the fifth exit of the roundabout onto"
- `rightRoundaboutExit6` - roundabout maneuver (right-hand traffic), such as "Take the sixth exit of the roundabout onto"
- `rightRoundaboutExit7` - roundabout maneuver (right-hand traffic), such as "Take the 7th exit of the roundabout onto"
- `rightRoundaboutExit8` - roundabout maneuver (right-hand traffic), such as "Take the 8th exit of the roundabout onto"
- `rightRoundaboutExit9` - roundabout maneuver (right-hand traffic), such as "Take the 9th exit of the roundabout onto"
- `rightRoundaboutExit10` - roundabout maneuver (right-hand traffic), such as "Take the 10th exit of the roundabout onto"

www.EngineeringBooksPdf.com

- `rightRoundaboutExit11` - roundabout maneuver (right-hand traffic), such as "Take the 11th exit of the roundabout onto"
- `rightRoundaboutExit12` - roundabout maneuver (right-hand traffic), such as "Take the 12th exit of the roundabout onto"

`baseTime`: `{String}`

Estimated time spent on the segment following this maneuver, without considering traffic conditions, as it is based on the BaseSpeed. The service may also account for additional time penalties, therefore this may be greater than the link length divided by the base speed.

`direction`: `{String}`

This property holds a maneuver direction hint. The possible values are:

- `"forward"`
- `"bearRight"`
- `"lightRight"`
- `"right"`
- `"hardRight"`
- `"uTurnRight"`
- `"uTurnLeft"`
- `"hardLeft"`
- `"left"`
- `"lightLeft"`
- `"bearLeft"`

`firstPoint`: `{Number}`

Index into the global geometry array, pointing to the first point of the shape subsegment associated with this Maneuver. Must be followed by *nokia.maps.routing.Maneuver#lastPoint*.

`freewayExit`: `{String}`

Name of the freeway exit to be taken at the maneuver.

www.EngineeringBooksPdf.com

freewayJunction: {String}

Name of the freeway junction for the current maneuver.

instruction: {String}

This property contains a textual instruction describing the required maneuver, for example, "Turn left onto Minna St."

lastPoint: {Number}

Index into the global geometry array, pointing to the last point of the shape subsegment associated with this Maneuver. Must be preceded by *nokia.maps.routing.Maneuver#firstPoint*.

length: {Number}

This property holds the length of the segment following the given maneuver until the next maneuver.

nextRoadName: {String}

Name of the next road in the route that the maneuver is heading toward.

nextRoadNumber: {String}

Number of the road (such as A5, B49, etc.) towards which the maneuver is heading.

position: {*nokia.maps.geo.Coordinate*}

This property holds an object containing the coordinates of the position, where the maneuver starts.

roadName: {String}

Name of the road on which the maneuver begins.

roadNumber: {String}

Number of the road where the maneuver starts (for example, A5, B49).

www.EngineeringBooksPdf.com

roadShield: {String}

Information that can be used to look up a visual representation of the road shield associated with this maneuver.

shape: {*nokia.maps.geo.Shape*}

This property holds a shape object (a polyline) that represents the route segment following the given maneuver until the next maneuver.

signPost: {String}

Sign text indicating the direction a driver should follow, for example, "Flughafen Berlin-Tegel, Berlin-Zentrum, Berlin-Zehlendorf, Potsdam-Zentrum, A115"

startAngle: {Number}

Start angle information for the given maneuver, measured in degrees from 0 to 359. A value of 0 represents north, while a value of 90 represents east. Angles increase clockwise.

trafficTime: {Number}

Traffic-enabled time. Estimated time spent on the segment following this maneuver, based on the TrafficSpeed. The service may also account for additional time penalties, therefore this may be greater than the link length divided by the traffic speed.

travelTime: {Number}

This property holds the time needed to travel the route segment following the given maneuver until the next maneuver. The routing type determines if the value of the property takes into account traffic information.

type: {String}

This property contains an identifier to differentiate public from private transport maneuvers. Possible values are:

www.EngineeringBooksPdf.com

- `"publicTransport"`
- `"privateTransport"`

Interface: Mode

This interface is a member of ***`nokia.maps.routing`***.

Interface Summary

This interface defines route modes, types and other options applicable to route calculations.

[*For full details, see nokia.maps.routing.Mode*]

Table 191: Property Summary

Properties
`options``: {String[]} [optional]` This property specifies the routing options to be applied when calculating the route.
`trafficMode``: {String} [optional]` This property indicates if traffic information is to be considered when calculating the route.
`transportModes``: {String}` This property defines the transport mode to be used in the route calculation.
`type``: {String}` This property holds a route type applicable to the route calculation.

Interface Description

This interface defines route modes, types and other options applicable to route calculations.

Property Details

`options``: {String[]} [optional]`

This property specifies the routing options to be applied when calculating the route. The possible values are:

- `"avoidTollroad"` - indicates that the route should avoid toll roads
- `"avoidMotorway"` - indicates that the route should avoid motorways (highways)
- `"avoidBoatFerry"` - indicates that the route should avoid boat ferries
- `"avoidRailFerry"` - indicates that the route should avoid rail ferries

www.EngineeringBooksPdf.com

- "avoidPublicTransport" - indicates that the route should avoid public transport
- "avoidTunnel" - indicates that the route should avoid tunnels
- "avoidDirtRoad" - indicates that the route should avoid dirt roads
- "avoidPark" - indicates that the route should avoid parks
- "preferHOVLane" - indicates that the route should give preference to high-occupancy vehicle (HOV) lanes
- "avoidStairs" - indicates that the route should avoid stairs

trafficMode: {String} [optional]

This property indicates if traffic information is to be considered when calculating the route. The possible values are:

- "enabled" - indicates that the dynamic traffic conditions are to be taken into account (current traffic traffic patterns, short term closures, long term closures
- "disabled" - indicates that dynamic traffic conditions are not to be taken into account, but only time restrictions and seasonal closures
- "default" - indicates that the service is to apply traffic-related constraints suitable for the selected routing type, transport mode and departure time, and it is to take into consideration user entitlements automatically

transportModes: {String}

This property defines the transport mode to be used in the route calculation. The possible values are:

- "car" - indicates that the route is to be suitable for cars
- "pedestrian" - indicates that the route is for pedestrians (walking)
- "publicTransport" - indicates that the route is to be traveled using public transport

type: {String}

This property holds a route type applicable to the route calculation. The possible values are:

- "shortest" - the shortest route between the start and finish points, disregarding traffic conditions
- "fastest" - a route that allows the destination to be reached in the shortest amount of time; the travel time takes into consideration traffic information (if trafficMode is selected)

www.EngineeringBooksPdf.com

Interface: Route

This interface is a member of ***nokia.maps.routing***.

Interface Summary

This interface defines a route.

[*For full details, see nokia.maps.routing.Route*]

Table 192: Property Summary

Properties
legs: {*nokia.maps.routing.RouteLeg*[]} This property holds an array that represents the partition of the route into legs between the different waypoints.
mode: {*nokia.maps.routing.Mode*} This property holds an object that represents the route mode used in the route calculation.
shape: {*nokia.maps.geo.Shape*} This property holds a route shape object as a polyline.
summary: {*nokia.maps.routing.RouteSummary*} This property holds information about the overall route distance and time summary.
waypoints: {*nokia.maps.routing.Waypoint*[]} This property holds a list of waypoints that have been defined when requesting a route calculation.

Interface Description

This interface defines a route. A route describes a path through the route network between at least two waypoints (start and end). It is calculated by a back-end server and includes a list of route links and maneuvers. A maneuver describes an action a person needs to perform to follow a route. For example, it can contain an instruction to turn right or left or an indication of the direction of travel, etc. A maneuver applies to a route link, which is a part of a route that has a unique id (allocated by the server) and consists of a list of points/locations (defined in terms of their geographic coordinates).

Property Details

legs: {*nokia.maps.routing.RouteLeg*[]}

www.EngineeringBooksPdf.com

This property holds an array that represents the partition of the route into legs between the different waypoints.

mode: {*nokia.maps.routing.Mode*}

This property holds an object that represents the route mode used in the route calculation.

shape: {*nokia.maps.geo.Shape*}

This property holds a route shape object as a polyline. Its accuracy depends on the resolution specified in mpp (meters per pixel) when requesting the route. In some use cases (such as Web portals), only the route's shape is required, without the nested structure and detailed knowledge of the links and their ids; the shape does not need to be acquired by traversing the route's links, but can be represented using this attribute at route level.

summary: {*nokia.maps.routing.RouteSummary*}

This property holds information about the overall route distance and time summary.

waypoints: {*nokia.maps.routing.Waypoint*[]}

This property holds a list of waypoints that have been defined when requesting a route calculation. The first waypoint is defined as the start of the route; the last waypoint marks the destination. Any waypoints in between the two define "via points".

Interface: RouteLeg

This interface is a member of ***nokia.maps.routing***.

Interface Summary

This interface defines a route leg, which represents a section of a route between two consecutive waypoints.

[*For full details, see nokia.maps.routing.RouteLeg*]

www.EngineeringBooksPdf.com

Table 193: Property Summary

Properties
end: {*nokia.maps.routing.Waypoint*} This property holds an object representing the waypoint at the end of the route leg.
length: {Number} This property holds the length of the given leg of the route.
link: {String[]} List of all links which are included in this portion of the route.
maneuvers: {*nokia.maps.routing.Maneuver*[]} This property holds a list of all maneuvers which are included in this section of the route.
start: {*nokia.maps.routing.Waypoint*} This property holds an object representing the waypoint at the start of the route leg.
travelTime: {Number} This property holds the time needed to travel the length of the given route leg.

Interface Description

This interface defines a route leg, which represents a section of a route between two consecutive waypoints.

Property Details

end: {*nokia.maps.routing.Waypoint*}

This property holds an object representing the waypoint at the end of the route leg. It refers to one of the waypoints in the `Route` object, an element in `Route.waypoints`.

length: {Number}

This property holds the length of the given leg of the route.

link: {String[]}

List of all links which are included in this portion of the route.

www.EngineeringBooksPdf.com

maneuvers: {*nokia.maps.routing.Maneuver*[]}

This property holds a list of all maneuvers which are included in this section of the route.

start: {*nokia.maps.routing.Waypoint*}

This property holds an object representing the waypoint at the start of the route leg. It refers to one of the waypoints in the `Route` object, an element in `Route.waypoints`.

travelTime: {Number}

This property holds the time needed to travel the length of the given route leg. The routing type determines if this value takes into account traffic information.

Interface: RouteSummary

This interface is a member of ***nokia.maps.routing***.

Interface Summary

This interface defines a route summary.

[*For full details, see nokia.maps.routing.RouteSummary*]

Table 194: Property Summary

Properties
baseTime: {Number} This property holds the total travel time required to travel the length of the route, not considering traffic, but taking the transport mode into account.
distance: {Number} This property holds the total distance covered by the route (the distance a traveler covers by following the route from start to finish).
flags: {String[]} This property contains an array of strings that hold special criteria that specify, for example, ferry or motorway usage, and which are matched by the route.
trafficTime: {Number} This property holds the total time required to travel the length of the route, considering traffic.

www.EngineeringBooksPdf.com

Interface Description

This interface defines a route summary.

Property Details

`baseTime`: `{Number}`

This property holds the total travel time required to travel the length of the route, not considering traffic, but taking the transport mode into account.

`distance`: `{Number}`

This property holds the total distance covered by the route (the distance a traveler covers by following the route from start to finish).

`flags`: `{String[]}`

This property contains an array of strings that hold special criteria that specify, for example, ferry or motorway usage, and which are matched by the route. The possible values are:

- `"motorway"` - indicates that the link is a motorway
- `"boatFerry"` - inidcates that the link can only be traversed by using a boat ferry
- `"railFerry"` - indicates that the link can only be traversed by using a rail ferry
- `"publicTransport"` - indicates that the link can only be traversed by using public transport
- `"gatedArea"` - indicates that the link is part of a gated area
- `"privateRoad"` - indicates that the link is part of a private road
- `"tollroad"` - indicates that the link is part of a toll road
- `"station"` - indicates a public transport station

`trafficTime`: `{Number}`

This property holds the total time required to travel the length of the route, considering traffic.

Interface: ServiceError

This interface is a member of ***`nokia.maps.routing`***.

www.EngineeringBooksPdf.com

Interface Summary

This interface represents a routing service error.

[*For full details, see nokia.maps.routing.ServiceError*]

Table 195: Property Summary

Properties
message: {String} This property contains the error message with textual explanation of the error.
subtype: {String} This property holds a subtype of the service error.
type: {String} This property holds the service error type.

Interface Description

This interface represents a routing service error.

Property Details

message: {String}

This property contains the error message with textual explanation of the error.

subtype: {String}

This property holds a subtype of the service error. The possible values are:

- `"invalidInputData"` - indicates that the request contains invalid input data (wrong format, contradictory input, etc.)
- `"contractViolate"` - indicates that the contract exists for the given token, but is not yet active or has already expired
- `"permissionError"` - indicates that the access permission for the given token has been denied by the service
- `"exceededUsageLimit"` - indicates that the usage limit as given in the user's contract associated with the given token has been reached
- `"invalidCredentials"` - indicates that the specified token was invalid or no contract could be found for this token

www.EngineeringBooksPdf.com

- `"insufficientRights"` - indicates that the user's contract exists for the given token, but a required entitlement is missing
- `"networkAccessDenied"` - indicates that network access to the requested resource has been denied
- `"serviceNotAvailable"` - indicates that the service is not available (server down, resource not found, etc.)
- `"timeout"` - indicates that a timeout occurred
- `"noRouteFound"` - indicates that no route could be constructed based on the input parameter(s)
- `"waypointNotFound"` - indicates that one of the requested way points (start/end or a via point) could not be found in the routing network
- `"linkIdNotFound"` - indicates that a link id passed as input parameter could not be found in the underlying map data
- `"invalidRouteId"` - indicates that the route could not be reconstructed based on the given route id
- `"positionOffRoute"` - indicates that the specified position is too far away from the route; a position is considered to be off the route if it lies 500m or more away from it

`type`: `{String}`

This property holds the service error type. The possible values are:

- `"applicationError"` - indicates an error, which was thrown because the business logic has detected some error
- `"systemError"` - indicates an error, which was thrown due to technical reasons
- `"permissionError"` - indicates an error, which was thrown due to invalid credentials or missing entitlements

Interface: Waypoint

This interface is a member of ***`nokia.maps.routing`***.

Interface Summary

This interface defines a waypoint, which is a point along a route explicitly specified as part of route definition as a location through which the route must pass.

[*For full details, see nokia.maps.routing.Waypoint*]

www.EngineeringBooksPdf.com

Table 196: Property Summary

Properties
label: {String} A label identifying this waypoint, generated by the routing service.
linkId: {String} ID of the link on the navigable network associated with the waypoint.
mappedPosition: {*nokia.maps.geo.Coordinate*} This property holds an object containing the geographical coordinates of the nearest point on the link (route) to the original position specified as part of the route calculation request (the position of the waypoint on the calculated route).
mappedRoadName: {String} Displays the name of the street to which the request waypoint was mapped.
originalPosition: {*nokia.maps.geo.Coordinate*} This property holds an object containing the geographical coordinates of the position of the waypoint as it was originally specified in the route calculation request.
shapeIndex: {Number} Specifies the index of this waypoint, based on the global shape array that is provided at the route level.
sideOfStreet: {String} Indicates whether the waypoint is on the left or right side of the link, when heading from the reference node to the non-reference node.
spot: {Number} Contains the relative position of the mapped location along the link, as the fractional distance between the link's reference node and the non-reference node.
stopId: {String} The DiscoverCities StopId of the Public Transport Stop as specified in the corresponding request.
type: {String} Defines the type of the waypoint, either `stopOver` or `passThrough`.
userLabel: {String} Used to identify a waypoint point with a custom name.

Interface Description

This interface defines a waypoint, which is a point along a route explicitly specified as part of route definition as a location through which the route must pass. A waypoint can correspond to a route

www.EngineeringBooksPdf.com

link position (nokia.maps.advrouting.LinkPosition) or it can be the result of map matching. In the first case, the attribute `mappedPosition` is not filled.

Property Details

`label`: {String}

A label identifying this waypoint, generated by the routing service. Label is either a street name or a public transport stop, depending on the transport mode of the request.

`linkId`: {String}

ID of the link on the navigable network associated with the waypoint.

`mappedPosition`: {*nokia.maps.geo.Coordinate*}

This property holds an object containing the geographical coordinates of the nearest point on the link (route) to the original position specified as part of the route calculation request (the position of the waypoint on the calculated route).

`mappedRoadName`: {String}

Displays the name of the street to which the request waypoint was mapped.

`originalPosition`: {*nokia.maps.geo.Coordinate*}

This property holds an object containing the geographical coordinates of the position of the waypoint as it was originally specified in the route calculation request.

`shapeIndex`: {Number}

Specifies the index of this waypoint, based on the global shape array that is provided at the route level.

`sideOfStreet`: {String}

Indicates whether the waypoint is on the left or right side of the link, when heading from the reference node to the non-reference node.

www.EngineeringBooksPdf.com

spot: {Number}

Contains the relative position of the mapped location along the link, as the fractional distance between the link's reference node and the non-reference node. Ranges in value from 0 to 1.

stopId: {String}

The DiscoverCities StopId of the Public Transport Stop as specified in the corresponding request.

type: {String}

Defines the type of the waypoint, either `stopOver` or `passThrough`.

userLabel: {String}

Used to identify a waypoint point with a custom name. Copied verbatim as specified in the request.

Class: WaypointParameterList

This class is a member of ***nokia.maps.routing***.

Class Summary

This class represents a list of waypoints that may be defined by instances of various location classes.

[*For full details, see nokia.maps.routing.WaypointParameterList*]

Table 197: Method Summary

Methods
addCoordinate (coord) This method adds an object containing geographical coordinates to the given instance of `WaypointParameterList`.
clear () This method clears the given instance of the waypoint parameter list.
size () : {Number} This method retreives the size of the given instance of the waypoint parameter list.
toCoordinates () : {*nokia.maps.geo.Coordinate*[]}

www.EngineeringBooksPdf.com

Methods
This method converts the given instance of the `WaypontParameterList` to an array of instances of *nokia.maps.geo.Coordinate*.

Class Description

This class represents a list of waypoints that may be defined by instances of various location classes. Thus a waypoint may be specified, using an instance of *nokia.maps.geo.Coordinate*, nokia.maps.search.Place or nokia.maps.search.Location.

Constructor Details

`nokia.maps.routing.WaypointParameterList()`

This method initializes an instance of `WaypointParameterList` that contains a list of waypoints with potentially different representations.

Method Details

`addCoordinate(coord)`

This method adds an object containing geographical coordinates to the given instance of `WaypointParameterList`.

Parameters:

`coord:`	{*nokia.maps.geo.Coordinate*} An object containing the geographical coordinates of a location

`clear()`

This method clears the given instance of the waypoint parameter list.

`size(): {Number}`

This method retreives the size of the given instance of the waypoint parameter list.

Returns:

`{Number}`	A numeric value representing the number of waypoint parameters in the list

www.EngineeringBooksPdf.com

toCoordinates(): {*nokia.maps.geo.Coordinate*[]}

This method converts the given instance of the `WaypontParameterList` to an array of instances of *nokia.maps.geo.Coordinate*.

Returns:

{*nokia.maps.geo.Coordinate*[]}

An array of latitude-longitude objects

Namespace: component

This namespace is a member of ***nokia.maps.routing***.

Namespace Summary

This namespace defines facilities that add interactive behavior to routes displayed on the map.

Namespace Description

This namespace defines facilities that add interactive behavior to routes displayed on the map.

Class: RouteResultSet

This class is a member of ***nokia.maps.routing.component***.

Class Summary

This class represents a route calculation result set.

[*For full details, see nokia.maps.routing.component.RouteResultSet*]

Class Description

This class represents a route calculation result set. It can be initiated with a response from a route calculation request and provides methods to handle this response in combination with a map.

Constructor Details

nokia.maps.routing.component.RouteResultSet(routedata, settings)

www.EngineeringBooksPdf.com

The constructor initializes an instance of `RouteResultSet` on the basis of the arguments supplied by the caller. A new instance can be created, using a response to a route calculation request.

Parameters:

`routedata`: {*`nokia.maps.routing.Route`*}

The route data which represent the results of a route calculation

`settings`: {`Object`}

An optional hash object specifying settings to be used when drawing a route; the possible attributes are as defined under *nokia.maps.map.Polyline.Properties* and include:

- `"pen"` - an object that defines the properties of a polyline drawn on the map (see also *nokia.maps.util.Pen*)
- `"arrows"` - an object that defines the properties of arrows drawn on the map (see also *nokia.maps.util.Arrows*)

Namespace: util

This namespace is a member of ***`nokia.maps`***.

Namespace Summary

This namespace defines utility classes and interfaces used in other namespaces in this API to support map objects, animations and graphics.

Namespace Description

This namespace defines utility classes and interfaces used in other namespaces in this API to support map objects, animations and graphics.

Class: Arrows

This class is a member of ***`nokia.maps.util`***.

Class Summary

This class defines the properties of arrows, used when stroking map polylines (routes) with arrows to indicate the direction of travel.

www.EngineeringBooksPdf.com

[*For full details, see nokia.maps.util.Arrows*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.util.IArrows* :

color, *frequency*, *length*, *width*

Class Description

This class defines the properties of arrows, used when stroking map polylines (routes) with arrows to indicate the direction of travel.

Constructor Details

`nokia.maps.util.Arrows``(props)`

This method initializes an instance of `Arrows`. Note that if the caller does not provide the initial property values, the method uses defaults.

Parameters:

`props`: {*`nokia.maps.util.IArrows`*}

A JavaScript object containing the initial values of the `Arrows` properties, for example, `{"frequency": 4, "length": 2.3, "width": 1.0, "color": "#FFFC"}`

Class: Brush

This class is a member of ***`nokia.maps.util`***.

Class Summary

This class defines the properties of brush objects that can be used when filling map shapes with color.

[*For full details, see nokia.maps.util.Brush*]

Property Summary

Directly Inherited Properties

www.EngineeringBooksPdf.com

Inherited from class *nokia.maps.util.IBrush* :

color, *fill*

Class Description

This class defines the properties of brush objects that can be used when filling map shapes with color.

Constructor Details

`nokia.maps.util.Brush``(props, brush)`

This method initializes an instance of `Brush`. Note that if the caller does not provide initial property values, the method uses defaults.

Parameters:

`props`:	{*`nokia.maps.util.IBrush`*}
	The initial values of the `Brush` properties as a JavaScript object
`brush`:	{*`nokia.maps.util.Brush`*} [optional]
	If provided, this object is copied to create a new instance of the class

Class: Cache

This class is a member of ***`nokia.maps.util`***.

Class Summary

A cascadable LRU-Cache (Least Recently Used).

[*For full details, see nokia.maps.util.Cache*]

Table 198: Property Summary

Properties
change :
A method whose return value should be returned by addFilter function to signal "The entry data has been changed by addFilter".
`static` ***change*** :

www.EngineeringBooksPdf.com

Properties
A method whose return value should be returned by addFilter function to signal "The entry data has been changed by addFilter".
`static constant DONT: {Object}`
The value to return by addFilter function to signal "The entry should not be added".
`static constant NEXT: {Object}`
The value to return by addFilter function to signal "The entry should be added in next level if possible".
`static constant NOT_ENOUGH_SPACE: {Object}`
A return value of *nokia.maps.util.Cache#add* to signal that the cache can't store the data because there is not enough space to store the data.

Table 199: Method Summary

Methods
`add (id, data, size) : {Object | undefined}`
To add an entry to the cache.
`destroy ()`
To clean up the cache on shut down.
`get (id, noUpdate) : {Variant}`
To get a possibly cached entry.
`remove (id, nonRecursive) : {Variant}`
To remove a possibly existing entry from cache.
`removeAll (idPrefix)`
To remove all cache entries which starts with the given id prefix.

Class Description

A cascadable LRU-Cache (Least Recently Used). Each cache level is configurable by it's size plus optional addFilter and an onDrop callback.

Constructor Details

`nokia.maps.util.Cache``(size, addFilter, onDrop, nextCache)`

Parameters:

www.EngineeringBooksPdf.com

`size`: `{Number}` [optional, default: 1]

The maximum size of this this cache for all entry data. The size must be a number between 0...Infinity. See also *nokia.maps.util.Cache#add* size argument.

`addFilter`: `{Function}` [optional]

A filter to use when a cache entry should be added via add(). If the addFilter argument is omitted the original data will be stored. This function will get the data of the cache entry to add as argument. It has to return one of the following values:

- *nokia.maps.util.Cache.DONT* to signal that the entry should not be added and possibly existing entries should be removed.
- *nokia.maps.util.Cache.NEXT* to signal that the entry should be added in next cache level.
- The return value of *nokia.maps.util.Cache.change* to signal that the entry has been changed.

`onDrop`: `{Function}` [optional]

A call-back which will be triggered if a cache entry dropped out on the last level. This function will get the data of the dropped cache entry as argument. This call-back can be used to clean-up cache entry data.

`nextCache`: `{`*`nokia.maps.util.Cache`*`}` [optional]

A cache which will used as next level. Least recently used entries of this cache will automatically moved the the nextCache when the maximum size of this cache is reached. If omitted the least recently used entry will be dropped instead.

Property Details

change :

A method whose return value should be returned by addFilter function to signal "The entry data has been changed by addFilter".

`static` change :

www.EngineeringBooksPdf.com

A method whose return value should be returned by addFilter function to signal "The entry data has been changed by addFilter".

`static constant DONT: {Object}`

The value to return by addFilter function to signal "The entry should not be added".

`static constant NEXT: {Object}`

The value to return by addFilter function to signal "The entry should be added in next level if possible".

`static constant NOT_ENOUGH_SPACE: {Object}`

A return value of *nokia.maps.util.Cache#add* to signal that the cache can't store the data because there is not enough space to store the data.

Method Details

`add(id, data, size): {Object | undefined}`

To add an entry to the cache.

Parameters:

`id:`	`{String}` The ID of the entry to add.
`data:`	`{Variant}` The data of the entry to cache.
`size:`	`{Number}` [optional, default: 1] The size of the data. If omitted or undefined the default value will be taken. See also *nokia.maps.util.Cache#add* size argument. It's recommended to use a rough estimation of the data size in byte. As an example: a string has a size of 2 * length (16 bit UniCode), a IMG has a size of width * height * 4 (RGBA), a number has a size of 8 Byte (IEEE double) etc.pp.

www.EngineeringBooksPdf.com

Returns:

{Object | undefined}	the status of the add operation. The return value could be one of: • undefined - if the entry was added to the cache • *nokia.maps.util.Cache.NEXT* if the entry could not added because a addFilter has signaled "NEXT" but there is no next cache level. • *nokia.maps.util.Cache.DONT* if the entry could not added because a addFilter has signaled "DONT".

destroy()

To clean up the cache on shut down.

get(id, noUpdate): {Variant}

To get a possibly cached entry.

Parameters:

id:	{String} The ID of the requested cache entry.
noUpdate:	{Boolean} [optional, default: false] A flag to signal that the cache should not be updated so that the requested entry will be not the "most recently used" entry.

Returns:

{Variant}	the data of the cached entry or undefined if not found.

remove(id, nonRecursive): {Variant}

To remove a possibly existing entry from cache.

Parameters:

id:	{String}

www.EngineeringBooksPdf.com

	The ID of the entry to remove.
nonRecursive:	{Boolean} [optional, default: false]
	A flag to signal that the entry should NOT removed recursive in next cache levels.

Returns:

{Variant}	The data of the removed entry or undefined if not found.

removeAll(idPrefix)

To remove all cache entries which starts with the given id prefix.

Parameters:

idPrefix:	{String}
	The ID prefix of the entries to remove.

Example:

```
myCache.removeAll(myProvider.id); // remove all cache entries whose ID
starts with the ID of myProvider
```

Class: Coroutine

This class is a member of ***nokia.maps.util***.

Class Summary

This class represents a coroutine that guarantees code execution in a non-blocking way.

[*For full details, see nokia.maps.util.Coroutine*]

Table 200: Property Summary

Properties
static ***AF_MAX_EXEC_TIME***: {Number}
This property holds the maximal execution time for those coroutine being executed within the animation frame request (see *nokia.maps.util.Coroutine.ExecutionContext#useAnimationFrame* and nokia.maps.util.Coroutine#MAX_EXEC_TIME for details.

www.EngineeringBooksPdf.com

Properties
`static` ***AF_SLICE_SIZE***: {Number} This property holds the maximal size of each time slice for a coroutine being executed within the animation frame request (see *nokia.maps.util.Coroutine.ExecutionContext#useAnimationFrame* and nokia.maps.util.Coroutine#SLICE_SIZE for details.
`static constant` ***BLOCKED***: {Object} This property holds a special object returned by the `sleep()`, `wait()` and `suspend()` methods.
`static constant` ***BLOCKING***: {Number} Coroutine status constant indicating that a context is blocked at a condition or sleeping.
`static constant` ***KILLED***: {Object} This property holds a special object returned by the `kill()` method.
`static` ***MAX_EXEC_TIME***: {Number} This property holds the maximum execution time or the number of milliseconds consumed by coroutines before control is handed over to the browser and so to other JavaScript code.
`static constant` ***RUNNING***: {Number} Coroutine status constant indicating that a context is currently running.
`static` ***SLICE_SIZE***: {Number} This property holds the maximum size of each time slice for a coroutine.
`static constant` ***TERMINATED***: {Number} Coroutine status constant indicating that a context is terminated.
`static constant` ***YIELDED***: {Object} This property holds a special object returned by the `yield()` method.

Table 201: Method Summary

Methods
`static` ***all*** `()` : {*nokia.maps.util.Coroutine.ExecutionContext*[]} This method returns an array with all the execution contexts currently marked as "running" or "blocking".
`static` ***broadcast*** `(obj)` This method signals all coroutines blocking on an object and resumes them.
`static` ***catchException*** `(enable)` This method enables exception catching in the scheduler to ignore errors in coroutines or it can be used to disable exception catching for debugging purposes.
`static` ***count*** `()` : {Number}

www.EngineeringBooksPdf.com

Methods

This method retrieves the number of contexts not being terminated, thus the return value includes all running and blocked contexts.

`static` ***create*** `(name, fn, args) : {Function}`

This method creates a new coroutine, using the name and implementation supplied by the caller.

`static` ***createEx*** `(name, fn, defaults, args) : {Function}`

This method creates a new coroutine using the name and implementation supplied by the caller.

`static` ***current*** `() : {nokia.maps.util.Coroutine.ExecutionContext}`

This method returns the currently executed context or `null` if no context is executed right now.

`static` ***forId*** `(id) : {nokia.maps.util.Coroutine.ExecutionContext}`

This method retrieves the execution context with the given id or `undefined` if no such context exists.

`static` ***forName*** `(name) : {nokia.maps.util.Coroutine.ExecutionContext[]}`

This method searches through the list of all contexts currently in the "running" or "blocking" state and returns all those that are bound to the coroutine with the name supplied by the caller.

`static` ***kill*** `(context, reason) : {Object}`

This method immediately terminates the currently executed coroutine or the supplied coroutine context.

`static` ***killAll*** `()`

This method destroys all execution contexts currently in the "running" or "blocking" state.

`static` ***resume*** `(context)`

This method resumes the supplied executed execution context.

`static` ***scheduler*** `(isTestUnitCall)`

This method forces the scheduler to run at once.

`static` ***schedulerCpuTime*** `() : {Number}`

This method retrieves the total CPU time that the scheduler itself has consumed.

`static` ***schedulerNextRuntime*** `() : {Number}`

This method retrieves the UNIX timestamp showing when the scheduler should run again.

`static` ***scope*** `(fn)`

This method clones the given function and moves the clone into the internal scope of the coroutine scheduler, removing the original scope remembered by the function.

`static` ***shallYield*** `() : {Boolean}`

This method checks if the currently executed coroutine context must yield or not.

`static` ***signal*** `(obj) : {nokia.maps.util.Coroutine.ExecutionContext}`

www.EngineeringBooksPdf.com

Methods
This method signals the given object and resumes the next coroutine that is blocked on this object, if any.
`static` ***sleep*** `(timeout, context) : {Object}` This method puts a coroutine context to sleep.
`static` ***suspend*** `(context, timeout) : {Object}` The method suspends the supplied execution context or the currently executed context.
`static` ***taskCpuTime*** `() : {Number}` This method retrieves the total CPU time that all contexts have consumed.
`static` ***totalCpuTime*** `() : {Number}` This method retrieves the number of milliseconds since the scheduler was started.
`static` ***wait*** `(obj, timeout, context) : {Object}` This method blocks the a coroutine on the object provided by the caller.
`static` ***yield*** `(context) : {Object}` This method makes the currently executed coroutine or the supplied one yield.

Class Description

There are many different ways to run code in a non-blocking way. The most common is to use threads which are parallel execution paths. Threads can be cooperative or preemptive. In a cooperative threading design, each thread or process is in full control of the CPU and must explicitly release the CPU so that another thread or process can take control of the CPU. In preemptive threading, a scheduler takes away the CPU from a thread and allocates it to another thread, therefore the thread has little or no control over when it is runs and on which CPU.

Preemptive versus cooperative threading

Each of the two threading models has certain advantages and disadvantages. Cooperative threading is much simpler for developers, because access control is not required. It guarantees that the memory (and so variables) and all other resources are only accessed by the currently executing code. It is not possible for one instruction to modify a variable, while another tries to read it or (worse) modify it too, therefore it impossible to access a value that is in a "half updated" state. This means that in cooperative threading there is no need for mutexes to synchronize access to memory (variables). Another advantage is performance. Because no synchronization is required, cooperative threading can be implemented more simply and a thread switch is much cheaper then in a preemptive environment.

www.EngineeringBooksPdf.com

However, the disadvantage of cooperative threading is that each process can only use one processor, because otherwise mutexes would become necessary, as each variable could be modified by one thread, while another is reading it (or even worse, both could be modifying the same object at the same time, possibly leaving the object in an unusable state). Therefore true parallel execution within one process is not possible. The other disadvantage is that a bug in the code may block the application, making it unresponsive. In extreme cases, it may block the entire operating system, making it unresponsive, because the thread executing the faulty code does not release the CPU.

JavaScript execution

All JavaScript code is executed in an execution context. Whenever some JavaScript code is executed, a new execution context is created. An execution context is an abstract collection that contains an activation and a variable object (as well internal information). These objects contain all the arguments supplied to a function and all the variables declared within the code, using the `var` statement. Because in reality the activation and variable objects are the same object, we simply use the term *variable object* to refer to both of them from here on. If an argument is named, its value is referenced in the *variable object* using that name; if a named argument is not supplied, a variable with the name of the argument exists in the *variable object*, but has the value `undefined` (the variable declared, but its value is `undefined`). This is important, because assigning a value to it does not lead to pollution of the global scope.

The scope chain

For any JavaScript code to be executed, there must be a global execution context in which this code can be run. In a browser environment, the browser creates such a global execution context and fills the *variable object* of that global context with some default values, for example it sets `document`, `navigator` or `Math`. The *variable object* in this global context contains a reference to the global context (`window`), which is helpful in modifying the global scope. So every browser window has its own global execution context, where the *variable object* of the global context can be accessed via the `window` variable.

To resolve a variable name to a value, the JavaScript interpreter needs to look up the variable name in the so-called *scope chain*. A newly created function "remembers" the current execution context. Every time the function is called, the interpreter creates a new execution context and assigns the previous execution context as the parent of the new context, thus building the *scope chain*. If the JavaScript interpreter has to resolve a variable named "foo", it first searches in the *variable object* of the current execution context, which is the local context for the function. If no variable with that name is found there, the interpreter searches the parent execution context, then its parent, and so on, going up the chain until it reaches the global execution context (which has no parent). In short, the *scope chain* of a function is established at function create time and each subsequent call to the function adds a new element to that chain.

www.EngineeringBooksPdf.com

This is different for the `eval` statement, because `eval` executes the code that is passed to it in the current execution context. Therefore a variable declared within an `eval` statement with the `var` keyword extends the current execution context.

The following example shows the impact of this:

```
// Create new variables within the variable object
// of the current execution context.
//
var x = 1;
var y = 99;

// Create a new function -- it remembers the current execution
// context as its scope chain. The code is discussed below.
//
var alertX = function () {
 alert("x: "+x+", y: "+y);
 var y;
};

// Calling the function creates a new execution context with
// a new variable object, the parent execution context of this new
// execution context is set to the execution context that was
// remembered at the create time of the function.
//
// The interesting thing at this point is the output:
//
//  "x: 1, y: undefined"
//
// The reason is that the new execution context contains a variable
// declaration for "y", but no value is assigned to it, while
// the only definition for "x" is in the parent context, and "x" is
// assigned a value there.
//
alertX();

// eval() is slow and should be avoided. The
// interpreter must evaluate the code passed to eval()
// within the current execution context, so the declaration of the
// variable "x" in that code has no effect, because "x" is already
// declared in the variable object of the previous execution context.
// Assigning 2 to "x" now modifies the "x" in the current execution
// context, therefore the following code causes alert()
// to display "2" twice.
//
eval("var x = 2; alert(x);");
alert(x);

// The following example demonstrates that the execution context is
remembered
// at function create time. The example creates an anonymous function,
// remembers the current execution context and then directly calls
// the new function. The function call causes a new execution context to be
// created with the parent execution context set to the current
```

www.EngineeringBooksPdf.com

```
// execution context (note that create and call time of the function are
// the same now).
//
(function () {
 // The code below causes the variable with the name "x" to be declared
 // in the variable object of the current execution context. Therefore
 // the variable of parent context with the same name is no longer
 // accessible from within the function.
 //
 var x = 3;

 // However, the call to the function alertX() below, creates a new
execution
 // context with a new variable object, and assigns as the parent execution
 // context the execution context current at the time of the call. The
code
 // within alertX() cannot find a variable with the name "x" in its own
variable
 // object. It then searches its parent execution context (not the current
 // execution context, where it would find "x" set to 3). In the parent
context,
 // "x" has the value of 2. Thus, the following line outputs "2" and not
"3":
 //
 alertX();

 // Below, we create a new function. It is created there and then,
therefore it
 // remembers the current execution context. Note that it contains the same
 // code that the alertX() function.
 //
 var fn = function () {
  alert("x: "+x+", y: "+y);
  var y;
 };

 // So when we call this function, a new execution context is created
 // and the execution context remembered at the create time of the function
 // is assigned as the parent execution context. Because the create time
 // of this function is just one line above, it is the current execution
 // context. So the interpreter searches for "x" in the variable object
 // of the new execution context, not fails to find it and then searches
the parent
 // execution context, which is the current execution context that contains
 // a variable with the name "x" and the value "3". Therefore this
 // time, the output is "3" and not "2".
 //
 fn();
})();
```

Threading

The above-described *scope chain* explains why every execution context is bound to exactly one thread and every execution context must be bound to the thread to which its parent execution context is bound. For this reason, multi-threading is not possible in JavaScript and this is also why

www.EngineeringBooksPdf.com

web-workers (the threads of HTML 5) do not have access to variables of the current window or to the DOM tree of the Web page. Every web-worker has its own global execution context and the execution context of a web-worker does not contain a reference to any window. That is also the reason why web-workers can only communicate using strings. Strings are immutable (read-only) and therefore there is no need to synchronize access to strings.

Most browsers use the same thread to render the UI, to parse the DOM tree and to execute JavaScript. Therefore as long as JavaScript is executed, no rendering of the UI or Web pages occurs, but note that this does not apply to all browsers. In any case, a buggy JavaScript code may block the browser and therefore all browser vendors implement some way to detect if JavaScript is blocking to prevent the browser becoming unresponsive to the user. For example, the Internet Explorer stops processing JavaScript after a certain number of instructions have been processed (by default around 5 million) and informs the user that a script is making the browser unresponsive, asking the user to continue the script or to abort it. Other browsers, for example Firefox, make the message conditional on elapsed execution time rather than a number of instructions.

Why you should use a coroutine and not setTimeout()

It can happen (and within this API it happens often) that some code must run for a number of seconds and/or more than 5 million instructions must be executed to perform a specific action. This happens, for example in map rendering to process huge polylines or a large number of polylines/polygons. Even though this does not always force an alert box of the browser to pop up, it makes the browser slow and unresponsive to the user input for as long as the JavaScript code runs. This situation may last a second or longer and it may occur multiple times in a row. Note that the performance of a browser is heavily dependent on the device on which the browser is running. Browsers do not have any built-in support for these cases, the function `setTimeout()` by itself does not help, because it does not take into account which function consumes how much processor time and so does not help the developer keep the browser responsive. It is possible to implement a function with a mechanism that prevents the browser becoming unresponsive, but problems are likely to arise if two or more such function run concurrently without any knowledge of one another. This API offers the *nokia.maps.util.Coroutine* class as a safe solution.

Support for coroutines

As a user of this API you can create your own coroutines. The API implements a scheduler (*nokia.maps.util.Coroutine.scheduler*) which keeps track of how much CPU time each coroutine consumes, ensuring that 80% of the available CPU time (so of the time not consumed by other JavaScript libraries) is distributed to all running coroutines, leaving approximately 20% of the free CPU time to the browser itself for rendering and event processing. The API assists the developer in writing coroutines by offering functions that help coroutines release CPU at the right moment and the API helps in saving or restoring the state of a coroutine. However, that still leaves some work to be done by the developer of a coroutine.

www.EngineeringBooksPdf.com

Scheduler details

The scheduler ensures that each coroutine receives time to execute without consuming all available CPU time, so that there is enough time left for the browser to render the Web page(s), the UI and to process user input and to execute other JavaScript code. The scheduler implements the above-described design in software. Therefore the scheduler contains a global execution context. Whenever a new coroutine is created, the current execution context is "remembered" with the coroutine, and whenever a coroutine is called, a new execution context is created and its parent execution context it set to the execution context "remembered" with the coroutine at create time. The scheduler itself supports automatic priority management. So coroutines consuming a lot of CPU time are degraded while those not consuming any CPU time are upgraded. This ensures that coroutines consuming only a small amount of CPU time (for example those handling user input processing) are not delayed by coroutines consuming large amounts of CPU time (for example rendering jobs). The major advantage of the coroutines can be seen on mobile devices which have much less CPU power then desktop PCs.

Introduction to coroutines

Not every function can become a coroutine and a coroutine is not a normal function. As already mentioned, coroutines are cooperative, therefore there is no need for mutexes. A coroutine appears as if it were executed directly when it is called. A coroutine has to call the method `shallYield()` from time to time to check if it is time to release the CPU. If the `shallYield()` returns `true`, the coroutine must call the method `yield()` and return to the caller. Calling `yield()` signals the scheduler that the function is not finished, but wants to give way to some other code. Some time later, the scheduler calls the coroutine again to allow it to continue its work.

Because of this, coroutines must remember their state and execution position between calls. A coroutine can store variables including information about the current point of execution with the *variable object*. Additionally, it is possible for one coroutine to call another coroutine and then wait for the called coroutine to finish (otherwise both coroutines would execute in parallel). Note that it is also possible that a coroutine may not end at all, so that it is executed in an endless loop, for example, rendering functions do not stop unless the *nokia.maps.map.Display* class to which they belong is destroyed; instead, they just go to sleep if there is nothing for them to do.

The possible states of the execution context of a coroutine are:

- `terminated` - the coroutine is finished
- `running` - the coroutine is currently running, but this execution context is not necessarily being executed; multiple execution contexts can be marked as "running", but in fact, they can only run one after another in succession (see *nokia.maps.util.Coroutine.current*)
- `blocking` - the coroutine is waiting for something, either waiting for a coroutine it has called or just sleeping for a moment

Simple coroutine examples

www.EngineeringBooksPdf.com

The following example shows a very simple coroutine that increments a counter and another coroutine that updates a div-tag with the current value of the counter:

```
// A shortcut for easier access to the coroutine class:
//
var Coroutine = nokia.maps.util.Coroutine;


// Create a new coroutine with the name "counter". It receives two
// arguments, the variable object and the execution context.
//
var counterCo = Coroutine.create("counterCo", function (scope, context) {
 // The following check is important, because if the parent
 // context contains a variable "counter" a simple check for
 // scope.counter would return true (scope chain) and then
 // using the counter of the parent context might lead to
 // errors.
 //
 if (!scope.has("counter")) scope.counter = 0;

 // Loop until counter reaches 1 million.
 //
 while (scope.counter < 1*1000*1000) {
  // Increment the counter.
  //
  scope.counter++;

  // If we shall yield now, do that.
  //
  if (Coroutine.shallYield()) return Coroutine.yield();
 }
});

// Now let's run an instance of the coroutine.
//
var counterCoCtx = counterCo();

// Create another coroutine to be used as render coroutine. This method
// receives as the first argument a reference to the counter coroutine
// execution context it is to track and to the div-tag into which the state
// of the counter is to be rendered.
var renderCo = Coroutine.create("renderCo", function (scope, context) {
 while (true) {
  // Output the current counter by accessing the variable
  // object of the counter coroutine and reading the value.
  //
  scope.div.innerHTML = "Current count is
"+scope.counterCoCtx.scope.counter;

  // If the counter context is terminated, we terminate too.
  //
  if (scope.counterCoCtx.status === Coroutine.TERMINATED) break;

  // Otherwise put this coroutine to sleep for 10ms and then return.
```

www.EngineeringBooksPdf.com

```
  return Coroutine.sleep(10);
 };
},
// "counterCoCtx" is bound to the first parameter of the coroutine,
// the variable "div" to the second parameter.
//
"counterCoCtx", "div");

// Call the rendering coroutine for two different div-tags, but
// the same counter.
//
var renderAContext = renderCo(counterCoCtx,
document.getElementById("outputA"));
var renderBContext = renderCo(counterCoCtx,
document.getElementById("outputB"));
```

This was a very simple example of how to write coroutines. The whole concept becomes much more complex if one coroutine needs to invoke another coroutine or if it is necessary to wait until a coroutine has calculated a return value. As you can see, each coroutine receives the reference to the *variable object*. This does not mean that it is not possible to use local variables, but it should be taken into account that the state of the real local variables cannot be saved between two calls to a coroutine and therefore they must be used with caution.

Complex coroutines

The example below shows a much more complex coroutine, where one coroutine calls another and waits until the called coroutine is finished before using the return value from the called coroutine.

```
// A shortcut to access the static coroutine class more easily.
//
var Coroutine = nokia.maps.util.Coroutine;

// Create a function that adds all numbers from "from" to "to" and returns
// the sum (and yes, we are aware that there are better ways to do it).
//
var addFromToCo = Coroutine.create("addFromToCo", function (scope) {
 // If the "sum" variable is not yet defined, initialize it with 0.
 //
 if (!scope.has("sum")) scope.sum = 0;

 // Loop until we've added all values.
 while (scope.from <= scope.to) {
  // Add the value of "from" to our "sum".
  //
  scope.sum += scope.from++;

  // If we are to release the CPU, do it.
  if (Coroutine.shallYield()) return Coroutine.yield();
 }

 // If we're finished, return the calculated sum.
 return scope.sum;
}, "from", "to");
```

www.EngineeringBooksPdf.com

```
// Create another coroutine to add a number from "a" to "b" "n" times.
//
var addMultiCo = Coroutine.create("addMultiCo", function (scope) {
 // In this case, everything gets a bit more complicated and we
 // have not only to remember some state variables, but also
 // the current execution point of the method (which we call "ip"
 // -- short for "instruction pointer") when the function is
 // called for the first time

 // When the method is called for the first time, the variable "sum"
 // contains the calculated sum, "i" contains the counter to count to
 // "n", and "addFromToCo" is a reference to an instance of the coroutine
 // that calculates the sum from "a" to "b".
 //
 if (!scope.has("ip")) {
  scope.sum = 0;
  scope.i = 0;
  scope.ip = 1;
 }

 // Now let's run a loop from "i" to "n".
 //
 while (scope.i < scope.n) {
  // If the current instruction pointer is 1, we have to call
  // the "addFromTo" coroutine now
  //
  if (scope.ip===1) {
   // and then the instruction pointer is 2.
   //
   scope.addFromToCtx = addFromToCo(scope.a, scope.b);
   scope.ip = 2;
  }

  // If the instruction pointer is currently 2
  //
  if (scope.ip===2) {
   // but the "addFromTo" coroutine is not yet finished
   //
   if (scope.addFromToCtx.status !== Coroutine.TERMINATED) {
    // We have to wait until the "addFromTo" coroutine
    // has finished processing. Therefore the "wait" call
    // lets us wait until the coroutine fires a
    // notify or broadcast to all blocking coroutines,
    // which automatically happens if the coroutine is
    // terminated for whatever reason.
    //
    return Coroutine.wait(scope.addFromToCtx);
   }

   // If we've reached this point the coroutine "addFromTo" has
   // been called and is finished, therefore we can read the returned
   // value (which is a sum) and add it to the sum variable.
   //
   scope.sum += scope.addFromToCtx.returnValue;
```

www.EngineeringBooksPdf.com

```
    // Now let's increase the loop counter and reset the instruction
    // pointer to 1, so that the "addFromTo" coroutine is called
    // again in the next loop iteration.
    scope.i++;
    scope.ip = 1;
   }
  }

  // If we reach this point, the variable "i" has reached "n" and we're
  // finished, so let's return the calculated sum.
  //
  return scope.sum;
}, "a", "b", "n");

// Let's call the "addMulti" coroutine to add the numbers from 1 to 1000
and
// this 1000 times. Wait until the coroutine is finished by registering an
// observer for the "status" property of the execution context.
//
addMultiCo(1, 1000, 1000).addObserver(
 "returnValue",
 function (context, key, value, oldValue) {
  alert(context.returnValue);
 }
);
```

This example should make one thing clear: It is very easy to use coroutines for a normal user, that is at application level, but it is much harder to write them. The user just needs to call the coroutine like a normal function, except he is interested in the return value. To obtain it, he calls the method and registers an observer for the "returnValue" property, waiting until the method is finished so that he can then process the return value asynchronously.

Constructor Details

`nokia.maps.util.Coroutine(name, fn)`

This method is the constructor for the class.

It creates an instance of the class on the basis of the arguments supplied by the caller.

Parameters:

`name:`	`{String}`
	The name of the coroutine
`fn:`	`{Function}`
	The function that implements the coroutine

www.EngineeringBooksPdf.com

Property Details

`static` **`AF_MAX_EXEC_TIME`**`: {Number}`

This property holds the maximal execution time for those coroutine being executed within the animation frame request (see *nokia.maps.util.Coroutine.ExecutionContext#useAnimationFrame* and nokia.maps.util.Coroutine#MAX_EXEC_TIME for details.

`static` **`AF_SLICE_SIZE`**`: {Number}`

This property holds the maximal size of each time slice for a coroutine being executed within the animation frame request (see *nokia.maps.util.Coroutine.ExecutionContext#useAnimationFrame* and nokia.maps.util.Coroutine#SLICE_SIZE for details.

`static constant` **`BLOCKED`**`: {Object}`

This property holds a special object returned by the `sleep()`, `wait()` and `suspend()` methods.

`static constant` **`BLOCKING`**`: {Number}`

Coroutine status constant indicating that a context is blocked at a condition or sleeping.

`static constant` **`KILLED`**`: {Object}`

This property holds a special object returned by the `kill()` method.

`static` **`MAX_EXEC_TIME`**`: {Number}`

This property holds the maximum execution time or the number of milliseconds consumed by coroutines before control is handed over to the browser and so to other JavaScript code.

The smaller this time slice becomes, the more often the browser regains control and the smoother the execution of coroutines, so the browser appears to be more responsive, but as more overhead is produced and finally as less CPU time is used for the API, so as slower the API execution.

`static constant` **`RUNNING`**`: {Number}`

Coroutine status constant indicating that a context is currently running.

www.EngineeringBooksPdf.com

`static` **`SLICE_SIZE`**`: {Number}`

This property holds the maximum size of each time slice for a coroutine.

This value determines how many coroutines can run per scheduled time period, so it decides how long it takes until a coroutine gets a slice of CPU time. If this value is too big and a large number of coroutines run simultaneously, it can take seconds until each coroutine gets some CPU time, so tasking becomes unsteady, but performance is improved as fewer coroutine switches occur. If this value is too small and a large number of coroutines run at simultaneously, each coroutine gets a slice of CPU time faster, but the slice is also smaller, so execution of coroutines may seem to smoother, but the amount of CPU time lost due to coroutine switching increases, so the overall performance decreases.

This value is normally exactly 25% of the maximum execution time and you should keep it around that value. However, if you decrease the maximum execution time below 50ms you should consider increasing this value to 100%, so the same value as the maximum execution time and if you increase the maximum execution time to above 300ms you should consider changing this value to 10% of the maximum execution time (e.g. 75 for 300).

`static constant` **`TERMINATED`**`: {Number}`

Coroutine status constant indicating that a context is terminated.

`static constant` **`YIELDED`**`: {Object}`

This property holds a special object returned by the `yield()` method.

Method Details

`static` **`all()`**`: {`*`nokia.maps.util.Coroutine.ExecutionContext`*`[]}`

This method returns an array with all the execution contexts currently marked as "running" or "blocking".

Returns:

{*`nokia.maps.util.Coroutine.ExecutionContext`*`[]}`

An array with all execution contexts in the state "running" or "blocking", the array may be empty if no context is currently executed

www.EngineeringBooksPdf.com

`static` **`broadcast`**`(obj)`

This method signals all coroutines blocking on an object and resumes them.

Parameters:

`obj:` `{Object}`

The object on which to resume all blocking coroutines.

Example:

```
var Coroutine = nokia.maps.util.Coroutine,
   condition = {},
   myCo = Coroutine.create("myCo", function (scope, context) {
       // If this is the first run ...
           if (!scope.ip) {
               // ... block on the condition.
               scope.ip = 1;

               return Coroutine.wait(condition);
           }
           alert("coroutine "+ context.name+" is now awake!");
           // coroutine terminates here.
   });

// Call the coroutine twice.
myCo();
myCo();

// After two seconds, wake all waiting coroutines.
setTimeout(function () {
    Coroutine.broadcast(condition);
}, 2000);
```

`static` **`catchException`**`(enable)`

This method enables exception catching in the scheduler to ignore errors in coroutines or it can be used to disable exception catching for debugging purposes. By default, exceptions are caught and written into the debug console.

Parameters:

`enable:` `{Boolean}`

`true` enables exception catching, `false` disables it

www.EngineeringBooksPdf.com

`static` **`count`**`(): {Number}`

This method retrieves the number of contexts not being terminated, thus the return value includes all running and blocked contexts.

Returns:

`{Number}`	The number of contexts that are not terminated

`static` **`create`**`(name, fn, args): {Function}`

This method creates a new coroutine, using the name and implementation supplied by the caller.

Parameters:

`name:`	`{String}`
	The name of the coroutine
`fn:`	`{Function}`
	The function that implements the coroutine
`args ...:`	`{String}` [optional]
	An unlimited number of strings with the names of the arguments of this function

Returns:

`{Function}`	The coroutine with the supplied function as internal run-function
See:	*nokia.maps.util.Coroutine*

`static` **`createEx`**`(name, fn, defaults, args): {Function}`

This method creates a new coroutine using the name and implementation supplied by the caller. It creates coroutine by *nokia.maps.util.Coroutine.create* call and links defaults to the coroutine context.

Parameters:

`name:`	`{String}`

www.EngineeringBooksPdf.com

	The name of the coroutine
`fn:`	`{Function}`
	The function that implements the coroutine
`defaults:`	`{Object}` [optional]
	A hashmap with default values for all created contexts, currently the only options being supported are `priority` and `useAnimationFrame`
`args ...:`	`{String}` [optional]
	An unlimited amount of strings with the names of the arguments of this function

Returns:

`{Function}`	The coroutine with the supplied function as internal run-function
See:	*nokia.maps.util.Coroutine*

`static` **`current`**`(): {`*`nokia.maps.util.Coroutine.ExecutionContext`*`}`

This method returns the currently executed context or `null` if no context is executed right now.

Returns:

{*`nokia.maps.util.Coroutine.ExecutionContext`*}	
	The currently executed context or `null` if no context is executed

`static` **`forId`**`(id): {`*`nokia.maps.util.Coroutine.ExecutionContext`*`}`

This method retrieves the execution context with the given id or `undefined` if no such context exists.

Parameters:

`id:`	`{String}`
	The unique execution context id for which to search

www.EngineeringBooksPdf.com

Returns:

{*nokia.maps.util.Coroutine.ExecutionContext*}

The execution context with the given unique id or undefined if no context with that id exists

`static` **`forName`**`(name): {`*`nokia.maps.util.Coroutine.ExecutionContext`*`[]}`

This method searches through the list of all contexts currently in the "running" or "blocking" state and returns all those that are bound to the coroutine with the name supplied by the caller.

Parameters:

`name`: {RegExp | String}

The name of the coroutine to find or the regular expression to match against the coroutine name

Returns:

{*nokia.maps.util.Coroutine.ExecutionContext*[]}

An array with all contexts where the matching name was found or an empty array if no coroutine matches

`static` **`kill`**`(context, reason): {Object}`

This method immediately terminates the currently executed coroutine or the supplied coroutine context.

Parameters:

`context`: {*nokia.maps.util.Coroutine.ExecutionContext*} [optional]

The coroutine context to terminate; if not provided, the currently executed coroutine context is terminated, if executed

`reason`: {Object} [optional]

Reason for termination, if any; if the first argument is omitted, the second argument becomes the first and must not be an instance of *nokia.maps.util.Coroutine.ExecutionContext*.

www.EngineeringBooksPdf.com

Returns:

`{Object}`	If the context is killed, the method returns a nokia.maps.util.Coroutine.KILL object, otherwise `undefined`

`static killAll()`

This method destroys all execution contexts currently in the "running" or "blocking" state.

The method is intended for debugging purposes or to be used when the user has left a Web site and resources are to be freed.

`static resume(context)`

This method resumes the supplied executed execution context.

It unblocks the context from any condition on which it is currently blocked or wakes it up if it is sleeping. If it is a realtime context, the context becomes the next one to be executed, otherwise it is added at the end of the pending contexts.

Parameters:

`context:`	{*`nokia.maps.util.Coroutine.ExecutionContext`*} The execution context to resume

`static scheduler(isTestUnitCall)`

This method forces the scheduler to run at once.

Note that you should avoid calling this method, except if you have a very specific reason to do so, because by calling the scheduler directly, you bypass the normal scheduling and therefore you can cause the coroutine switching to become jerky and the browser might become unresponsive.

Parameters:

`isTestUnitCall:`	`{Boolean}` [optional] True if this is a test unit call, false otherwise (this parameter may only be used for internal test units).

www.EngineeringBooksPdf.com

`static` **`schedulerCpuTime`**`(): {Number}`

This method retrieves the total CPU time that the scheduler itself has consumed.

The returned value is not very precise, because some method calls are not be counted for the scheduler due to performance impact. If the context calls for example `yield()` or `sleep()`, this counts as context time, even though a small amount of that time normally should have be scheduler time.

Returns:

`{Number}`	The number of milliseconds of CPU time the scheduler has consumed for itself

`static` **`schedulerNextRuntime`**`(): {Number}`

This method retrieves the UNIX timestamp showing when the scheduler should run again.

This together with the manual scheduler call can be used to work around browser bugs such as the bug in IE that causes it not to call any function registered using `setTimeout` or `setInterval` while the user drags with the left mouse button. To counteract this, for example, *nokia.maps.dom.Page* class implements a workaround that calls the scheduler within a mousemove or drag event if the current time is later then the scheduler's next run time.

Returns:

`{Number}`	The UNIX timestamp showing when the scheduler should be executed again

`static` **`scope`**`(fn)`

This method clones the given function and moves the clone into the internal scope of the coroutine scheduler, removing the original scope remembered by the function.

This method is intended for debugging or hot-fixing purposes. It allows you to modify, read and replace internal methods and properties.

Parameters:

`fn:`	`{Function}` The function which is copied into the scope.

www.EngineeringBooksPdf.com

`static` **`shallYield`**`(): {Boolean}`

This method checks if the currently executed coroutine context must yield or not.

Returns:

`{Boolean}`	`true` if the currently executed coroutine context is to yield control, otherwise `false`

`static` **`signal`**`(obj): {`*`nokia.maps.util.Coroutine.ExecutionContext`*`}`

This method signals the given object and resumes the next coroutine that is blocked on this object, if any.

Parameters:

`obj:`	`{Object}` The object on which to signal the next blocking coroutine

Returns:

`{`*`nokia.maps.util.Coroutine.ExecutionContext`*`}`

Either the context that has been unblocked or `undefined` if no coroutine was blocking on this object

Example:

```
 var Coroutine = nokia.maps.util.Coroutine,
    condition = {},
    myCo = Coroutine.create("myCo", function (scope, context) {
            // If this is the first run ...
        if (!scope.ip) {
            // ... block on the condition.
            scope.ip = 1;
            return Coroutine.wait(condition);
        }
        alert("coroutine is now awake!");
        // coroutine terminates here.
    });
// Call the coroutine.
myCo();
// In 2 seconds wake the coroutine up.
setTimeout(function () {
    Coroutine.signal(condition);
}, 2000);
```

www.EngineeringBooksPdf.com

`static` **`sleep`**`(timeout, context): {Object}`

This method puts a coroutine context to sleep.

Parameters:

`timeout:`	`{Number}` [optional] The number of milliseconds the coroutine context is to sleep; if omitted, the coroutine sleeps until resumed or terminated
`context:`	{*`nokia.maps.util.Coroutine.ExecutionContext`*} [optional] The execution context to put to sleep; if not given, the currently executed execution context is used, if any

Returns:

`{Object}`	If the context is blocked, the method returns the *nokia.maps.util.Coroutine.BLOCKED* object, otherwise `undefined`

Example:

```
        // Always use a "return" when calling Coroutine.sleep() to break
 the current execution.
       return Coroutine.sleep(10000, myCoCtx);
```

`static` **`suspend`**`(context, timeout): {Object}`

The method suspends the supplied execution context or the currently executed context.

Parameters:

`context:`	{*`nokia.maps.util.Coroutine.ExecutionContext`*} [optional] The execution context that to suspend; if omitted or `null`/`undefined`, the currently executed context is suspended, if any
`timeout:`	`{Number}` [optional] The maximum amount of time to block in milliseconds; if `null` or `undefined`, the method blocks until the coroutine is notified, resumed or terminated

www.EngineeringBooksPdf.com

Returns:

{Object}	If the context is blocked, the method returns the *nokia.maps.util.Coroutine.BLOCKED* object, otherwise undefined

Example:

```
        // Always use a "return" when calling Coroutine.suspend() to
break the current execution.
       return Coroutine.suspend(myCoCtx);
```

static **taskCpuTime**(): {Number}

This method retrieves the total CPU time that all contexts have consumed.

Returns:

{Number}	The number of milliseconds of CPU time all contexts have consumed together

static **totalCpuTime**(): {Number}

This method retrieves the number of milliseconds since the scheduler was started.

Returns:

{Number}	The number of milliseconds since the scheduler was started

static **wait**(obj, timeout, context): {Object}

This method blocks the a coroutine on the object provided by the caller.

Note that the object gets a new property called "$blocking" which is managed by the coroutine manager and must not be modified.

Parameters:

obj:	{Object} The object on which the coroutine is to be blocked
timeout:	{Number} [optional]

www.EngineeringBooksPdf.com

	If provided, this argument is the maximum length of time in milliseconds that the coroutine blocks, otherwise if the argument is `null` or `undefined`, the method blocks for ever
`context:`	{*nokia.maps.util.Coroutine.ExecutionContext*} [optional]
	The execution context to block; if the argument is omitted, the currently executed context is used, if any is currently executed

Returns:

`{Object}`	If the context is blocked, the method returns the *nokia.maps.util.Coroutine.BLOCKED* object; otherwise `undefined`

Example:

```
     var Coroutine = nokia.maps.util.Coroutine,
        condition = {},
        myCo = Coroutine.create("myCo", function (scope, context) {
            // If this is the first run ...
            if (!scope.ip) {
                // ... block on the condition.
                scope.ip = 1;
                // Using a "return" when calling Coroutine.yield() we
 break the current execution
                return Coroutine.wait(condition);
            }
            alert("coroutine is now awake!");
            // coroutine terminates here.
        });
    // Call the coroutine.
    myCo();
    // Wake up the coroutine in two seconds.
    setTimeout(function () {
        Coroutine.signal(condition);
    }, 2000);
```

`static` **`yield`**`(context): {Object}`

This method makes the currently executed coroutine or the supplied one yield.

Parameters:

`context:`	{*nokia.maps.util.Coroutine.ExecutionContext*}

www.EngineeringBooksPdf.com

The execution context of the coroutine to yield, if not given the currently executed context is suspended

Returns:

`{Object}` If the context is blocked the method returns the *nokia.maps.util.Coroutine.YIELDED* object, otherwise `undefined`

Example:

```
    var YIELD_EVERY = 64,
       yieldCount = 0,
       Coroutine = nokia.maps.util.Coroutine,
       myCo = Coroutine.create("myCo", function (scope, context) {
           console.log("yieldCount" + yieldCount);
           while (++yieldCount < 1000) {
               // Break the execution of the while loop, using the yield
method.
               // Using a "return" when calling Coroutine.yield() we
break the current execution.
               if (!(yieldCount % YIELD_EVERY)) return Coroutine.yield();

               // coroutine terminates here.
           }
       });
   myCo();
```

Class: ExecutionContext

This class is a member of ***nokia.maps.util.Coroutine***.

Class Summary

This class represents the execution context of a coroutine.

[*For full details, see nokia.maps.util.Coroutine.ExecutionContext*]

Table 202: Property Summary

Properties
callTime: {Number} This property holds the UNIX timestamp showing when the execution context was called.
constant ***coroutine***: {*nokia.maps.util.Coroutine*} This property holds the coroutine to which the given execution context belongs (calling a coroutine always returns an execution context).

www.EngineeringBooksPdf.com

Properties
constant ***id***: {String} This property holds the unique id of the given execution context.
constant ***name***: {String} This property holds the name of the coroutine that is being executed for this execution context.
constant ***parent***: {*nokia.maps.util.Coroutine.ExecutionContext*} This property holds a reference to the parent execution context or `null` if this is the global execution context.
realtime: {Boolean} If this property is set to `true`, it has an effect on the scheduler and on how a context is resumed.
returnValue: {Object} This property hold the value returned by the coroutine of the execution context at termination.
constant ***scope***: {*nokia.maps.util.Coroutine.Scope*} This property holds an object that contains the variable values used within the coroutine.
status: {Number} This property holds the status of the execution context.
timeStamp: {Number} This property holds the latest UNIX timestamp known for the given execution context.
useAnimationFrame: {Boolean} If this property is set to `true`, the scheduler moves the coroutine into the animation queue.

Table 203: Method Summary

Methods
nice () : {Number} This method retrieves the current nice value for the given coroutine.
onError (scope, context, error) : {Exception} If a context has a method `onError()` attached to it, the method is called as soon as an uncaught exception has been raised somewhere within the coroutine of the context.
onTerminated (scope, context) If a context has a method `onTerminated()` attached to it, this method is called as soon as the coroutine has finished.
run (synchron, force) : {Number}

www.EngineeringBooksPdf.com

Methods
The `run()` method of an execution context can be called to force immediate execution of the coroutine associated with the context.

Class Description

This class represents the execution context of a coroutine. The execution context of a coroutine is an emulated execution context, similar to the native execution context of a normal JavaScript function, with the difference that the coroutine execution context can be suspended and recovered. Therefore multiple JavaScript functions (coroutines) can run in parallel, cooperatively sharing the CPU. The execution context contains all the information about the state of an asynchronous function call (so about a coroutine call). The state information includes the coroutine `status` (running, blocking or terminated), the `returnValue` and the local variable stack (`scope`).

The execution context of a coroutine can be compared with the handle returned by the method `setInterval()`, but the execution context contains more information. The execution context allows data transfer between calls to the coroutine and permits all asynchronous coroutines to share CPU time cooperatively between them, keeping the browser responsive, while one or multiple complex operations are ongoing.

For a more detailed description of what an execution context is an how it behaves, please refer to the documentation for the class *nokia.maps.util.Coroutine*.

Constructor Details

`nokia.maps.util.Coroutine.ExecutionContext``(coroutine, args)`

Creates execution context.

Parameters:

`coroutine:`	{*`nokia.maps.util.Coroutine`*}
`args:`	{`Object`}

Property Details

`callTime``: {Number}`

This property holds the UNIX timestamp showing when the execution context was called. The timestamp is valid only as long as the given execution context is the currently executing context.

www.EngineeringBooksPdf.com

`constant` **`coroutine`**: {*`nokia.maps.util.Coroutine`*}

This property holds the coroutine to which the given execution context belongs (calling a coroutine always returns an execution context).

`constant` **`id`**: {`String`}

This property holds the unique id of the given execution context.

`constant` **`name`**: {`String`}

This property holds the name of the coroutine that is being executed for this execution context.

`constant` **`parent`**: {*`nokia.maps.util.Coroutine.ExecutionContext`*}

This property holds a reference to the parent execution context or `null` if this is the global execution context.

`realtime`: {`Boolean`}

If this property is set to `true`, it has an effect on the scheduler and on how a context is resumed.

Normally the scheduler sleeps for at least a specific amount of milliseconds before it continues to execute coroutines. The reason is that the browser needs this time for rendering and event processing. If a coroutine context is set to `realtime`, the scheduler ensures that it is executed exactly (as far as possible) at the desired time, regardless of the risk that the browser might receive only a few milliseconds or no time time at all for rendering and event processing. Furthermore, a real time context is put at the front of the round robin list and always ahead of any non-realtime contexts in the priority list.

This means that realtime contexts may make the browser unresponsive and slow down all other normal coroutine contexts. Therefore, we highly recommend that you do not make contexts realtime unless there is a very good reason to do so.

`returnValue`: {`Object`}

This property hold the value returned by the coroutine of the execution context at termination.

www.EngineeringBooksPdf.com

`constant` **`scope`**`: {`*`nokia.maps.util.Coroutine.Scope`*`}`

This property holds an object that contains the variable values used within the coroutine. For example, the object includes the property "arguments".

`status``: {Number}`

This property holds the status of the execution context. The possible values are *nokia.maps.util.Coroutine.TERMINATED*, *nokia.maps.util.Coroutine.RUNNING* or *nokia.maps.util.Coroutine.BLOCKING* (default).

`timeStamp``: {Number}`

This property holds the latest UNIX timestamp known for the given execution context. The property is updated whenever the execution of the execution context begins and whenever the context calls the method `shallYield()`.

If the `shallYield()` is regularly called by a coroutine, then this property always contains the current UNIX timestamp.

`useAnimationFrame``: {Boolean}`

If this property is set to `true`, the scheduler moves the coroutine into the animation queue. This means that the coroutine is only executed within the `requestAnimationFrame` callback. See also W3C *http://www.w3.org/TR/animation-timing/*. We strongly recommend setting this property to `true` if a method has a large CPU impact.

The animation queue does not follow the normal scheduling process, because it runs in parallel to the normal process and has only a priority list. If multiple rendering tasks run at the same time, the most important one may be done first, while the others have to wait until it has finished. However, because the execution of a coroutine reflects its priority, an exact execution order cannot be guaranteed. It can be said that the coroutine that is executed the fastest and has the highest priority is executed first, while the coroutine with the lowest priority that consumes the most time is executed last.

Another difference between the scheduling of the animation queue and normal scheduling is that sleep or wait times are not precise, because the rendering is bound to the `requestAnimationFrame` method of the browser. If a browser tab is in the background, the browser reduceS the number of calls to the `requestAnimationFrame()` method dramatically and may even cut it down to zero, therefore reducing the amount of time used for rendering. This helps save battery power on mobile devices, because while a user is not viewing a page no animation

www.EngineeringBooksPdf.com

frame requests are performed. Therefore even methods that have nothing to do with rendering, but are very expensive (for example heavy calculations) may be marked as `useAnimationFrame` to decrease CPU usage on mobile devices and to save battery power.

Note that if this property is set, `precede` and `postpone` have no effect for the given coroutine context.

Method Details

`nice``(): {Number}`

This method retrieves the current nice value for the given coroutine.

The nice value is the final absolute priority with which the scheduler handles the context. When the nice value is higher, the context acquires CPU time faster. The nice value is limited between -200 (bad context consuming a lot of CPU time with a very low priority) and +100 (good context, not consuming much CPU time, but has a very high priority).

The scheduler executes one context from the round robin list and then the context with the highest nice value from the priority list. Afterwards, it decrements the nice value and increments the activity value.

This has been designed to ensure that each context receives at least a small amount of CPU time (50% is given away in equal chunks to all contexts, regardless of priority) while contexts with a higher priority and those that are often idle receive the other 50% of CPU time, depending on their priority and activity (high priority and low activity comes first).

Activity is taken into account for the reason that there may be contexts waiting for user input. Those contexts have low activity levels, but are very important with regard to user satisfaction, because the user expects a fast reaction to his input. Therefore, activity is a very important point for the scheduler. If a context has a very high priority but it is consuming all the CPU time given to it, it receives a lower priority than an idle context with a very low priority (unless the context with the lower priority begins to consume CPU time as well).

The nice value is calculated simply as priority minus activity, limiting it to a value between -200 (bad) and +100 (good).

Note that the nice value returned by this method is not be updated in real-time for performance reasons. While a coroutine is idle, the nice value decreases, but this is not reflected by this method. Therefore the value returned by the method might not be accurate.

Returns:

`{Number}`	The current nice value of this coroutine (not accurate)

www.EngineeringBooksPdf.com

onError(scope, context, error): {Exception}

If a context has a method onError() attached to it, the method is called as soon as an uncaught exception has been raised somewhere within the coroutine of the context. The method sets the reason for the exception and returns null or undefined, or it returns the exception itself to signal that it was not able to determine the reason for the error and that the context is being terminated.

Parameters:

scope:	{Object} The variable object representing the scope from the context
context:	{*nokia.maps.util.Coroutine.ExecutionContext*} The execution context
error:	{Exception} The exception that was the reason for the error

Returns:

{Exception}	The exception object if the method cannot determine the reason for the exception, null or undefined to indicate that the reason for the exception has been determined and/or that the exception should be ignored by the scheduler

onTerminated(scope, context)

If a context has a method onTerminated() attached to it, this method is called as soon as the coroutine has finished.

Parameters:

scope:	{Object} The variable object representing the scope from the context
context:	{*nokia.maps.util.Coroutine.ExecutionContext*} The execution context

www.EngineeringBooksPdf.com

run(synchron, force): {Number}

The run() method of an execution context can be called to force immediate execution of the coroutine associated with the context. The method is used internally by the scheduler to run a context. It should not be called by third-party applications, except, where there is an important reason to run the context immediately and synchronously.

The run() method removes the coroutine context from all internal lists before the code of the coroutine is executed.

Parameters:

synchron:	{Boolean} [optional] If this argument is provided and true, the method shallYield() never returns true, therefore the context is executed synchronously; please be aware that there is no guarantee that the coroutine will not put itself to sleep unless it supports synchronous calls
force:	{Boolean} [optional] If this argument is true the method will ignore the precedence and postpone settings as well as the useAnimationFrame option, otherwise running the method will not do anything as long as it is postponed to any other method or we're out of an animation frame.

Returns:

{Number}	A UNIX timestamp indicating when the method finished executing

Class: Scope

This class is a member of ***nokia.maps.util.Coroutine***.

Class Summary

Scope is an abstract class designed to hold variables available within the scope of a coroutine.

[*For full details, see nokia.maps.util.Coroutine.Scope*]

www.EngineeringBooksPdf.com

Table 204: Property Summary

Properties
arguments: {Object[]} An array with all the parameters that have been passed to the coroutine.
context: {*nokia.maps.util.Coroutine.ExecutionContext*} The execution context that is bound to the given scope.
global: {*nokia.maps.util.Coroutine.Scope*} The reference to the scope of the global execution context.
that: {Object} The object to which `this` pointed at the time the coroutine was called.

Table 205: Method Summary

Methods
hasOwn (name) : {Boolean} This method checks if the variable named by the caller is defined in the given scope.
set (name, value) : {*nokia.maps.util.Coroutine.ExecutionContext*} This method sets the value of a variable on the basis of the variable name and value supplied by the caller.

Class Description

Scope is an abstract class designed to hold variables available within the scope of a coroutine.

Property Details

arguments: {Object[]}

An array with all the parameters that have been passed to the coroutine.

context: {*nokia.maps.util.Coroutine.ExecutionContext*}

The execution context that is bound to the given scope.

global: {*nokia.maps.util.Coroutine.Scope*}

The reference to the scope of the global execution context.

www.EngineeringBooksPdf.com

that: {Object}

The object to which this pointed at the time the coroutine was called.

Method Details

hasOwn(name): {Boolean}

This method checks if the variable named by the caller is defined in the given scope. The method is an alias for the W3C method hasOwnProperty(). It returns a Boolean indicating whether a variable with the given name is defined at this scope. The method is an alias to W3C's hasOwnProperty().

Parameters:

name:	{String}
	The string containing the name of the property to be tested.

Returns:

{Boolean}	true if the property exists in this scope, otherwise false

set(name, value): {*nokia.maps.util.Coroutine.ExecutionContext*}

This method sets the value of a variable on the basis of the variable name and value supplied by the caller. The method searches all scopes in the scope chain and sets the the value of the first variable with a matching name. If no matching variable exists, the method creates it within the global scope.

This method simulates the behavior of the normal assignment in JavaScript, example:

```
var Coroutine = nokia.maps.util.Coroutine,
 outerFn = function () {
  var text = "Old Value",
   innerFn = function () {
    // Modifies the "text" variable from the parent scope:
    text = "New Value";
   };
  innerFn();
  alert(text);
 };
var outerCo = Coroutine.create("outer", function (scope) {
 scope.text = "Old Value";
 scope.innerCo = Coroutine.create("inner", function (scope) {
  // The assignment
  //     scope.text = "New Value";
```

www.EngineeringBooksPdf.com

```
  // results in a new variable with the value "New Value"
  // in the current scope and does not change the variable
  // named 'text' in the parent scope. Therefore to change
  // the value of the variable 'text' in the parent scope,
  // it is necessary to use the method set():
  scope.set("text", "New Value");
 });

 scope.ctx = scope.innerCo();
 scope.ctx.run();
 alert(scope.text);
});
outerFn();
outerCo();
```

Parameters:

name:	{String}
	The string containing the name of the property to be set
value:	{Object}
	The value to be assigned to property specified by the argument name

Returns:

{*nokia.maps.util.Coroutine.ExecutionContext*}

A reference to the given execution context for chaining (this)

Class: Event

This class is a member of ***nokia.maps.util***.

Class Summary

Simplified Event class without bubbling.

[*For full details, see nokia.maps.util.Event*]

Table 206: Property Summary

Properties
readonly ***defaultPrevented***: {Boolean}
This property indicates whether preventDefault() has been called for this event.
readonly ***target***: {*nokia.maps.util.EventTarget*}

www.EngineeringBooksPdf.com

Properties
This property holds the target object of the event.
timeStamp: {Number} This property specifies the time at which the event was created in milliseconds relative to 1970-01-01T00:00:00Z.
readonly ***type***: {String} This property holds the local name of the event type.

Table 207: Method Summary

Methods
preventDefault () This method cancels the default action for the given event.

Class Description

This class implements a Event like the W3C interface but simplified (no bubble and capture phases) *Event* but with less complexity. See also *Concept event*

For more details about event dispatch please refer to the documentation of the class *nokia.maps.util.EventTarget*.

Constructor Details

nokia.maps.util.Event(type)

Parameters:

type:	{String}	
	The type of the Event	

Property Details

readonly **defaultPrevented**: {Boolean}

This property indicates whether preventDefault() has been called for this event.

readonly **target**: {*nokia.maps.util.EventTarget*}

This property holds the target object of the event.

www.EngineeringBooksPdf.com

timeStamp: {Number}

This property specifies the time at which the event was created in milliseconds relative to 1970-01-01T00:00:00Z.

readonly **type**: {String}

This property holds the local name of the event type.

Method Details

preventDefault()

This method cancels the default action for the given event.

Class: EventTarget

This class is a member of ***nokia.maps.util***.

Class Summary

This class implements the W3C DOM Level 3 interface *EventTarget*

[*For full details, see nokia.maps.util.EventTarget*]

Table 208: Method Summary

Methods
addListener (type, callback) This method registers an event listener on the EventTarget
dispatch (evt) : {Boolean} This method dispatches an event.
removeListener (type, callback) This method removes an event listener.

Class Description

This class implements the W3C DOM Level 3 interface *EventTarget* It can be used as a mixin for any JavaScript class or it can be applied at runtime to any JavaScript object by simply patch the object to

www.EngineeringBooksPdf.com

`EventTarget`. Note that for the sake of compatibility the W3C, some methods have been renamed. For example, `addEventListener()` becomes `addListener()`.

Usage example:

```
myObject = new nokia.maps.util.EventTarget()
myObject.addListener("customEvent", function (evt) {
  alert( evt.type );
});
// Now you can fire an event at "myObject":
myObject.dispatch(
  new nokia.maps.util.Event("customEvent")
);
```

The listener queue

Constructor Details

`nokia.maps.util.EventTarget(obj)`

The class constructor mixes the functionality of `EventTarget` into the argument object.

Parameters:

`obj:`	`{Object}`	The object to be extended with EventTarget functionality

Method Details

`addListener(type, callback)`

This method registers an event listener on the EventTarget

Parameters:

`type:`	`{String}`	Specifies the event type for which the listener is to be registered.
`callback:`	`{Function}`	The function used as the callback for the event. This function is called whenever an event occurs of the event type for which the listener was registered. The function receives an event argument that contains contextual information about the event (see *nokia.maps.util.Event*).

www.EngineeringBooksPdf.com

dispatch(evt): {Boolean}

This method dispatches an event.

Parameters:

evt:	{*nokia.maps.util.Event*} An object representing the event to be dispatched

Returns:

{Boolean}	Indicates whether any of the listeners which handled the event called `Event.preventDefault()`. If `Event.preventDefault()` was called, the return value is `false`, otherwise it is `true`

removeListener(type, callback)

This method removes an event listener. Calling removeListener with arguments that do not identify any currently registered listener on the EventTarget has no effect.

Parameters:

type:	{String} Specifies the event type associated with the event for which the listener was registered.
callback:	{Function} The callback function to be removed.

Interface: IArrows

This interface is a member of ***nokia.maps.util***.

Interface Summary

This interface encapsulates properties of arrows that can be drawn, for example, along a route polyline to indicate the direction of travel.

[*For full details, see nokia.maps.util.IArrows*]

www.EngineeringBooksPdf.com

Table 209: Property Summary

Properties
`readonly` ***`color`***`: {String}` This property holds the value of the fill color used for the arrow shapes.
`readonly` ***`frequency`***`: {Number}` This property indicates the frequency of arrow shapes.
`readonly` ***`length`***`: {Number}` This property indicates the length of the arrow shapes.
`readonly` ***`width`***`: {Number}` This property indicates the width of the arrow shape.

Interface Description

This interface represents the common properties of arrow objects that can be drawn on the map, typically superimposed on a polyline representing a route to indicate the direction of travel. An implementation of this interface can be used in *nokia.maps.map.Polyline* to define the arrows style.

Property Details

`readonly` **`color`**`: {String}`

This property holds the value of the fill color used for the arrow shapes. The format is RGBA (the alpha value is optional). When defining the RGBA value, please follow the CSS specification, which requires a string containing:

- a leading "#" character (followed by ...)
- two or one hex digits for every channel

Default Value: "#FFFC"

`readonly` **`frequency`**`: {Number}`

This property indicates the frequency of arrow shapes. The value is taken as factor of the length of the arrow. The value must be greater than 0 (zero). A value of 1 results in arrows without spaces between them.

Default Value: 5

www.EngineeringBooksPdf.com

`readonly` **`length`**`: {Number}`

This property indicates the length of the arrow shapes. The value is taken as a factor of the width of the line at the end of which the arrow is drawn. The value must be greater than 0.

Default Value: `1.6`

`readonly` **`width`**`: {Number}`

This property indicates the width of the arrow shape. The value is taken as a factor of the width of the line, where the arrow description is applied. The value must be greater than 0.

Default Value: `1.2`

Interface: IBox

This interface is a member of ***`nokia.maps.util`***.

Interface Summary

This interface defines a box.

[*For full details, see nokia.maps.util.IBox*]

Table 210: Property Summary

Properties
`bottom``: {Number}` This property holds the numeric value for the bottom side of the box.
`left``: {Number}` This property holds the numeric value for the left side of the box.
`right``: {Number}` This property holds the numeric value for the right side of the box.
`top``: {Number}` This property holds the numeric value for the top side of the box.

www.EngineeringBooksPdf.com

Interface Description

This interface class defines a box with properties that hold the screen coordinates of the sides of the box: top, right, bottom and left.

Property Details

`bottom`: `{Number}`

This property holds the numeric value for the bottom side of the box.

`left`: `{Number}`

This property holds the numeric value for the left side of the box.

`right`: `{Number}`

This property holds the numeric value for the right side of the box.

`top`: `{Number}`

This property holds the numeric value for the top side of the box.

Interface: IBrush

This interface is a member of ***`nokia.maps.util`***.

Interface Summary

This interface represents brush objects.

[*For full details, see nokia.maps.util.IBrush*]

Table 211: Property Summary

Properties
`readonly` ***`color`***`: {String}` This property holds the value of the fill color used for the brush.
`readonly` ***`fill`***`: {String}` This property indicates the fill type to be used for the brush.

www.EngineeringBooksPdf.com

Interface Description

This interface represents the common properties of brush objects. An implementation of this interface can be used in *nokia.maps.map.Object* to define fill colors.

Property Details

`readonly` **`color`**`: {String}`

This property holds the value of the fill color used for the brush. The format is RGBA (the alpha value is optional). When defining the RGBA value, please follow the CSS specification, which requires a string containing:

- a leading "#" character (followed by ...)
- two or one hex digits for every channel

Default Value: `"#00F8"`

`readonly` **`fill`**`: {String}`

This property indicates the fill type to be used for the brush. The value should be one of the following:

- "solid" - indicates a sold fill
- "none" - indicates no fill

Default Value: `"solid"`

Interface: IPen

This interface is a member of ***`nokia.maps.util`***.

Interface Summary

This interface class defines a IPen object.

[*For full details, see nokia.maps.util.IPen*]

Table 212: Property Summary

Properties
`readonly` ***`lineCap`***`: {String}`

www.EngineeringBooksPdf.com

Properties
This property specifies the shape to be used at the end of open subpaths when they are stroked.
`readonly` ***`lineJoin`***`: {String}`
This property specifies the shape to be used on the corners of paths or basic shapes when they are stroked.
`readonly` ***`lineWidth`***`: {Number}`
This property holds the width of lines in coordinate space units.
`readonly` ***`miterLimit`***`: {Number}`
The miter length is the distance from the point, where the join occurs to the intersection of the line edges on the outside of the join.
`readonly` ***`stroke`***`: {String}`
This property specifies the lines around shapes.
`readonly` ***`strokeColor`***`: {String}`
This property represents the color to use for the lines drawn around shapes.

Interface Description

This interface class defines a IPen object. IPen object is used in *nokia.maps.map.Object* to define outline color.

Property Details

`readonly` **`lineCap`**`: {String}`

This property specifies the shape to be used at the end of open subpaths when they are stroked. The value should be one of the following:

- "butt"
- "round"
- "square"

Default Value: `"round"`

`readonly` **`lineJoin`**`: {String}`

This property specifies the shape to be used on the corners of paths or basic shapes when they are stroked. The value should be one of the following:

- "miter"

www.EngineeringBooksPdf.com

- "bevel"
- "round"

Default Value: `"miter"`

`readonly` **`lineWidth`**`: {Number}`

This property holds the width of lines in coordinate space units.

Default Value: `1`

`readonly` **`miterLimit`**`: {Number}`

The miter length is the distance from the point, where the join occurs to the intersection of the line edges on the outside of the join. The miter limit ratio is the maximum allowed ratio of the miter length to half the line width. If the miter length were to cause the miter limit ratio to be exceeded, this second triangle must not be rendered.

Default Value: `10`

`readonly` **`stroke`**`: {String}`

This property specifies the lines around shapes. The value should be one of the following:

- "solid"

Default Value: `"solid"`

`readonly` **`strokeColor`**`: {String}`

This property represents the color to use for the lines drawn around shapes.

Default Value: `"#00F8"`

Interface: IPoint

This interface is a member of ***`nokia.maps.util`***.

www.EngineeringBooksPdf.com

Interface Summary

This interface defines the property of a point object in a two-dimensional coordinate space.

[*For full details, see nokia.maps.util.IPoint*]

Table 213: Property Summary

Properties
`readonly` ***x***`: {Number}` The x coordinate of the point.
`readonly` ***y***`: {Number}` The y coordinate of the point.

Interface Description

This interface defines the property of a point object in a two-dimensional coordinate space.

Property Details

`readonly` **`x`**`: {Number}`

The x coordinate of the point.

`readonly` **`y`**`: {Number}`

The y coordinate of the point.

Class: OList

This class is a member of ***`nokia.maps.util`***.

Class Summary

This class defines an observable list.

[*For full details, see nokia.maps.util.OList*]

Table 214: Method Summary

Methods
`add` `(element, idx) : {`*`nokia.maps.util.OList`*`}`

www.EngineeringBooksPdf.com

Methods
This method adds a new element to the list.
addAll `(elements, idx) : {`*`nokia.maps.util.OList`*`}` This method adds multiple new elements to the list.
addObserver `(callback, context)` This method registers a new observer on the given instance of `OList`.
asArray `() : {Array}` This method gets the list as an array.
clear `()` This method clears all elements from the list.
get `(idx) : {Variant}` This method gets the value for the specified list element.
getLength `() : {Number}` This method getg the length of the list.
indexOf `(obj) : {Number}` This method retrieves the index of the first object in this list that matches the object supplied by the caller.
remove `(obj) : {Variant}` This method removes from the list the first element that matches the object supplied by the caller.
removeAll `(elements) : {`*`nokia.maps.util.OList`*`}` This method removes multiple elements from the list.
removeAt `(idx) : {Variant}` This method removes an element by a given index from the list.
removeObserver `(callback, context) : {`*`nokia.maps.util.OObject`*`}` This method unregisters an observer.
set `(element, idx) : {Variant}` This method sets (replaces) an element at the given index in the list.

Class Description

This class defines an observable list.

www.EngineeringBooksPdf.com

Constructor Details

nokia.maps.util.OList(elements)

This method initializes a new instance of the class.

Parameters:

elements:	{Array} [optional, default: []] The initial list elements to use; if omitted, an empty array is used

Method Details

add(element, idx): {*nokia.maps.util.OList*}

This method adds a new element to the list.

Parameters:

element:	{Variant} The new element to add
idx:	{Number} [optional] The index where the new element should be inserted; if omitted or greater then the current size of the list, the element is added at the end of the list; a negative index is treated as being relative from the end of the list

Returns:

{*nokia.maps.util.OList*}

The given instance of OList

Throws:

{IllegalState}	When an observer triggers a rollback during an ongoing rollback
{IllegaleArgument}	When the argument idx is not a number

addAll(elements, idx): {*nokia.maps.util.OList*}

This method adds multiple new elements to the list.

www.EngineeringBooksPdf.com

Parameters:

`elements`: `{Variant[]}`

The new elements to add

`idx`: `{Number}` [optional]

The index where the new elements should be inserted; if omitted or greater then the current size of the list, the elements are added at the end of the list; a negative index is treated as being relative from the end of the list

Returns:

{*`nokia.maps.util.OList`*}

The given instance of `OList`

Throws:

IllegalState if an observer triggers a rollback during an ongoing rollback

`addObserver(callback, context)`

This method registers a new observer on the given instance of `OList`. The observer is a callback to be invoked when the instance changes, typically when an element is added or removed.

Parameters:

`callback`: `{Function}`

The callback function to be invoked after the list has been modified; the callback must accept the following arguments:

- (OList) oList - the OList instance itself
- (String) operation - the name of the operation which triggered a change to the given instance of `OList` and therefore a call to the callback. The operation is either `"add"` or `"remove"`
- (Variant) element - the element which was added or deleted
- (Number) idx - the index of the element concerned

The callback can signal that a rollback should be triggered by returning `true`.

www.EngineeringBooksPdf.com

context:	{Object} [optional]
	The context to use when the callback is invoked. If not set than global context is used.

asArray(): {Array}

This method gets the list as an array.

Returns:

{Array}	The list as an array

clear()

This method clears all elements from the list.

Throws:

	IllegalState if an observer triggers a rollback during an ongoing rollback

get(idx): {Variant}

This method gets the value for the specified list element.

Parameters:

idx:	{Number}
	The index of the element to get

Returns:

{Variant}	The value of the element

Throws:

	IllegaleArgument if an observer triggers a rollback during an ongoing rollback

www.EngineeringBooksPdf.com

`getLength(): {Number}`

This method getg the length of the list.

Returns:

`{Number}`	The length of the list

`indexOf(obj): {Number}`

This method retrieves the index of the first object in this list that matches the object supplied by the caller.

Parameters:

`obj:`	`{Variant}`
	The object for which to return the index.

Returns:

`{Number}`	The index of the first matching object in this list or -1 if the object provided by the caller is not found in the list

`remove(obj): {Variant}`

This method removes from the list the first element that matches the object supplied by the caller.

Parameters:

`obj:`	`{Variant}`
	The element to remove

Returns:

`{Variant}`	The removed element

Throws:

	IllegalState if an observer triggers a rollback during an ongoing rollback.

www.EngineeringBooksPdf.com

removeAll(elements): {*nokia.maps.util.OList*}

This method removes multiple elements from the list.

Parameters:

elements:	{Variant[]}
	The elements to remove

Returns:

{*nokia.maps.util.OList*}

The given instance of OList

Throws:

IllegalState if an observer triggers a rollback during an ongoing rollback

removeAt(idx): {Variant}

This method removes an element by a given index from the list.

Parameters:

idx:	{Number}
	The index of the element which should be removed

Returns:

{Variant}	The removed element or null if a observer signaled a rollback

Throws:

IllegalState if an observer triggers a rollback during an ongoing rollback

removeObserver(callback, context): {*nokia.maps.util.OObject*}

This method unregisters an observer.

Parameters:

www.EngineeringBooksPdf.com

`callback:` `{Function}`

The observer method to be removed

`context:` `{Object}`

The context in which the given callback should be called

Returns:

{*nokia.maps.util.OObject*}

The reference to the given `OObject` instance

`set``(element, idx): {Variant}`

This method sets (replaces) an element at the given index in the list.

Parameters:

`element:` `{Variant}`

The element to set at the index specified by `idx`

`idx:` `{Number}`

The index of the element which should be replaced

Returns:

`{Variant}` The replaced element or `undefined` if an observer has triggered a rollback

Throws:

IllegalState if an observer triggers a rollback during an ongoing rollback

Class: OObject

This class is a member of ***`nokia.maps.util`***.

Class Summary

This class encapsulates an inheritable object that has observable properties.

[*For full details, see nokia.maps.util.OObject*]

www.EngineeringBooksPdf.com

Table 215: Method Summary

Methods
addObserver `(key, callback, context) : {`*nokia.maps.util.OObject*`}` This method registers an observer for the property named by the caller.
get `(key) : {Variant}` This method retrieves the value of the property with the name provided by the caller.
remove `(key) : {`*nokia.maps.util.OObject*`}` This method removes the property with the name provided by the caller.
removeObserver `(key, callback, context) : {`*nokia.maps.util.OObject*`}` This method removes the observer for the property named by the caller.
set `(nameOrObject, value, force) : {`*nokia.maps.util.OObject*`}` This method sets property values, using the property names and values supplied by the caller.

Class Description

This class encapsulates an inheritable object that has observable properties.

Constructor Details

`nokia.maps.util.OObject(props)`

This method initializes an instance of `OObject` that is inheritable and has observable properties.

Parameters:

`props`:	`{Object}` [optional]	
	The initial hash of properties with names and values.	

Method Details

`addObserver(key, callback, context): {`*nokia.maps.util.OObject*`}`

This method registers an observer for the property named by the caller. Note that modifying the property from within the observer is allowed, but discouraged, because this forces the observer chain to be invoked again and the old one aborted. This could lead to endless recursions and should be done carefully.

Parameters:

www.EngineeringBooksPdf.com

key:	{String}
	The name of the property to observe; the wild card "*" can be used to observe any property
callback:	{Function}
	The function to be called if the observed property is modified; the function must be able to receive the following arguments: • (OObject) obj - a reference to the given object • (String) key - the name of the property that was modified, created or deleted • (Variant) value - the new value that the property should be set to • (Variant) oldValue the old value of the property
context:	{Object} [optional, default: null]
	The context in which the given function should be called. If omitted, the global object is used.

Returns:

{*nokia.maps.util.OObject*}	
	A reference to the given OObject instance

get(key): {Variant}

This method retrieves the value of the property with the name provided by the caller.

Parameters:

key:	{String}
	The name of the property whose value is to be retrieved

Returns:

{Variant}	The retrieved value of the property named by the caller or undefined if no such property exists

www.EngineeringBooksPdf.com

remove(key): {*nokia.maps.util.OObject*}

This method removes the property with the name provided by the caller.

Parameters:

key: {String}

The name of the property to be removed

Returns:

{*nokia.maps.util.OObject*}

The reference to the given OObject instance

removeObserver(key, callback, context): {*nokia.maps.util.OObject*}

This method removes the observer for the property named by the caller.

Parameters:

key: {String}

The name of the property that should no longer be observed

callback: {Function}

The observer method to be removed

context: {Object} [optional]

The context in which the given callback should be called

Returns:

{*nokia.maps.util.OObject*}

The reference to the given instance of OObject

set(nameOrObject, value, force): {*nokia.maps.util.OObject*}

www.EngineeringBooksPdf.com

This method sets property values, using the property names and values supplied by the caller. It takes an object whose keys match property names. The values corresponding to the keys are the new values for the properties to set.

To set a single property, the caller can provide two arguments, the name of the property as a string and the value to be set. For all properties, the following rules apply:

- If no property with the given name exists yet, the property is created.
- If a derived class defines a member method with the name of the key postfixed by "Setter", this method is called first; it is given the value and should return the "filtered" value to be set.
- After this "filtering" all registered observers of this value are called - if and only if this filtered value differs from the old value. The "observers" MUST NOT use code that leads to secondary setting of properties in this object/property or elsewhere, as this could result in endless loops.

The members of the object passed to `set()` are not tested against `hasOwnProperty()`.

Parameters:

`nameOrObject`: `{String | Object}`

The name of the property to be set or the object from which to take the properties and their values

`value`: `{Variant}` [optional]

The value that should be applied to the property; if this argument is present, `nameOrObject` is assumed to hold the name of a property

`force`: `{Boolean}` [optional]

A flag to force an assignment, even if the old value is identical to the new value (default `false`); the flag is taken into account only on setting a single property via name, value

Returns:

{*nokia.maps.util.OObject*}

A reference to the given `OObject` instance

Example:

```
// Setting a single property:
 obj.set("foo", 123);
```

www.EngineeringBooksPdf.com

```
// Setting multiple properties at once:
 obj.set({ foo: 123, bar: "second one" });

// Definition of a "setter" within an object
// that has OObject in its prototype chain:
{
     ...
     fooSetter: function (value) {
         this.wantsToBeTriggered(); // if "foo" changes

         // ensure the value stored to member "foo" is pure int
         return value >>> 0;
     },
     ...
}
```

Class: Pen

This class is a member of ***nokia.maps.util***.

Class Summary

This class defines properties of pen objects that can be used when drawing shape and text.

[*For full details, see nokia.maps.util.Pen*]

Property Summary

Directly Inherited Properties

Inherited from class *nokia.maps.util.IPen* :

lineCap, *lineJoin*, *lineWidth*, *miterLimit*, *stroke*, *strokeColor*

Class Description

This class defines properties of pen objects that can be used when drawing shape and text.

Constructor Details

nokia.maps.util.Pen(props, pen)

This method initializes a Pen object, using default values if property values are not specified by the caller.

Parameters:

www.EngineeringBooksPdf.com

props:	{*nokia.maps.util.IPen*} An object that specifies the initial values for the properties it names; default values are used for any properties that are not named in this object
pen:	{*nokia.maps.util.Pen*} [optional] An object from which to create a new instance of Pen

Class: Point

This class is a member of ***nokia.maps.util***.

Class Summary

This class represents a location within a two-dimensional space.

[*For full details, see nokia.maps.util.Point*]

Table 216: Property Summary

Properties
`static` ***isCoveredBy***`: {String | Boolean}` This method checks if the x/y coordinate is covered by the given shape.

Directly Inherited Properties

Inherited from class *nokia.maps.util.IPoint* :

x, *y*

Table 217: Method Summary

Methods
add `(other) : {`*nokia.maps.util.Point*`}` This method obtains the sum of the given point and the point supplied by the caller.
ceil `() : {`*nokia.maps.util.Point*`}` This method creates a new point whose x and y coordinates are obtained by rounding up the coordinates of the given point.
clone `() : {`*nokia.maps.util.Point*`}` This method creates a exact clone of the given point.
distance `(other) : {Number}`

www.EngineeringBooksPdf.com

Methods

This method gets the distance to another point.

divide (divisor) : {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates are obtained by dividing the coordinates of the given points by given divisor.

equals (other) : {Boolean}

This method checks if the given point is equal to the point supplied by the caller.

floor () : {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates are obtained by rounding down the coordinates of the given point.

getNearest (first, second) : {*nokia.maps.util.Point*}

This method calculates a point on the line defined by the two points provided by the caller such that calculated point lies nearest to the given point.

isCoveredBy (path, lineWidth, closed) : {String | Boolean}

This method checks if the point is covered by the given polygon.

len () : {Number}

This method calculates the distance between the origin and the origin (x: 0, y: 0).

max (other) : {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates are the largest values selected from the given point and the point supplied by the caller.

min (other) : {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates are the smallest values selected from the given point and the point supplied by the caller.

modulo (divisor) : {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates are obtained through modulo division of the coordinates of the given point by the divisor supplied by the caller.

multiply (multiplier) : {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates are obtained by multiplying the coordinates of the given point by given multiplier.

round () : {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates are obtained by rounding of the coordinates of the given point.

span (other) : {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates represent the span (absolute delta) between the given point and the point supplied by the caller.

www.EngineeringBooksPdf.com

Methods
sub (other) : {*nokia.maps.util.Point*}
This method gets a new point by subtracting the point supplied by the caller from the given point.
toString () : {String}
This method creates a textual representation of the given point.
validate () : {Boolean}
This method checks if the x and y coordinates are valid numbers.

Class Description

This class represents a location within a two-dimensional space.

Constructor Details

nokia.maps.util.Point(x, y)

Parameters:

x:	{Number}
	The x coordinate of the location
y:	{Number}
	The y coordinate of the location

Property Details

static **isCoveredBy**: {String | Boolean}

This method checks if the x/y coordinate is covered by the given shape.

Method Details

add(other): {*nokia.maps.util.Point*}

This method obtains the sum of the given point and the point supplied by the caller.

Parameters:

other:	{*nokia.maps.util.IPoint*}

www.EngineeringBooksPdf.com

A point which is to be added to the given point

Returns:

{*nokia.maps.util.Point*}

The new point representing a sum of the given point and that supplied by the caller

ceil(): {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates are obtained by rounding up the coordinates of the given point.

Returns:

{*nokia.maps.util.Point*}

The rounded point

clone(): {*nokia.maps.util.Point*}

This method creates a exact clone of the given point.

Returns:

{*nokia.maps.util.Point*}

An object representing the cloned point

distance(other): {Number}

This method gets the distance to another point.

Parameters:

other: {*nokia.maps.util.IPoint*}

Another point

Returns:

www.EngineeringBooksPdf.com

{Number}	The distance between the points

divide(divisor): {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates are obtained by dividing the coordinates of the given points by given divisor.

Parameters:

divisor:	{Number}
	The divisor to use

Returns:

{*nokia.maps.util.Point*}	
	The point resulting from the division

equals(other): {Boolean}

This method checks if the given point is equal to the point supplied by the caller.

Parameters:

other:	{*nokia.maps.util.IPoint*}
	Another point to compare

Returns:

{Boolean}	true if equal, otherwise false

floor(): {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates are obtained by rounding down the coordinates of the given point.

Returns:

{*nokia.maps.util.Point*}

www.EngineeringBooksPdf.com

The new point

getNearest(first, second): {*nokia.maps.util.Point*}

This method calculates a point on the line defined by the two points provided by the caller such that calculated point lies nearest to the given point.

Parameters:

first: {*nokia.maps.util.IPoint*}

First point on the line

second: {*nokia.maps.util.IPoint*}

Second point on the line

Returns:

{*nokia.maps.util.Point*}

The point on the line that lies nearest to the given point

isCoveredBy(path, lineWidth, closed): {String | Boolean}

This method checks if the point is covered by the given polygon.

Parameters:

path: {Number[]}

The path of a polygon; the closing leg is not required

lineWidth: {Number}

The width of the line

closed: {Boolean} [optional, default: false]

A Boolean indicating if the path should be treated as closed (polygon)

Returns:

www.EngineeringBooksPdf.com

{String | Boolean}	false, if the point is not covered by the supplied polygon, otherwise a letter that indicates which part of the polygon covers the point: • "V" a vertex • "E" a edge • "S" the surface

len(): {Number}

This method calculates the distance between the origin and the origin (x: 0, y: 0).

Returns:

{Number}	The distance between the origin and the given point

max(other): {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates are the largest values selected from the given point and the point supplied by the caller.

Parameters:

other:	{*nokia.maps.util.IPoint*} Another point

Returns:

{*nokia.maps.util.Point*}	The new point

min(other): {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates are the smallest values selected from the given point and the point supplied by the caller.

Parameters:

other:	{*nokia.maps.util.IPoint*}

www.EngineeringBooksPdf.com

Another point

Returns:

{*nokia.maps.util.Point*}

The new point

modulo(divisor): {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates are obtained through modulo division of the coordinates of the given point by the divisor supplied by the caller.

Parameters:

`divisor:` {Number}

The divisor to use

Returns:

{*nokia.maps.util.Point*}

The new point

multiply(multiplier): {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates are obtained by multiplying the coordinates of the given point by given multiplier.

Parameters:

`multiplier:` {Number}

The multiplier to use

Returns:

{*nokia.maps.util.Point*}

The point resulting from applying the multiplier to the given point

www.EngineeringBooksPdf.com

round(): {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates are obtained by rounding of the coordinates of the given point.

Returns:

{*nokia.maps.util.Point*}

The new point

span(other): {*nokia.maps.util.Point*}

This method creates a new point whose x and y coordinates represent the span (absolute delta) between the given point and the point supplied by the caller.

Parameters:

other: {*nokia.maps.util.IPoint*}

Another point

Returns:

{*nokia.maps.util.Point*}

The new point

sub(other): {*nokia.maps.util.Point*}

This method gets a new point by subtracting the point supplied by the caller from the given point.

Parameters:

other: {*nokia.maps.util.IPoint*}

The point to subtract from the given point

Returns:

{*nokia.maps.util.Point*}

A point resulting from the subtraction

here

www.EngineeringBooksPdf.com

toString(): {String}

This method creates a textual representation of the given point.

Returns:

{String}	The textual representation of the point

validate(): {Boolean}

This method checks if the x and y coordinates are valid numbers.

Returns:

{Boolean}	true if the coordinates are valid, otherwise false.

Class: Rectangle

This class is a member of ***nokia.maps.util***.

Class Summary

This class represents a rectangular area in a two-dimensional coordinate space.

[*For full details, see nokia.maps.util.Rectangle*]

Table 218: Property Summary

Properties
bottomRight: {*nokia.maps.util.Point*} This property holds a Point object that contains the coordinates of the lower right corner of the given rectangle.
topLeft: {*nokia.maps.util.Point*} This property holds a Point object that contains the coordinates of the upper left corner of the given rectangle.

Table 219: Method Summary

Methods
addPoint (point) : {*nokia.maps.util.Rectangle*} This method computes a wider rectangle that covers the point specified by the caller.
addPoints (points) : {*nokia.maps.util.Rectangle*} This method widens the given rectangle so that it covers the points provided by the caller.

www.EngineeringBooksPdf.com

Methods
centerTo (point) : {*nokia.maps.util.Rectangle*} This method widens the rectangle so that the given point lies in its center.
clone () : {*nokia.maps.util.Rectangle*} This method obtains a clone of the given rectangle.

Class Description

This class represents a rectangular area in a two-dimensional coordinate space. The area is defined in terms of its top-left and bottom-right corners specified via instances of `nokia.maps.util.Point`.

Constructor Details

`nokia.maps.util.Rectangle(points)`

This method creates an instance of the class on the basis of the point objects provided by the caller.

Parameters:

`points`:	{*nokia.maps.util.Point*[]} A list containing at least one point; the the created rectangle contains all the received points

Throws:

`{Error}`	Indicates that the `points` is empty.

Property Details

`bottomRight`: {*nokia.maps.util.Point*}

This property holds a `Point` object that contains the coordinates of the lower right corner of the given rectangle.

`topLeft`: {*nokia.maps.util.Point*}

This property holds a `Point` object that contains the coordinates of the upper left corner of the given rectangle.

www.EngineeringBooksPdf.com

Method Details

addPoint(point): {*nokia.maps.util.Rectangle*}

This method computes a wider rectangle that covers the point specified by the caller.

Parameters:

point: {*nokia.maps.util.Point*}

The point to cover

Returns:

{*nokia.maps.util.Rectangle*}

A reference to the newly computed rectangle

addPoints(points): {*nokia.maps.util.Rectangle*}

This method widens the given rectangle so that it covers the points provided by the caller.

Parameters:

points: {*nokia.maps.util.Point*[]}

An array of points to cover

Returns:

{*nokia.maps.util.Rectangle*}

A reference to the given rectangle

centerTo(point): {*nokia.maps.util.Rectangle*}

This method widens the rectangle so that the given point lies in its center.

Parameters:

point: {*nokia.maps.util.Point*}

The intended center of the rectangle

www.EngineeringBooksPdf.com

Returns:

{*nokia.maps.util.Rectangle*}

A reference to the given rectangle

`clone(): {nokia.maps.util.Rectangle}`

This method obtains a clone of the given rectangle.

Returns:

{*nokia.maps.util.Rectangle*}

A clone of the given rectangle

Class: Strip

This class is a member of ***nokia.maps.util***.

Class Summary

This class represents a special array that contains objects, all of the same type, and each with the same properties.

[*For full details, see nokia.maps.util.Strip*]

Table 220: Property Summary

Properties
data: {Object[]} This property holds the array values.
static constant ***LAT_LNG***: {*nokia.maps.util.Strip*} This property is a template for ["latitude", "longitude"] strips.
names: {String[]} This property holds an array of the names of the properties defined on each of the objects in the strip.
offsets: {Object} This hashtable holds the relative offset of each object property held in the array (from 0 to n-1).
static constant ***X_Y***: {*nokia.maps.util.Strip*} This property is a template for ["x", "y"] strips.

www.EngineeringBooksPdf.com

Table 221: Method Summary

Methods
`static` ***`stencil`*** `(template, data)` This method creates a new instance of `Strip` by reusing the meta data of an existing strip object and an optional data array.

Class Description

This class represents a special array that contains objects, all of the same type, and each with the same properties. The objects are not added to the array as objects, but instead the array contains just the values of the properties of the objects. Each object is allocated one slot in the array for every property it contains. For example, if each object in the array has two properties called "x" and "y", then the length of the array is twice the number of objects added to it.

Constructor Details

`nokia.maps.util.Strip(names, data)`

This method creates a new instance of the class, using the arguments provided by the caller.

Parameters:

`names`:	`{String[]}` An array of strings holding the names of objects
`data`:	`{Object[]}` [optional, default: []] An array holding the property values for each of the objects identified in the to `names` argument

Property Details

`data: {Object[]}`

This property holds the array values. To get the number of objects contained in the array, the length of the data array must be divided by the length of the names property, so:

```
size = arr.data.length / arr.names.length;
```

`static constant LAT_LNG: {nokia.maps.util.Strip}`

This property is a template for ["latitude", "longitude"] strips.

www.EngineeringBooksPdf.com

names: {String[]}

This property holds an array of the names of the properties defined on each of the objects in the strip.

offsets: {Object}

This hashtable holds the relative offset of each object property held in the array (from 0 to n-1).

static constant **X_Y**: {*nokia.maps.util.Strip*}

This property is a template for ["x", "y"] strips.

Method Details

static **stencil**(template, data)

This method creates a new instance of Strip by reusing the meta data of an existing strip object and an optional data array.

Parameters:

template:	{*nokia.maps.util.Strip*} A Strip to be used as a template for creating a new instance of Strip
data:	{Object[]} [optional, default: []] An array of data with which to populate the new instance

Example:

```
         strip1 = new Strip(["foo", "bar"], foobar1);
        strip2 = Strip.stencil(strip1, foobar2);
```

Class: Vector3D

This class is a member of ***nokia.maps.util***.

www.EngineeringBooksPdf.com

Class Summary

This class represents a three dimensional vector.

[*For full details, see nokia.maps.util.Vector3D*]

Table 222: Property Summary

Properties
`readonly` ***x***`: {Number}` This property holds the x component of the vector.
`readonly` ***y***`: {Number}` This property holds the y component of the vector
`readonly` ***z***`: {Number}` This property holds the z component of the vector.

Table 223: Method Summary

Methods
add `(other) : {`*nokia.maps.util.Vector3D*`}` This method creates the sum of the given vector and the vector provided by the caller.
angle `(px, py, intertX, intertY) : {Number}` This method retrieves the angle of the given vector in decimal degrees to the given point within a coordinate system in which the highest (positive) values are in the top right.
divide `(other) : {`*nokia.maps.util.Vector3D*`}` This method creates vector that represents the quotient obtained by dividing the given vector by the one supplied by the caller.
dot `(other) : {Number}` This method creates the dot product of the given vector and the one provided by the caller.
magnitude `() : {Number}` This method calculates the length of the given vector.
multiply `(other) : {`*nokia.maps.util.Vector3D*`}` This method creates a vector that represents the product of the given vector and the one provided by the caller.
normal `(other) : {`*nokia.maps.util.Vector3D*`}` This method creates the normal vector of the plane between the given vector and the one provided by the caller.
normalize `() : {`*nokia.maps.util.Vector3D*`}`

www.EngineeringBooksPdf.com

Methods
This method creates normalized representation of the given vector.
subtract (other) : {*nokia.maps.util.Vector3D*} This method creates a vector that represents the difference between the given vector and the vector supplied by the caller.

Class Description

This class represents a three dimensional vector.

Property Details

`readonly` **`x`**`: {Number}`

This property holds the x component of the vector.

`readonly` **`y`**`: {Number}`

This property holds the y component of the vector

`readonly` **`z`**`: {Number}`

This property holds the z component of the vector.

Method Details

`add``(other): {`*`nokia.maps.util.Vector3D`*`}`

This method creates the sum of the given vector and the vector provided by the caller.

Parameters:

`other`: {*nokia.maps.util.Vector3D*}

The vector to be added

Returns:

{*nokia.maps.util.Vector3D*}

A vector representing the sum of the given vector and the vector supplied by the caller

www.EngineeringBooksPdf.com

angle(px, py, intertX, intertY): {Number}

This method retrieves the angle of the given vector in decimal degrees to the given point within a coordinate system in which the highest (positive) values are in the top right.

For screen coordinates, the y-axis must be inverted. For a normalized vector, the method can be called without parameters to return its normalized angle.

Parameters:

px:	{Number} [optional, default: 0] The x-coordinate of the point to which the angle is to be calculated; if not provided zero is used
py:	{Number} [optional, default: 0] The y-coordinate of the point to which the angle is to be calculated; if not provided zero is used
intertX:	{Boolean} [optional, default: false] If provided and true, the x-axis is inverted, therefore the coordinates are increasing to the left and decreasing to the right
intertY:	{Boolean} [optional, default: false] If provided and true, the y-axis is inverted, therefore the coordinates are increasing to the bottom and decreasing to the top

Returns:

{Number}	The angle of this vector in degrees, relative to the given coordinate

divide(other): {*nokia.maps.util.Vector3D*}

This method creates vector that represents the quotient obtained by dividing the given vector by the one supplied by the caller.

Parameters:

other:	{*nokia.maps.util.Vector3D*}

www.EngineeringBooksPdf.com

The vector by which divide the given vector

Returns:

{*nokia.maps.util.Vector3D*}

A vector representing a quotient of the division of the given vector by the one supplied by the caller

dot(other): {Number}

This method creates the dot product of the given vector and the one provided by the caller.

Parameters:

other: {*nokia.maps.util.Vector3D*}

The vector with which the given vector is to be dot-multiplied

Returns:

{Number} The dot product of the two vectors

magnitude(): {Number}

This method calculates the length of the given vector.

Returns:

{Number} The length of this vector

multiply(other): {*nokia.maps.util.Vector3D*}

This method creates a vector that represents the product of the given vector and the one provided by the caller.

Parameters:

other: {*nokia.maps.util.Vector3D*}

The vector to be multiplied

www.EngineeringBooksPdf.com

Returns:

{*nokia.maps.util.Vector3D*}

A vector resulting from the multiplication of the given vector by the one supplied by the caller

normal(other): {*nokia.maps.util.Vector3D*}

This method creates the normal vector of the plane between the given vector and the one provided by the caller.

Parameters:

other: {*nokia.maps.util.Vector3D*}

The vector provided by the caller

Returns:

{*nokia.maps.util.Vector3D*}

The normal vector of the plane between the given vector and that provided by the caller

normalize(): {*nokia.maps.util.Vector3D*}

This method creates normalized representation of the given vector.

Returns:

{*nokia.maps.util.Vector3D*}

The normalized representation (length = 1) of th vector

subtract(other): {*nokia.maps.util.Vector3D*}

This method creates a vector that represents the difference between the given vector and the vector supplied by the caller.

Parameters:

www.EngineeringBooksPdf.com

other: {*nokia.maps.util.Vector3D*}

The vector to be subtracted from the given vector

Returns:

{*nokia.maps.util.Vector3D*}

A vector resulting from the subtraction

Namespace: places

This namespace is a member of ***nokia***.

Namespace Summary

This namespace defines the namespaces, classes and functions that make up the Places API.

Namespace Description

This namespace defines the namespaces, classes and functions that make up the Places API. It includes both the UI API, with widgets and methods that display place-related data, and a data-only API which defines the data structures for place-related information as well as functions to obtain that data.

Namespace: comm

This namespace is a member of ***nokia.places***.

Namespace Summary

This namespace defines a JSONP communication module.

Namespace Description

This namespace defines a JSONP communication module.

Namespace: data

This namespace is a member of ***nokia.places.comm***.

www.EngineeringBooksPdf.com

Namespace Summary

Holds functions responsible for data retrieval and sending to and from the server.

Table 224: Method Summary

Methods
abortRequest `(callbackId)` Function aborts request for passed request ID.

Namespace Description

Holds functions responsible for data retrieval and sending to and from the server.

Method Details

`abortRequest``(callbackId)`

Function aborts request for passed request ID.

Parameters:

`callbackId`: `{Number}`

request id previously returned by manager functions @see nokia.places.manager , @see nokia.places.search.manager

Namespace: manager

This namespace is a member of ***`nokia.places`***.

Namespace Summary

The namespace `nokia.places.manager` defines functions that communicate with the Places server to get and post place-related data.

Table 225: Method Summary

Methods
`getImages` `(params)` This function retrieves images for place.
`getPlaceData` `(params)`

www.EngineeringBooksPdf.com

Methods
This function retrieves place data for a place identified by the caller.
~~***getRating*** ~~~~(params)~~~~~~ This function retrieves place ratings for the given place id.
getReviews (params) This function retrieves reviews for the given place id.

Namespace Description

The namespace `nokia.places.manager` defines functions that communicate with the Places server to get and post place-related data. The functions require a place id that can be obtained by performing searches via *nokia.places.search.manager*.

Method Details

`getImages(params)`

This function retrieves images for place.

Parameters:

`params`: `{Object}`

An object containing the following request parameters:

- placeId {String} - id of a place (from *nokia.places.objects.Place*), required
- onComplete {Function} - a function to be called when the request has been completed, required; the function must accept as arguments `responseData` and `status` described under *Returns* below
- start {Number} - the starting offset for results, optional
- limit {Number} - maximum number of results to be returned, optional

Returns:

The return value is made available asynchronously as an argument passed to the `onComplete` handler and it is a list (*nokia.places.objects.List*) of elements of the type *nokia.places.objects.Media.Image*; `onComplete`'s second argument is `status`, a `String` constant with the value of 'OK' to indicate success or 'ERROR' to indicate request failure or time-out. Directly func-

www.EngineeringBooksPdf.com

tion also returns a number which is the request ID and can be used to cancel/abort the current request with nokia.places.comm.data.abortRequest

`getPlaceData(params)`

This function retrieves place data for a place identified by the caller.

Parameters:

`params:` `{Object}`

An object containing request parameters:

- placeId {String} - the id of a place (from *nokia.places.objects.Place*); note that `placeId` is optional, but if it is not provided `href` must be supplied
- href {String} - the URL of a place or location which may be obtained from the Search Result *nokia.places.objects.SearchResult*; note that `href` is optional, but if it is not provided `placeId` must be supplied
- onComplete {Function} - a function to be called when the request has been completed, required; the function must accept as arguments `responseData`, which is a place object *nokia.places.objects.Place* containing data returned by the Places back-end, and `status`, which is a `String` constant with the value of 'OK' to indicate success or 'ERROR' to indicate request failure or time-out

Returns:

The return value is made available asynchronously as an argument passed to the `onComplete` handler and it is a place object *nokia.places.objects.Place*; note that `onComplete` also receives a second argument indicating the status of the request (see also description of `onComplete` under `getPlaceData()` Parameters above). Directly function also returns a number which is the request ID and can be used to cancel/abort the current request with nokia.places.comm.data.abortRequest

~~`getRating(params)`~~

This function retrieves place ratings for the given place id.

www.EngineeringBooksPdf.com

Deprecated: this function is has been deprecated please use *nokia.places.manager#getPlaceData* and read rating from the response object

Returns:

The return value is made available asynchronously as an argument passed to the `onComplete` handler and it is a rating object, for example, {average:4, count: 120} (see also *nokia.places.objects.Media.Review*); `onComplete` also receives a second argument, `status`, which is a `String` constant with the value of 'OK' to indicate success or 'ERROR' to indicate request failure or time-out. Directly function also returns a number which is the request ID and can be used to cancel/abort the current request with nokia.places.comm.data.abortRequest

`getReviews(params)`

This function retrieves reviews for the given place id.

Parameters:

`params`: `{Object}`

An object containing the following parameters:

- placeId {String} - id of a place (from *nokia.places.objects.Place*), required
- onComplete {Function} - a function to be called when the request has been completed, required; the function must accept as arguments `responseData` and `status` described under *Returns* below
- start {Number} - optional result start offset
- limit {Number} - optional limit of returned results

Returns:

The return value is made available asynchronously as an argument passed to the `onComplete` handler and it is a list (*nokia.places.objects.List*) of elements of the type nokia.places.objects.Review; `onComplete` also receives a second argument, `status`, which is a `String` constant with the value of 'OK' to indicate success or 'ERROR' to indicate request fail-

www.EngineeringBooksPdf.com

ure or time-out. Directly function also returns a number which is the request ID and can be used to cancel/abort the current request with nokia.places.comm.data.abortRequest

Namespace: objects

This namespace is a member of ***nokia.places***.

Namespace Summary

This namespace defines data entities used by the Places APIs.

Namespace Description

This namespace defines data entities used by the Places APIs.

Namespace: Category

This namespace is a member of ***nokia.places.objects***.

Namespace Summary

This namespace represents a category as a data structure.

Table 226: Property Summary

Properties
categoryId: This property holds the unique id of the category.
icon: This property holds the URL of the category icon.
name: This property holds a localized category name.

Namespace Description

This namespace represents a category as a data structure.

www.EngineeringBooksPdf.com

Property Details

`categoryId`:

This property holds the unique id of the category.

`icon`:

This property holds the URL of the category icon.

`name`:

This property holds a localized category name.

Namespace: List

This namespace is a member of ***`nokia.places.objects`***.

Namespace Summary

This class represents a list object model.

Table 227: Property Summary

Properties
`available`: This property holds a count of items in the list.
`items`: This property holds the list data.

Table 228: Method Summary

Methods
`getNext` `(params)` This function retrieves next page for the list.

Namespace Description

This class represents a list object model.

www.EngineeringBooksPdf.com

Property Details

`available`:

This property holds a count of items in the list.

`items`:

This property holds the list data. It is an array of objects (all of the same type).

Method Details

`getNext``(params)`

This function retrieves next page for the list. This function exists only if there are further pages.

Parameters:

`params`: `{Object}`

An object containing request parameters:

- `onComplete` - {Function}, a function to be called when the request has completed, required; the function must accept as arguments:
  - `responseData` - an instance of *`nokia.places.objects.List`* containing data returned by the Places back-end
  - `status` - {String}, a constant, with the value of 'OK' to indicate success or 'ERROR' to indicate request failure or time-out

Returns:

The return value is made available asynchronously as arguments passed to the `onComplete` handler; the `responseData` argument contains the returned list, which is an instance of *nokia.places.objects.List*

Namespace: Media

This namespace is a member of ***`nokia.places.objects`***.

Namespace Summary

This property holds a list of media as an array.

www.EngineeringBooksPdf.com

Namespace Description

This property holds a list of media as an array. It is a list (*nokia.places.objects.List*) whose members are instances of *nokia.places.objects.Media*. The media object contains, where available, the following third-party content as properties:

- editorials
- images
- links
- reviews

All media properties are collections of objects. If there is no content of a given type, the property for that type is not present. If there is no third party content at all, the media property is not present.

Namespace: Editorial

This namespace is a member of ***nokia.places.objects.Media***.

Namespace Summary

This class provides an object definition for an editorial associated with a place.

Table 229: Property Summary

Properties
attribution: This property contains the attribution text for the given media item.
description: This property holds a description of the editorial.
language: (Optional) This property holds an ISO 639 language code indicating the language of the editorial.

Namespace Description

This class provides an object definition for an editorial associated with a place.

Property Details

attribution:

This property contains the attribution text for the given media item.

www.EngineeringBooksPdf.com

description:

This property holds a description of the editorial.

language:

(Optional) This property holds an ISO 639 language code indicating the language of the editorial.

Namespace: supplier

This namespace is a member of ***nokia.places.objects.Media.Editorial***.

Namespace Summary

This property holds information about the media object supplier (see also *nokia.places.objects.Place.supplier*.

Table 230: Property Summary

Properties
icon: This property contains the URL of the supplier's logo/icon.
name: This property contains a descriptive name of the data provider for display purposes.
supplierId: This property contains a key that uniquely identifies the data provider for a place.

Namespace Description

This property holds information about the media object supplier (see also *nokia.places.objects.Place.supplier*. An instance of this class is an element of *nokia.places.objects.Media*.

Property Details

icon:

This property contains the URL of the supplier's logo/icon.

www.EngineeringBooksPdf.com

name:

This property contains a descriptive name of the data provider for display purposes.

supplierId:

This property contains a key that uniquely identifies the data provider for a place.

Namespace: via

This namespace is a member of ***nokia.places.objects.Media.Editorial***.

Namespace Summary

This property holds a link object pointing to the origin of the information, usually on a Web site of the supplier.

Table 231: Property Summary

Properties
href: This property contains a URL pointing to the origin of the place information, usually on a Web site of the supplier.
icon: This property contains the URL of logo/icon associated with the origin.
id: This property contains a key that uniquely identifies the origin of the place data.
title: This property contains a descriptive name of the origin of the place data.

Namespace Description

This property holds a link object pointing to the origin of the information, usually on a Web site of the supplier.

Property Details

href:

This property contains a URL pointing to the origin of the place information, usually on a Web site of the supplier.

www.EngineeringBooksPdf.com

`icon`:

This property contains the URL of logo/icon associated with the origin.

`id`:

This property contains a key that uniquely identifies the origin of the place data.

`title`:

This property contains a descriptive name of the origin of the place data.

Namespace: Image

This namespace is a member of ***`nokia.places.objects.Media`***.

Namespace Summary

This class provides an object definition for an image associated with a place.

Table 232: Property Summary

Properties
`attribution`: This property contains the attribution text for this media
`src`: This property holds the URL of the media resource represented by the given object, for example, the URL of an image.

Namespace Description

This class provides an object definition for an image associated with a place.

Property Details

`attribution`:

This property contains the attribution text for this media

www.EngineeringBooksPdf.com

src:

This property holds the URL of the media resource represented by the given object, for example, the URL of an image.

Namespace: supplier

This namespace is a member of ***nokia.places.objects.Media.Image***.

Namespace Summary

This property holds information about the media object supplier (see also *nokia.places.objects.Place.supplier*.

Table 233: Property Summary

Properties
icon: This property contains the URL of the supplier's logo/icon.
name: This property contains a descriptive name of the data provider for display purposes.
supplierId: This property contains a key that uniquely identifies the data provider for a place.

Namespace Description

This property holds information about the media object supplier (see also *nokia.places.objects.Place.supplier*. An instance of this class is an element of *nokia.places.objects.Media*.

Property Details

icon:

This property contains the URL of the supplier's logo/icon.

name:

This property contains a descriptive name of the data provider for display purposes.

www.EngineeringBooksPdf.com

supplierId:

This property contains a key that uniquely identifies the data provider for a place.

Namespace: via

This namespace is a member of ***nokia.places.objects.Media.Image***.

Namespace Summary

This property holds a link object pointing to the origin of the information, usually on a Web site of the supplier.

Table 234: Property Summary

Properties
href: This property contains a URL pointing to the origin of the information, usually on a Web site of the supplier.
icon: This property contains the URL of the origin's logo/icon.
id: This property contains a key that uniquely identifies the origin of the place data.
title: This property contains a descriptive name of the origin of the place information.

Namespace Description

This property holds a link object pointing to the origin of the information, usually on a Web site of the supplier.

Property Details

href:

This property contains a URL pointing to the origin of the information, usually on a Web site of the supplier.

icon:

This property contains the URL of the origin's logo/icon.

www.EngineeringBooksPdf.com

id:

This property contains a key that uniquely identifies the origin of the place data.

title:

This property contains a descriptive name of the origin of the place information.

Namespace: Link

This namespace is a member of ***nokia.places.objects.Media***.

Namespace Summary

This class provides an object definition for a link associated with a place.

Table 235: Property Summary

Properties
title: This property holds the link title.
url: This property holds the URL of the link.

Namespace Description

This class provides an object definition for a link associated with a place.

Property Details

title:

This property holds the link title.

url:

This property holds the URL of the link.

Namespace: supplier

www.EngineeringBooksPdf.com

This namespace is a member of ***nokia.places.objects.Media.Link***.

Namespace Summary

This property holds information about the media object supplier (see also *nokia.places.objects.Place.supplier*.

Table 236: Property Summary

Properties
icon: This property contains the URL of the supplier's logo/icon.
name: This property contains a descriptive name of the data provider for display purposes.
supplierId: {String} This property contains a key that uniquely identifies the data provider for a place.

Namespace Description

This property holds information about the media object supplier (see also *nokia.places.objects.Place.supplier*. An instance of this class is an element of *nokia.places.objects.Media*.

Property Details

icon:

This property contains the URL of the supplier's logo/icon.

name:

This property contains a descriptive name of the data provider for display purposes.

supplierId: {String}

This property contains a key that uniquely identifies the data provider for a place.

www.EngineeringBooksPdf.com

Namespace: Review

This namespace is a member of ***nokia.places.objects.Media***.

Namespace Summary

This class represents a single place review element.

Table 237: Property Summary

Properties
attribution: This property holds a ready-to-display string containing the attribution text for the editorial
date: This property holds the date of the review.
description: This property holds a description of the review.
language: (Optional) This property holds an ISO 639 language code indicating what language the review is in.
rating: This property holds the rating value for this place, integer values from 1 to 5 inclusive
title: (Optional) This property holds the review title.

Namespace Description

This class represents a single place review element.

Property Details

`attribution`:

This property holds a ready-to-display string containing the attribution text for the editorial

`date`:

This property holds the date of the review.

www.EngineeringBooksPdf.com

description:

This property holds a description of the review.

language:

(Optional) This property holds an ISO 639 language code indicating what language the review is in.

rating:

This property holds the rating value for this place, integer values from 1 to 5 inclusive

title:

(Optional) This property holds the review title.

Namespace: supplier

This namespace is a member of ***nokia.places.objects.Media.Review***.

Namespace Summary

This property holds information about the media object supplier (see also *nokia.places.objects.Place.supplier*.

Table 238: Property Summary

Properties
icon: This property contains the URL of the supplier's logo/icon.
name: This property contains a descriptive name of the data provider for display purposes.
supplierId: This property contains a key that uniquely identifies the data provider for a place.

www.EngineeringBooksPdf.com

Namespace Description

This property holds information about the media object supplier (see also *nokia.places.objects.Place.supplier*. An instance of this class is an element of *nokia.places.objects.Media*.

Property Details

icon:

This property contains the URL of the supplier's logo/icon.

name:

This property contains a descriptive name of the data provider for display purposes.

supplierId:

This property contains a key that uniquely identifies the data provider for a place.

Namespace: user

This namespace is a member of ***nokia.places.objects.Media.Review***.

Namespace Summary

This property holds information about the reviewer.

Table 239: Property Summary

Properties
href: (Optional) This property holds a link to the user's profile page.
icon: (Optional) This property holds a link to the user's icon.
name: This property holds the user name of the reviewer.
type: This property holds the type of the linked profile page.

www.EngineeringBooksPdf.com

Namespace Description

This property holds information about the reviewer.

Property Details

`href`:

(Optional) This property holds a link to the user's profile page.

`icon`:

(Optional) This property holds a link to the user's icon.

`name`:

This property holds the user name of the reviewer.

`type`:

This property holds the type of the linked profile page.

Namespace: via

This namespace is a member of ***`nokia.places.objects.Media.Review`***.

Namespace Summary

This property holds a link object pointing to the origin of the information, usually on a Web site of the supplier.

Table 240: Property Summary

Properties
`href`: This property contains a URL pointing to the origin of the information, usually on a Web site of the supplier.
`icon`: This property contains the URL of the origin's logo/icon.
`id`: This property contains a key that uniquely identifies the origin of the place data.

www.EngineeringBooksPdf.com

Properties
title:
This property contains a descriptive name of the origin of the place data.

Namespace Description

This property holds a link object pointing to the origin of the information, usually on a Web site of the supplier.

Property Details

`href`:

This property contains a URL pointing to the origin of the information, usually on a Web site of the supplier.

`icon`:

This property contains the URL of the origin's logo/icon.

`id`:

This property contains a key that uniquely identifies the origin of the place data.

`title`:

This property contains a descriptive name of the origin of the place data.

Namespace: Place

This namespace is a member of ***`nokia.places.objects`***.

Namespace Summary

This namespace represents a place as a data structure.

www.EngineeringBooksPdf.com

Table 241: Property Summary

Properties
alternativeNames:
This class defines an array of alternative names for the given place.
attribution:
This property contains the attribution text for the given place.
categories:
This is an array of categories, where the first item is the primary category.
icon:
This property contains the URL of the icon image for the given place.
name:
This property contains the translated name of a place.
placeId:
This property contains a unique identifier for a POI in the Places database.
verifiedByOwner:
This property has boolean value true if the place information has been verified by the owner
view:
This property contains a link to a representation of the place that can be viewed by end users.

Namespace Description

This namespace represents a place as a data structure. A structure of this type may be returned in response to searches, and may be used as a method argument or a return value.

Note that when a place structure contains search results, only those properties are present for which data are available. For example, if rating information is not available, `place.rating` is not included in the given instance of `nokia.places.objects.Place`.

Property Details

`alternativeNames`:

This class defines an array of alternative names for the given place. The class is an element of *`nokia.places.objects.Place`*.

www.EngineeringBooksPdf.com

attribution:

This property contains the attribution text for the given place. The property is optional.

categories:

This is an array of categories, where the first item is the primary category.

icon:

This property contains the URL of the icon image for the given place.

name:

This property contains the translated name of a place.

placeId:

This property contains a unique identifier for a POI in the Places database. This property is not available for street addresses.

verifiedByOwner:

This property has boolean value true if the place information has been verified by the owner

view:

This property contains a link to a representation of the place that can be viewed by end users.

Namespace: contacts

This namespace is a member of ***nokia.places.objects.Place***.

Namespace Summary

This class encapsulates contact information associated with a place (location).

www.EngineeringBooksPdf.com

Table 242: Property Summary

Properties
email: This property holds an array of e-mail addresses.
static ***fax***: This property holds an array of fax numbers.
phone: This property holds an array of phone numbers.
website: This property holds an array of website URLs.

Namespace Description

This class encapsulates contact information associated with a place (location). A place object always contains an array of contacts, where each element has the structure defined here. If only one contact is available, the array contains only one element. The class is an element of *nokia.places.objects.Place*.

Property Details

email:

This property holds an array of e-mail addresses. It is defined only when e-mail addresses for the given place are available. Every object stored in the array has 'value' and 'label' properties.

static fax:

This property holds an array of fax numbers. It is defined only when fax numbers for the given place are available. Every object stored in the array has 'value' and 'label' properties.

phone:

This property holds an array of phone numbers. It is defined only when phone numbers for the given place are available. Every object stored in the array has 'value' and 'label' properties.

website:

www.EngineeringBooksPdf.com

This property holds an array of website URLs. It is defined only when website URLs for the given place are available. Every object stored in the array has 'value' and 'label' properties.

Namespace: extended

This namespace is a member of ***nokia.places.objects.Place***.

Namespace Summary

This namespace defines an array of additional data relating to a place.

Table 243: Property Summary

Properties
label: This property holds a localized display label.
ltext: This property holds information ready to be displayed directly.

Namespace Description

This namespace defines an array of additional data relating to a place. The array is an element of *nokia.places.objects.Place*. It contains an extensible collection of attributes including `payment`, `openingHours`, `annualClosings`, `nearestLandmark`, `languagesSpoken`, `availableParking`, `smoking` and `disabledAccess`.

Property Details

`label`:

This property holds a localized display label.

`ltext`:

This property holds information ready to be displayed directly. If the text represents a list of items, the items are separated by a line break entity `<br />` (if the text format is HTML) or newline (if the contents is plain text).

Namespace: location

This namespace is a member of ***nokia.places.objects.Place***.

www.EngineeringBooksPdf.com

Namespace Summary

This class encapsulates location information.

Namespace Description

This class encapsulates location information. It contains elements such as `address` and `position`. The class is an element of *`nokia.places.objects.Place`*.

Namespace: address

This namespace is a member of ***`nokia.places.objects.Place.location`***.

Namespace Summary

This namespace represents an address and related data.

Table 244: Property Summary

Properties
`city`: This property contains a localized city name.
`country`: This property contains the localized name of a country.
`countryCode`: This property contains a country name represented by an ISO 3166-alpha-3 country code.
`county`: This property contains the name of a county.
`district`: This property contains a localized district name.
`floor`: This property contains a value indicating the floor (in a building) as part of the address.
`house`: This property contains a house number.
`postalCode`: This property contains the zip/postal code.
`state`:

www.EngineeringBooksPdf.com

Properties
This property contains the name or abbreviation of a state or province.
street: This property contains a street name.
text: This property contains the address formatted according to the local standards

Namespace Description

This namespace represents an address and related data. The namespace is an element of *nokia.places.objects.Place.location*.

Property Details

city:

This property contains a localized city name.

country:

This property contains the localized name of a country.

countryCode:

This property contains a country name represented by an ISO 3166-alpha-3 country code.

county:

This property contains the name of a county.

district:

This property contains a localized district name.

floor:

This property contains a value indicating the floor (in a building) as part of the address.

www.EngineeringBooksPdf.com

house:

This property contains a house number.

postalCode:

This property contains the zip/postal code.

state:

This property contains the name or abbreviation of a state or province.

street:

This property contains a street name.

text:

This property contains the address formatted according to the local standards

Namespace: media

This namespace is a member of ***nokia.places.objects.Place***.

Namespace Summary

This property holds a list of media objects associated with a place, which may be images, editorials, links or reviews.

Table 245: Property Summary

Properties
editorials: This property is a list (*nokia.places.objects.List*) of media objects whose member `items` contains instances of *nokia.places.objects.Media.Editorial*.
images:

www.EngineeringBooksPdf.com

Properties
This property is a list (*nokia.places.objects.List*) of media objects whose member `items` contains instances of *nokia.places.objects.Media.Image*.
links:
This property is a list (*nokia.places.objects.List*) of media objects whose member `items` contains instances of *nokia.places.objects.Media.Link*.
reviews:
This property is a list (*nokia.places.objects.List*) of media objects whose member `items` contains instances of *nokia.places.objects.Media.Review*.

Namespace Description

This property holds a list of media objects associated with a place, which may be images, editorials, links or reviews. All media properties are collections of objects. If there is no content of a particular type, the property for that type is not present in the `Place` object. If there is no third party content at all, the media property is not present.

Property Details

`editorials`:

This property is a list (*nokia.places.objects.List*) of media objects whose member `items` contains instances of *nokia.places.objects.Media.Editorial*.

`images`:

This property is a list (*nokia.places.objects.List*) of media objects whose member `items` contains instances of *nokia.places.objects.Media.Image*.

`links`:

This property is a list (*nokia.places.objects.List*) of media objects whose member `items` contains instances of *nokia.places.objects.Media.Link*.

`reviews`:

This property is a list (*nokia.places.objects.List*) of media objects whose member `items` contains instances of *nokia.places.objects.Media.Review*.

www.EngineeringBooksPdf.com

Namespace: position

This namespace is a member of ***nokia.places.objects.Place***.

Namespace Summary

This namespace holds the (location) coordinates for map markers.

Table 246: Property Summary

Properties
boundingBox: This property represents the bounding box which completely encloses the physical extent of the location.
latitude: This property holds the latitudinal coordinate of the position.
longitude: This property holds the longitudinal coordinate of the position.

Namespace Description

This namespace holds the (location) coordinates for map markers. The namespace is an element of *nokia.places.objects.Place.location*.

Property Details

boundingBox:

This property represents the bounding box which completely encloses the physical extent of the location. For further details, see: *nokia.maps.geo.BoundingBox*

latitude:

This property holds the latitudinal coordinate of the position.

longitude:

This property holds the longitudinal coordinate of the position.

www.EngineeringBooksPdf.com

Namespace: ratings

This namespace is a member of ***nokia.places.objects.Place***.

Namespace Summary

This class encapsulates rating data for a place.

Table 247: Property Summary

Properties
average : This property holds the average rating value for a place.
count : This property holds the number of the ratings submitted for a place.

Namespace Description

This class encapsulates rating data for a place. The class is an element of *nokia.places.objects.Place*.

Property Details

average :

This property holds the average rating value for a place.

count :

This property holds the number of the ratings submitted for a place.

Namespace: related

This namespace is a member of ***nokia.places.objects.Place***.

Namespace Summary

This class is designed to list places that may be of interest in relation to the given place, for example recommended places or services such as public transport, parking, etc.

www.EngineeringBooksPdf.com

Namespace Description

This class is designed to list places that may be of interest in relation to the given place, for example recommended places or services such as public transport, parking, etc. At present, only recommended places are supported.

If there are no related items, the property `related` is not present in the `Place` object.

The class is an element of *`nokia.places.objects.Place`*.

Namespace: recommended

This namespace is a member of ***`nokia.places.objects.Place.related`***.

Namespace Summary

This class holds a resource that represents recommended places.

Table 248: Property Summary

Properties
`href`: This property holds a URL of a list of recommended places.

Namespace Description

This class holds a resource that represents recommended places. The class is an element of *`nokia.places.objects.Place`*.

Property Details

`href`:

This property holds a URL of a list of recommended places.

Namespace: supplier

This namespace is a member of ***`nokia.places.objects.Place`***.

Namespace Summary

This class defines the supplier of the place information.

www.EngineeringBooksPdf.com

Table 249: Property Summary

Properties
icon: This property contains the URL of the supplier's logo icon.
name: This property contains a descriptive name of the data provider for display purposes.
supplierId: This property contains a key that uniquely identifies the data provider for a place.

Namespace Description

This class defines the supplier of the place information. The class is an element of *nokia.places.objects.Place*.

Property Details

icon:

This property contains the URL of the supplier's logo icon.

name:

This property contains a descriptive name of the data provider for display purposes.

supplierId:

This property contains a key that uniquely identifies the data provider for a place.

Namespace: SearchResponseView

This namespace is a member of ***nokia.places.objects***.

Namespace Summary

This class represents an object that holds the results of a search for places.

www.EngineeringBooksPdf.com

Namespace Description

This class represents an object that holds the results of a search for places.

Namespace: results

This namespace is a member of ***nokia.places.objects.SearchResponseView***.

Namespace Summary

This property holds the search results as an array named `items`.

Table 250: Property Summary

Properties
`static` ***items***: This property holds an (optional) array of search result objects see also *nokia.places.objects.SearchResult*.

Namespace Description

This property holds the search results as an array named `items`.

Property Details

`static` **`items`**:

This property holds an (optional) array of search result objects see also *nokia.places.objects.SearchResult*.

Namespace: search

This namespace is a member of ***nokia.places.objects.SearchResponseView***.

Namespace Summary

This class holds information indicating the location that was used as the search center - a location around which the search was conducted in widening circles.

Namespace Description

This class holds information indicating the location that was used as the search center - a location around which the search was conducted in widening circles.

www.EngineeringBooksPdf.com

Namespace: location

This namespace is a member of ***nokia.places.objects.SearchResponseView.search***.

Namespace Summary

This class holds location of the search center.

Namespace Description

This class holds location of the search center. A different search center can be used than the one provided.

Namespace: boundingBox

This namespace is a member of ***nokia.places.objects.SearchResponseView.search.location***.

Namespace Summary

This property holds the geographical coordinates of the top left and bottom right corners of a rectangle enclosing the area within which the search is conducted and, by implication, the area that encloses the search results.

Namespace Description

This property holds the geographical coordinates of the top left and bottom right corners of a rectangle enclosing the area within which the search is conducted and, by implication, the area that encloses the search results. When conducting searches, either `position` or `boundingBox` can be used.

Namespace: bottomRight

This namespace is a member of ***nokia.places.objects.SearchResponseView.search.location.boundingBox***.

Namespace Summary

This property holds the bottom right position of the bounding box.

Table 251: Property Summary

Properties
`static` ***latitude***`: {Number}`

www.EngineeringBooksPdf.com

Properties
This property holds the latitudinal coordinate of the bounding box's bottom right vertex.
`static` ***`longitude`***`: {Number}`
This property holds the longitudinal coordinate of the bounding box's bottom right vertex.

Namespace Description

This property holds the bottom right position of the bounding box.

Property Details

`static` **`latitude`**`: {Number}`

This property holds the latitudinal coordinate of the bounding box's bottom right vertex.

`static` **`longitude`**`: {Number}`

This property holds the longitudinal coordinate of the bounding box's bottom right vertex.

Namespace: topLeft

This namespace is a member of ***`nokia.places.objects.SearchResponseView.search.location.boundingBox`***.

Namespace Summary

This property holds the top left position of the bounding box.

Table 252: Property Summary

Properties
`static` ***`latitude`***`: {Number}`
This property holds the latitudinal coordinate of the bounding box's top left vertex.
`static` ***`longitude`***`: {Number}`
This property holds the longitudinal coordinate of the bounding box's top left vertex.

Namespace Description

This property holds the top left position of the bounding box.

www.EngineeringBooksPdf.com

Property Details

`static` **`latitude`**`: {Number}`

This property holds the latitudinal coordinate of the bounding box's top left vertex.

`static` **`longitude`**`: {Number}`

This property holds the longitudinal coordinate of the bounding box's top left vertex.

Namespace: position

This namespace is a member of ***`nokia.places.objects.SearchResponseView.search.location`***.

Namespace Summary

This class holds the coordinates (location) of the search center.

Table 253: Property Summary

Properties
`static` ***`latitude`***`: {Number}` This property holds the latitudinal coordinate of the search center.
`static` ***`longitude`***`: {Number}` This property holds the longitudinal coordinate of the search center.

Namespace Description

This class holds the coordinates (location) of the search center. Searches are run in widening circles around this location and the results are ordered by relevance to the search criteria. When conducting searches, either `position` or `boundingBox` can be used.

Property Details

`static` **`latitude`**`: {Number}`

This property holds the latitudinal coordinate of the search center.

`static` **`longitude`**`: {Number}`

This property holds the longitudinal coordinate of the search center.

www.EngineeringBooksPdf.com

Namespace: SearchResult

This namespace is a member of ***nokia.places.objects***.

Namespace Summary

This class represents a search result item.

Table 254: Property Summary

Properties
`static` ***averageRating***`: {Integer}` This property holds the average rating value for the place based on contributions by visitors.
`static` ***distance***`: {Integer}` This property holds the distance to the destination in meters.
`static` ***having***`: {Array}` This property holds an array indicating what information is available
`static` ***href***`: {String}` This property holds a URL to the resource represented by that result item (place) and can therefore be used to access the resource.
`static` ***icon***`: {String}` This property contains a URL to the icon for this place
`static` ***placeId***`: {String}` This property contains a unique identifier for a POI/street address in Places database.
`static` ***title***`: {String}` This property contains the translated name of a place.
`static` ***vicinity***`: {String}` This property holds the formatted address of the place.

Namespace Description

This class represents a search result item.

Property Details

`static` **`averageRating`**`: {Integer}`

www.EngineeringBooksPdf.com

This property holds the average rating value for the place based on contributions by visitors.

`static` **`distance`**`: {Integer}`

This property holds the distance to the destination in meters. This property is optional.

`static` **`having`**`: {Array}`

This property holds an array indicating what information is available

`static` **`href`**`: {String}`

This property holds a URL to the resource represented by that result item (place) and can therefore be used to access the resource.

`static` **`icon`**`: {String}`

This property contains a URL to the icon for this place

`static` **`placeId`**`: {String}`

This property contains a unique identifier for a POI/street address in Places database.

`static` **`title`**`: {String}`

This property contains the translated name of a place.

`static` **`vicinity`**`: {String}`

This property holds the formatted address of the place.

Namespace: category

This namespace is a member of ***`nokia.places.objects.SearchResult`***.

www.EngineeringBooksPdf.com

Namespace Summary

This class holds the category of the place.

Table 255: Property Summary

Properties
`static` ***`categoryId`***`: {String}` This property holds the unique id of the category.
`static` ***`icon`***`: {String}` This property holds the link to the category icon.
`static` ***`name`***`: {String}` This property holds a localized category name.

Namespace Description

This class holds the category of the place.

Property Details

`static` **`categoryId`**`: {String}`

This property holds the unique id of the category.

`static` **`icon`**`: {String}`

This property holds the link to the category icon.

`static` **`name`**`: {String}`

This property holds a localized category name.

Namespace: position

This namespace is a member of ***`nokia.places.objects.SearchResult`***.

Namespace Summary

This class holds the coordinates (location) of the place.

www.EngineeringBooksPdf.com

Table 256: Property Summary

Properties
`static` ***`latitude`***`: {Number}` This property holds the latitudinal coordinate of the position.
`static` ***`longitude`***`: {Number}` This property holds the longitudinal coordinate of the position.

Namespace Description

This class holds the coordinates (location) of the place. The class is an element of *`nokia.places.objects.Place.location`*.

Property Details

`static` **`latitude`**`: {Number}`

This property holds the latitudinal coordinate of the position.

`static` **`longitude`**`: {Number}`

This property holds the longitudinal coordinate of the position.

Namespace: SearchSuggestion

This namespace is a member of ***`nokia.places.objects`***.

Namespace Summary

This class represents a search suggestion.

Table 257: Property Summary

Properties
`static` ***`suggestions`***`: {Array}` This property holds an array of suggested search terms

Namespace Description

This class represents a search suggestion.

www.EngineeringBooksPdf.com

Property Details

`static` **`suggestions`**`: {Array}`

This property holds an array of suggested search terms

Namespace: search

This namespace is a member of ***`nokia.places`***.

Namespace Summary

This namespace defines a search manager for the Places API and associated functions.

Namespace Description

This namespace defines a search manager for the Places API and associated functions.

Namespace: manager

This namespace is a member of ***`nokia.places.search`***.

Namespace Summary

The namespace `nokia.places.search.manager` defines functions that allow you to use the Places search service to search for places and to obtain search suggestions.

Table 258: Method Summary

Methods
`findPlaces` `(params)` This function searches for places on the basis of the parameters specified by the caller.
`findPlacesByCategory` `(params)` This function searches for places by category.
`findRecommendations` `(params)` This function retrieves recommendations for the location indicated by the caller.
`geoCode` `(params)` This method runs a geocoding query based on the arguments provided by the caller.
`reverseGeoCode` `(params)`

www.EngineeringBooksPdf.com

Methods
This method runs a reverse geocoding query based on the coordinates provided by the caller.
suggestPlaces `(params)` This function retrieves suggestions that can be used with *`nokia.places.search.manager#findPlaces`*`()`.

Namespace Description

The namespace `nokia.places.search.manager` defines functions that allow you to use the Places search service to search for places and to obtain search suggestions. Searches for places can be viewed as a preliminary step to selecting a particular place for which to retrieve detailed information, using the functions defined on *nokia.places.manager*.

Method Details

`findPlaces(params)`

This function searches for places on the basis of the parameters specified by the caller.

Parameters:

`params`: `{Object}`

An object containing a number of parameters that define a search request:

- `{String} searchTerm` - search term, required
- `{Function} onComplete` - a function to be called when the request has been completed, required; the function must accept as arguments `responseData`, which is an instance of *nokia.places.objects.SearchResponseView* containing data returned by the Places back-end, and `status`, which is a {String} constant with the value of 'OK' to indicate success or 'ERROR' to indicate request failure or time-out
- `{Object} searchCenter` - an object containing the latitude and longitude of the starting point for the search (`{latitude:'', longitude:''}`); optional, if provided, `useGeoLocation` is ignored
- `{Object} boundingBox` - instead of search center boundingBox can be passed as a parameter. Bounding box is an object containing to coordinates topLeft and bottomRight (`{topLeft: {latitude:'', longitude:''}, bottomRight: {latitude:'', longitude''}}`)

www.EngineeringBooksPdf.com

- `{Boolean} useGeoLocation` - if `true` and `searchCenter` is not provided, Places search tries to use the W3C Geolocation API to get the client location and use it as the search center; if this parameter is `false` and `searchCenter` is not provided, a global search is executed
- `{Number} limit` - the maximum number of results to be returned, optional

Returns:

The return value is made available asynchronously as arguments passed to the `onComplete` handler; the `responseData` argument contains a response view (*nokia.places.objects.SearchResponseView*). Directly function also returns a number which is the request ID and can be used to cancel/abort the current request with nokia.places.comm.data.abortRequest

`findPlacesByCategory(params)`

This function searches for places by category.

Parameters:

`params`: `{Object}`

An object containing a number of parameters that define a search request:

- `{String} category` - required; a string constant containing the valid category id which must be set to one of the following values:
  - `eat-drink`
  - `going-out`
  - `sights-museums`
  - `transport`
  - `accommodation`
  - `shopping`
  - `leisure-outdoor`
  - `administrative-areas-buildings`
  - `natural-geographical`
- `{Function} onComplete` - required; a function to be called when the request has been completed; the function must ac-

www.EngineeringBooksPdf.com

cept as arguments `responseData`, which is an instance of *nokia.places.objects.SearchResponseView* containing data returned by the Places back-end, and `status`, which is a {String} constant with the value of 'OK' to indicate success or 'ERROR' to indicate request failure or time-out

- `{Object} searchCenter` - optional; an object containing the latitude and longitude of the starting point for the search (`{latitude:'', longitude:''}`); if this parameter is provided, `useGeoLocation` is ignored
- `{Object} boundingBox` - instead of search center boundingBox can be passed is a parameter. Bounding box is an object containing to coordinates topLeft and bottomRight (`{topLeft: {latitude:'', longitude:''}, bottomRight: {latitude:'', longitude''}}`)
- `{Boolean} useGeoLocation` - if `true` and `searchCenter` is not provided, Places search tries to use the W3C Geolocation API to get the client location and use it as the search center; if this parameter is `false` and `searchCenter` is not provided, a global search is executed
- `{Number} limit` - optional; the maximum number of results to be returned

Returns:

The return value is made available asynchronously as arguments passed to the `onComplete` handler; the `responseData` argument contains a response view *nokia.places.objects.SearchResponseView*. Directly function also returns a number which is the request ID and can be used to cancel/abort the current request with nokia.places.comm.data.abortRequest

`findRecommendations(params)`

This function retrieves recommendations for the location indicated by the caller.

Parameters:

`params`: `{Object}`

An object containing request parameters:

- `{String} placeId` - id of a place (from *nokia.places.objects.Place*)

www.EngineeringBooksPdf.com

- `{Number} limit` - the maximum number of recommended places to be returned
- `{Function} onComplete` - {Function}, a function to be called when the request has completed, required; the function must accept as arguments:
  - `responseData` - an instance of *`nokia.places.objects.SearchResponseView`* containing data returned by the Places back-end
  - `status` - {String}, a constant, with the value of 'OK' to indicate success or 'ERROR' to indicate request failure or time-out

Returns:

The return value is made available asynchronously as arguments passed to the `onComplete` handler; the `responseData` argument contains a response view, which is an instance of *nokia.places.objects.SearchResponseView*. Directly function also returns a number which is the request ID and can be used to cancel/abort the current request with nokia.places.comm.data.abortRequest

geoCode(params)

This method runs a geocoding query based on the arguments provided by the caller.

Parameters:

`params`: `{Object}`

an object containing:

- `address` - an object containing at least one of the elements of `nokia.places.objects.Place.location.address`; optional, if not provided the caller is expected to supply `searchTerm` described below
- `searchTerm` - a {String} identifying the location to be geocoded, for example, it can contain the name of the place or the full address, etc.; optional, if not provided, the caller is expected to supply `address` described above

www.EngineeringBooksPdf.com

- onComplete - {Function}, a function to be called when the request has completed, required; the function must accept as arguments:
  - responseData - an instance of *nokia.places.objects.Place* containing data returned by the Places back-end
  - status - {String}, a constant, with the value of 'OK' to indicate success or 'ERROR' to indicate request failure or time-out

Returns:

The return value is made available asynchronously as arguments passed to the onComplete handler; when status is 'OK', the argument responseData contains a place object, which is an instance of *nokia.places.objects.Place*. Directly function also returns a number which is the request ID and can be used to cancel/abort the current request with nokia.places.comm.data.abortRequest

reverseGeoCode(params)

This method runs a reverse geocoding query based on the coordinates provided by the caller. A default radius is applied.

Parameters:

params: {Object}

an object containing the coordinates to be used in a reverse geocoding query:

- latitude - {Number}, latitude in degrees in the range [-90 .. 90]; values outside this range result in failed queries
- longitude - {Number}, longitude in degrees in the range [-180 .. 180]; values outside this range result in failed queries
- onComplete - {Function}, a function to be called when the request has completed, required; the function must accept as arguments:
  - responseData - an instance of *nokia.places.objects.Place* containing data returned by the Places back-end
  - status - {String}, a constant, with the value of 'OK' to indicate success or 'ERROR' to indicate request failure or time-out

www.EngineeringBooksPdf.com

Returns:

The return value is made available asynchronously as arguments passed to the `onComplete` handler; when `status` is 'OK', the argument `responseData` contains a place object, which is an instance of *`nokia.places.objects.Place`* or an empty String if there is no address information available for selected coordinates. Directly function also returns a number which is the request ID and can be used to cancel/abort the current request with nokia.places.comm.data.abortRequest

`suggestPlaces``(params)`

This function retrieves suggestions that can be used with *`nokia.places.search.manager#findPlaces`*`()`.

Parameters:

`params`: `{Object}`

An object containing parameters that define a request for suggestions:

- `{String} searchTerm` - required; a suggestion query term
- `{Function} onComplete` - required; a function to be called when the request has been completed; the function must accept as arguments `responseData`, which is an instance of *nokia.places.objects.SearchResponseView* containing data returned by the Places back-end, and `status`, which is a {String} constant with the value of 'OK' to indicate success or 'ERROR' to indicate request failure or time-out
- `{Object} searchCenter` - optional; an object containing the latitude and longitude of the starting point for the search (`{latitude:'', longitude:''}`); if this parameter is provided, `useGeoLocation` is ignored
- `{Boolean} useGeoLocation` - if `true` and `searchCenter` is not provided, Places search tries to use the W3C Geolocation API to get the client location and use it as the search center; if this parameter is `false` and `searchCenter` is not provided, a global search is executed

Returns:

www.EngineeringBooksPdf.com

The return value is made available asynchronously via the argument `responseData` passed to the handler function `onComplete` as a response view object (*nokia.places.objects.SearchResponseView*). Directly function also returns a number which is the request ID and can be used to cancel/abort the current request with nokia.places.comm.data.abortRequest

Namespace: ui

This namespace is a member of ***nokia.places***.

Namespace Summary

This namespace provides functionality that supports templates used to create user interfaces and to display place data.

Namespace Description

This namespace provides functionality that supports templates used to create user interfaces and to display place data.

Class: Template

This class is a member of ***nokia.places.ui***.

Class Summary

The class `Template` extends the `jsMotif` templating engine with a DOM element attribute `module`.

[*For full details, see nokia.places.ui.Template*]

Table 259: Method Summary

Methods
getModules `(name) : {Array}` This method searches for the module named by the caller.
hideSpinner `()` This method hides the spinner element.
render `(jsonObject, targetElem)` This method renders an HTML template, using the data and the target element supplied by the caller.

www.EngineeringBooksPdf.com

Methods
renderObject `(node, jsonObject)`
This method renders a single node in the template.
showSpinner `()`
This method shows the spinner element.

Class Description

The class `Template` extends the `jsMotif` templating engine with a DOM element attribute `module`. The attribute can be used in templates to name the Places API components that can, for example, assist in rendering HTML elements and/or define the behavior of the user interface after the elements have been rendered. In addition, `nokia.places.ui.Template` allows you to specify initialization parameters for each of the Places API UI components referenced by the templates.

Constructor Details

`nokia.places.ui.Template(params)`

This method creates a new instance of the class.

Parameters:

`params`: `{Object}`

An initialization object that can include parameters defined for *jsMotif* as well as the following optional properties:

- `moduleParams` - {Object}, a hash map which specifies the parameters for the modules that render template DOM nodes; for example, this is how you can enable all rating modules specified within the template and set the `perPage` parameter for every `List` object used within the template to 5:

```
moduleParams: {
              'Rating': {
                  enabled: true
              },
              'List': {
                  perPage: 5
              }
          }
```

www.EngineeringBooksPdf.com

Method Details

getModules(name): {Array}

This method searches for the module named by the caller.

Parameters:

name:	{String}
	The name of the module for which to search

Returns:

{Array}	Array of module objects available in current template

hideSpinner()

This method hides the spinner element.

render(jsonObject, targetElem)

This method renders an HTML template, using the data and the target element supplied by the caller.

Parameters:

jsonObject:	{Object}
	An object containing data to be rendered
targetElem:	{HTMLElement} [optional]
	A target element in which to render the data
See:	*jsMotif.Template#render*

renderObject(node, jsonObject)

This method renders a single node in the template. It also checks if a module is associated with the node and, if so, it invokes that modules' callback.

Parameters:

www.EngineeringBooksPdf.com

node:	{HTMLElement}
	An object containing the template node to render
jsonObject:	{Object}
	An object containing data needed to render in the node

showSpinner()

This method shows the spinner element. A new spinner element is created when this method is called for the first time.

Namespace: modules

This namespace is a member of ***nokia.places.ui***.

Namespace Summary

This namespace defines components that enrich the functionality of user interfaces generated with the help of templates.

Namespace Description

This namespace defines components that enrich the functionality of user interfaces generated with the help of templates. This involves support for expandable elements, search, a gallery of images, etc.

Class: Accordion

This class is a member of ***nokia.places.ui.modules***.

Extends: *nokia.places.ui.modules.Module*

Class Summary

This class represents a component that makes it possible to expand and collapse the target template element.

[*For full details, see nokia.places.ui.modules.Accordion*]

www.EngineeringBooksPdf.com

Method Summary

Directly Inherited Methods

Inherited from class *nokia.places.ui.modules.Module* :

hide, *show*

Class Description

This class represents a component that makes it possible to expand and collapse the target template element. When this module has a list of elements as its target, the entire list can be expanded or collapsed.

The template elements targeted by `Accordion` must have the attribute `rel` with the one of the following values (as appropriate):

- `accordion-body` - indicates that the element can be toggled
- `accordion-header` - indicates that the entire list of elements can be toggled

Constructor Details

`nokia.places.ui.modules.Accordion``(params)`

This method creates a new instance of the class.

Parameters:

`params`:	`{Object}`	An initialization object that can include parameters for *nokia.places.ui.modules.Module*

Class: CategorySearch

This class is a member of ***`nokia.places.ui.modules`***.

Extends: *nokia.places.ui.modules.Module*

Class Summary

This class represents a component that provides access to the Places API category-based search.

[*For full details, see nokia.places.ui.modules.CategorySearch*]

www.EngineeringBooksPdf.com

Method Summary

Directly Inherited Methods

Inherited from class *nokia.places.ui.modules.Module* :

hide, *show*

Class Description

This class represents a component that provides access to the Places API category-based search. The user interface allows the Web site user to select a category, and run a search for places that match the chosen category.

The template elements targeted by `CategorySearch` may have the attribute `rel` containing the valid category id, which must be set to one of the following values:

- `eat-drink`
- `going-out`
- `sights-museums`
- `transport`
- `accommodation`
- `shopping`
- `leisure-outdoor`
- `administrative-areas-buildings`
- `natural-geographical`

Constructor Details

`nokia.places.ui.modules.CategorySearch``(params)`

This method creates a new instance of the class.

Parameters:

`params`: `{Object}`

An initialization object that can be specified specified via the *nokia.places.widgets.Place* initialization property `moduleParams`:

- `onResults` - a caller-defined callback function to be invoked after the search results become available; the function is invoked only if `onSelect` is not defined; the function receives the results of a search based

www.EngineeringBooksPdf.com

on the user-selected search term as an array of data structures; these can be wrapped in instances of nokia.places.models.PlaceModel) and you can then use a `Place` instance to retrieve place data, using the ids of the items in the received array

- `onSearchStart` - a caller-defined callback function to be invoked when the search is being fired
- `searchCenter` - a caller-defined function that retrieves an object containing the geographical coordinates of the search center (searches are conducted in widening circles around this location and the results are ordered by relevance to the search criteria); if provided, `useGeoLocation` is ignored; the function is expected to return an object with the following properties:
  - `latitude` - latitude of the center point for the search
  - `longitude` - latitude of the center point for the search
- `maxResults` - {Number}, maximum number of results returned by the categorysearch module, by default it is set to 20
- `useGeoLocation` - {Boolean}, if `true` and the browser supports the W3C Geolocation API and `searchCenter` is not provided, Places search tries to use the W3C Geolocation API to get the client location and use it as the search center; if this parameter is `false` (default) and `searchCenter` is not provided, a global search is executed

Class: Expandable

This class is a member of ***`nokia.places.ui.modules`***.

Extends: *nokia.places.ui.modules.Module*

Class Summary

Expandable is a component which allows user to create an expandable text UI for longer texts in html

[*For full details, see nokia.places.ui.modules.Expandable*]

Method Summary

Directly Inherited Methods

Inherited from class *nokia.places.ui.modules.Module* :

www.EngineeringBooksPdf.com

hide, *show*

Class Description

Expandable is a component which allows user to create an expandable text UI for longer texts in html

Constructor Details

`nokia.places.ui.modules.Expandable()`

Class: Gallery

This class is a member of ***`nokia.places.ui.modules`***.

Extends: *nokia.places.ui.modules.Module*

Class Summary

This class represents a component that displays place-related images.

[*For full details, see nokia.places.ui.modules.Gallery*]

Method Summary

Directly Inherited Methods

Inherited from class *nokia.places.ui.modules.Module* :

hide, *show*

Class Description

This class represents a component that displays place-related images.

The template elements targeted by `Gallery` must have the attribute `rel` with one of the following values (as appropriate):

- `gallery-list` - creates a list with thumbnails
- `gallery-next` - scrolls the gallery list and loads the next thumbnail
- `gallery-prev` - scrolls the gallery list and loads the previous thumbnail
- `gallery-img` - displays a large image after a mouse click on a thumbnail

www.EngineeringBooksPdf.com

Constructor Details

nokia.places.ui.modules.Gallery(params)

This method creates an instance of the class.

Parameters:

params: {Object}

An initialization object that can include parameters for *nokia.places.ui.modules.Module* and may additionally include:

- visible - a numeric value indicating how many images are visible; optional

Class: List

This class is a member of ***nokia.places.ui.modules***.

Extends: *nokia.places.ui.modules.Module*

Class Summary

This class represents a component that displays a list of objects.

[*For full details, see nokia.places.ui.modules.List*]

Table 260: Method Summary

Methods
getPageData (page) : {Array} Function returns data associated with provided page
renderPage (page) Function renders chosen page

Directly Inherited Methods

Inherited from class *nokia.places.ui.modules.Module* :

hide, *show*

www.EngineeringBooksPdf.com

Class Description

This class represents a component that displays a list of objects. The class renders paged data and adds list navigation to the HTML after rendering.

A template element targeted by `List` must have the attribute `rel` with the values "list-data".

Constructor Details

`nokia.places.ui.modules.List``(params)`

This method creates a new instance of the class.

Parameters:

`params:`	`{Object}`

An initialization object that can be specified via the *nokia.places.widgets.Widget* initialization property `moduleParams` and can include parameters for *nokia.places.ui.modules.Module* as well as the following optional properties:

- `onRenderPage` - a user-defined function to be called every time when page is rendered; the function receives as parameters the rendered items as an array and the page number
- `perPage` - a numeric value specifying how many items should be rendered on single page (10 by default)

Method Details

`getPageData``(page): {Array}`

Function returns data associated with provided page

Parameters:

`page:`	`{Number}`

Returns:

`{Array}`	array of elements associated to chosen page

`renderPage``(page)`

www.EngineeringBooksPdf.com

Function renders chosen page

Parameters:

page:	{Number}
	to render

Class: Map

This class is a member of ***nokia.places.ui.modules***.

Extends: *nokia.places.ui.modules.Module*

Class Summary

This class encapsulates functionality to display a place on the map.

[*For full details, see nokia.places.ui.modules.Map*]

Method Summary

Directly Inherited Methods

Inherited from class *nokia.places.ui.modules.Module* :

hide, *show*

Class Description

This class encapsulates functionality to display a place on the map. It detects, if the Maps API is available and renders an interactive map which the user can zoom and pan. If the Maps API is not available `Map` renders a static map.

A template element targeted by `Map` must have the attribute `rel` with the values "map-container".

Constructor Details

`nokia.places.ui.modules.Map``(params)`

This method creates a new instance of the class.

Parameters:

params:	{Object}

www.EngineeringBooksPdf.com

An initialization object that may include parameters defined for *nokia.places.ui.modules.Module*

- `zoom` initial zoom level; it is an integer value from 0 to 20
- `tileType` map display type; it may be one of following strings: 'map', 'satellite', 'terrain', 'transit', 'traffic'

Class: MapBase

This class is a member of ***nokia.places.ui.modules***.

Extends: *nokia.places.ui.modules.Module*

Class Summary

This class is extended by *nokia.places.ui.modules.MapLite* and *nokia.places.ui.modules.MapJSL*.

[*For full details, see nokia.places.ui.modules.MapBase*]

Table 261: Method Summary

Methods
setTileType `(tileType)` Function changes tile type in Map module
setZoom `(zoom)` This method sets the map zoom level.

Directly Inherited Methods

Inherited from class *nokia.places.ui.modules.Module* :

hide, *show*

Class Description

This class is extended by *nokia.places.ui.modules.MapLite* and *nokia.places.ui.modules.MapJSL*. It implements common functionality such as changing the map tile type and zooming.

Method Details

`setTileType``(tileType)`

Function changes tile type in Map module

www.EngineeringBooksPdf.com

Parameters:

`tileType:` `{String}`

of following: 'map', 'satellite', 'terrain', 'transit', 'traffic'

`setZoom``(zoom)`

This method sets the map zoom level.

Parameters:

`zoom:` `{Number}`

The new map zoom level given as a value between 0 and 20

Class: MapJSL

This class is a member of ***`nokia.places.ui.modules`***.

Extends: *nokia.places.ui.modules.MapBase*

Class Summary

This class encapsulates functionality to display a place on the map.

[*For full details, see nokia.places.ui.modules.MapJSL*]

Method Summary

Directly Inherited Methods

Inherited from class *nokia.places.ui.modules.MapBase* :

setTileType, *setZoom*

Inherited from class *nokia.places.ui.modules.Module* :

hide, *show*

Class Description

This class encapsulates functionality to display a place on the map. It requires Maps API to be loaded.

A template element targeted by `Map` must have the attribute `rel` with the values "map-container".

www.EngineeringBooksPdf.com

Constructor Details

`nokia.places.ui.modules.MapJSL``(params)`

This method creates a new instance of the class.

Parameters:

`params`: `{Object}`

An initialization object that may include parameters defined for *nokia.places.ui.modules.Module*

- `zoom` map initial zoom level; it is an integer value from 0 to 20
- `tileType` map display type; it may be one of following strings: 'map', 'satellite', 'terrain', 'transit', 'traffic'

Class: MapLite

This class is a member of ***`nokia.places.ui.modules`***.

Extends: *nokia.places.ui.modules.MapBase*

Class Summary

This class encapsulates functionality to display a place on the map.

[*For full details, see nokia.places.ui.modules.MapLite*]

Table 262: Method Summary

Methods
`setPinPosition` `(iconAnchor, parentElem)` This method sets the pin location according to the component size and image anchor.

Directly Inherited Methods

Inherited from class *nokia.places.ui.modules.MapBase* :

setTileType, *setZoom*

Inherited from class *nokia.places.ui.modules.Module* :

hide, *show*

www.EngineeringBooksPdf.com

Class Description

This class encapsulates functionality to display a place on the map. This module renders the static map only.

A template element targeted by `Map` must have the attribute `rel` with the values "map-container".

Constructor Details

`nokia.places.ui.modules.MapLite(params)`

This method creates a new instance of the class.

Parameters:

`params`: `{Object}`

An initialization object that may include parameters defined for *nokia.places.ui.modules.Module*

- `zoom` map initial zoom level; it is an integer value from 0 to 20
- `tileType` map display type; it may be one of following strings: 'map', 'satellite', 'terrain', 'transit', 'traffic'

Method Details

`setPinPosition(iconAnchor, parentElem)`

This method sets the pin location according to the component size and image anchor.

Parameters:

`iconAnchor`: `{Object}`

An object containing the custom icon's anchor coordinates as a number of pixels from the center of the icon; the object must have the following structure `{x: <pixelsX>, y: <pixelsY>}`; positive values mean that the anchor point is set left and down from the center of the icon image, negative values indicate that the anchor point is above and/or to the right of the center; if `null`, the anchor coordinates from settings are used

`parentElem`: `{Object}`

The container DOM element for the map

www.EngineeringBooksPdf.com

Class: MobileGallery

This class is a member of ***nokia.places.ui.modules***.

Extends: *nokia.places.ui.modules.Module*

Class Summary

This class represents a component that displays place-related images for mobile templates.

[*For full details, see nokia.places.ui.modules.MobileGallery*]

Method Summary

Directly Inherited Methods

Inherited from class *nokia.places.ui.modules.Module* :

hide, *show*

Class Description

This class represents a component that displays place-related images for mobile templates.

The template elements targeted by `MobileGallery` must have the attribute `rel` with one of the following values (as appropriate):

- `gallery-list` - creates a list with thumbnails
- `gallery-img` - displays a large image after a mouse click on a thumbnail

Constructor Details

`nokia.places.ui.modules.MobileGallery``(params)`

This method creates an instance of the class.

Parameters:

`params`:	`{Object}`	An initialization object that can include parameters for *nokia.places.ui.modules.Module*

Class: Module

This class is a member of ***nokia.places.ui.modules***.

www.EngineeringBooksPdf.com

Class Summary

`Module` is the base class for components that implement the behavior (and actions) for template-defined UI.

[*For full details, see nokia.places.ui.modules.Module*]

Table 263: Method Summary

Methods
hide `()` Hiding Module element
show `()` Showing Module element

Class Description

`Module` is the base class for components that implement the behavior (and actions) for template-defined UI. This method creates new instace of the class `Module`.

Note that any initialization arguments that you require for this class and classes that extend it must be included as part of the initialization object passed to the appropriate widget constructor - see also `moduleParams` under *nokia.places.widgets.Widget*.

Constructor Details

`nokia.places.ui.modules.Module(params)`

This method creates a new instance of the class.

Parameters:

`params:` `{Object}`

An initialization object with the following properties:

- `relMap` - a map object relating the `rel` attributes and the DOM elements to which they apply
- `data` - data to be rendered (displayed) using a template
- `node` - the parent DOM node for the given module
- `template` - the template object which renders the given module

www.EngineeringBooksPdf.com

Method Details

hide()

Hiding Module element

show()

Showing Module element

Class: Rating

This class is a member of ***nokia.places.ui.modules***.

Extends: *nokia.places.ui.modules.Module*

Class Summary

This class represents a component that displays place rating.

[*For full details, see nokia.places.ui.modules.Rating*]

Table 264: Method Summary

Methods
disable ()
Function disables user click and rate action
enable ()
Function enables rating for user click and rate action

Directly Inherited Methods

Inherited from class *nokia.places.ui.modules.Module* :

hide, *show*

Class Description

This class represents a component that displays place rating.

The template elements targeted by `Rating` must have the attribute `rel` with one of the following values (as appropriate):

- `rating-list` - displays a list of clickable stars that can be toggled to set rating

www.EngineeringBooksPdf.com

- `rating-star1` - displays the first clickable star
- `rating-star2` - displays the second clickable star
- `rating-star3` - displays the third clickable star
- `rating-star4` - displays the fourth clickable star
- `rating-star5` - displays the fifth clickable star
- `rating-text` - displays a tool tip shown when the mouse hovers over the stars
- `rating-value` - displays a rating value
- `rating-count` - displays a rating count

Constructor Details

`nokia.places.ui.modules.Rating(params)`

This method creates a new instance of the class.

Parameters:

`params`: `{Object}`

An initialization object that can include parameters for *nokia.places.ui.modules.Module*, as well as the following optional properties:

- `enabled` {Boolean} when `true` user rating (by mouse-clicking) is enabled
- `onRated` user defined function which is called after rating action is performed
- `uiOnly` {Boolean} when `true` only rating star element should be displayed (no count or text elements)

Method Details

`disable()`

Function disables user click and rate action

`enable()`

Function enables rating for user click and rate action

www.EngineeringBooksPdf.com

Class: Recommendations

This class is a member of **nokia.places.ui.modules**.

Extends: *nokia.places.ui.modules.Module*

Class Summary

This class represents a component that fetches and displays recommendations.

[*For full details, see nokia.places.ui.modules.Recommendations*]

Method Summary

Directly Inherited Methods

Inherited from class *nokia.places.ui.modules.Module* :

hide, *show*

Class Description

This class represents a component that fetches and displays recommendations.

Constructor Details

nokia.places.ui.modules.Recommendations(params)

This method creates a new instance of the class.

Parameters:

params:	{Object} An initialization object that can be specified via the *nokia.places.widgets.Place* initialization property modulePlaces and can include parameters for *nokia.places.ui.modules.Module*, as well as the following optional properties: • maxReviews - a Number which indicates the maximum number of simultaneously displayed recommendations

Class: Reviews

This class is a member of **nokia.places.ui.modules**.

www.EngineeringBooksPdf.com

Extends: *nokia.places.ui.modules.Module*

Class Summary

This class represents a component that fetches and displays reviews for a place.

[*For full details, see nokia.places.ui.modules.Reviews*]

Method Summary

Directly Inherited Methods

Inherited from class *nokia.places.ui.modules.Module* :

hide, *show*

Class Description

This class represents a component that fetches and displays reviews for a place.

Constructor Details

`nokia.places.ui.modules.Reviews``(params)`

This method creaetes a new instance of the class.

Parameters:

`params`: `{Object}`

An initialization object that can be specified via the *nokia.places.widgets.Place* initialization property `moduleParams` and can include parameters for *nokia.places.ui.modules.Module*, as well as the following optional properties:

- `start` - param which tells reviews from which review it should start to render
- `limit` - a `Number` which indicates maximum number of simultaneously displayed reviews

Class: SearchBox

This class is a member of ***`nokia.places.ui.modules`***.

www.EngineeringBooksPdf.com

Class Summary

This class represents the Nokia Maps API `SearchBox`.

[*For full details, see nokia.places.ui.modules.SearchBox*]

Class Description

This class represents a component that provides an interface for a Web site user to search for places (locations) and view the results. It offers suggestions when the user begins to type a search term, handles the search itself and displays the results in a designated element on a Web page.

The template elements targeted by `SearchBox` must have the attribute `rel` with one the following values (as appropriate):

- `searchbox-list` - displays a list of search suggestions
- `searchbox-input` - displays the edit box where the user types in search terms
- `searchbox-button` - displays the button that triggers a place search

Constructor Details

`nokia.places.ui.modules.SearchBox``(params)`

This method creates a new instance of the class.

Parameters:

`params`: `{Object}`

An initialization object that can include parameters for *nokia.places.ui.modules.Module*, as well as the following optional properties:

- `searchCenter` - a caller-defined function that retrieves the an object containing the coordinates of the search center; the function is expected to return an object with the following properties:
  - `latitude` - latitude of the center point for the search
  - `longitude` - latitude of the center point for the search
- `useGeoLocation` - {Boolean} if set to `true`, search will try to get client location to set as a search center
- `onResults` - a caller-defined callback function to be invoked after the search results become available; the function is invoked only if `onSelect` is not defined; the function receives the results of a

www.EngineeringBooksPdf.com

search based on the user-selected search term as an object of type *nokia.places.objects.SearchResponseView*

- `onSearchStart` - a caller-defined callback function to be invoked when the search is being fired
- `maxResults` - {Number}, maximum number of results returned by the searchbox module, by default it is set to 20
- `suggestions` - an optional object whose properties (also optional) define the composition of the search term suggestions list displayed to the user and functions that handle suggestions
  - `limits` - an optional object containing properties that define the composition of the list of suggestions displayed to the user
    - `maxSuggestions` - (optional) the maximum number of suggestions to show in the suggestions list when the user starts typing a new search term; the default value is 3
    - `maxSearched` - (optional) maximum number of suggestions based on previous searches to show in the suggestions list, the default value is 3
    - `maxFavorites` - (optional) maximum number of suggestions based on favorites to show in the suggestions list, the default value is 3
    - `maxSaved` - (optional) maximum number of suggestions from local storage (previously entered search terms) to be included in the suggestion list displayed when the user starts typing a new search term, the default value is 3
  - `handlers`
    - `onSuggestions` - an optional caller-defined callback function to be invoked when when suggestions are returned by the server; the function must accept an array of objects containing the suggestions
    - `onSearchSuggestions` - an optional caller-defined calback function to be invoked when search suggestions are returned by the server; the function must accept an array of objects search suggestions

www.EngineeringBooksPdf.com

- onSelect - an optional caller-defined function to be invoked when the Web user selects a suggestion; the function must be able to accept two arguments: a search term (String), and an object of type *nokia.places.objects.SearchResult* representing the selected item; note that if provided, the onSelect function prevents execution of onResults and thus overrides the default behavior of SearchBox

- favourites - an optional function that can be defined by the caller; if provided, it returns a list of favorites
- keyInterval - an optional {Number} value that indicates how much time to allow the user to enter suggestions (in milliseconds) before firing a request (this allows you to avoid firing a request for each letter the user types)
- showAddress - a Boolean value that indicates whether to show the street address in the list of suggestions when maxSearched is greater than zero

Class: ShareMenu

This class is a member of ***nokia.places.ui.modules***.

Extends: *nokia.places.ui.modules.Module*

Class Summary

This class represents a component that handles links labeled "Show on map" and "Share" when the user clicks on them in the user interface generated from the sharemenu template.

[*For full details, see nokia.places.ui.modules.ShareMenu*]

Method Summary

Directly Inherited Methods

Inherited from class *nokia.places.ui.modules.Module* :

hide, *show*

www.EngineeringBooksPdf.com

Class Description

This class represents a component that handles links labeled "Show on map" and "Share" when the user clicks on them in the user interface generated from the `sharemenu` template.

The template elements targeted by `ShareMenu` must have the attribute `rel` with one of the following values (as appropriate):

- `sharemenu-link` - displays a link labeled "Show on map"
- `sharemenu-share` - displays a link labeled "Share"
- `sharemenu-share-container` - container displaying the place URL after the user has clicked on the link labeled "Share"
- `sharemenu-input` - displays an input box containing the place URL
- `sharemenu-cancel` - displays a link labeled "Cancel"; by clicking on it, the user restores the original share menu

Constructor Details

`nokia.places.ui.modules.ShareMenu``(params)`

This method creates a new instance of the class.

Parameters:

`params:`	`{Object}`	An initialization object that can include parameters defined for *nokia.places.ui.modules.Module*

Namespace: templateFunctions

This namespace is a member of ***`nokia.places.ui`***.

Namespace Summary

This namespace defines functions that populate HTML elements in a template with data when the template is rendered.

Table 265: Method Summary

Methods
`addressLine` `(jsonObject) : {String}`
This function retrieves the complete formatted address and display it without line breaks (within single line)

www.EngineeringBooksPdf.com

Methods
formattedAddress `(jsonObject) : {String}` This function retrieves the complete formatted address of a place from the JSON object supplied by the caller.
isPlace `(jsonObject) : {Boolean}` This function checks if an object supplied by the caller is a place.
primaryDescriptions `(jsonObject) : {Object}` This function returns an array of up to two descriptions with the most content available from the JSON object supplied by the caller.
primaryEmail `(jsonObject) : {String}` This function retreives the primary email number for a place from the JSON object supplied by the caller.
primaryFax `(jsonObject) : {String}` This function retrieves the primary fax number of a place, if available, from the JSON object supplied by the caller.
primaryMobile `(jsonObject) : {String}` This function returns the primary mobile phone number for a place from the JSON object supplied by the caller.
primaryPhone `(jsonObject) : {String}` This function retrieves the primary phone number for a place, if available in the JSON object supplied by the caller.
primaryURL `(jsonObject) : {String}` This function retrieves the primary Web site URL for a place, if available in the JSON object supplied by the caller.
primaryURLLabel `(jsonObject)` This function retrieves the primary Web site label associated with a place from the JSON object supplied by the caller.
reviewDate `(jsonObject)` This function retrieves a date formatted appropriately for the locale from the JSON object supplied by the caller.
reviewMetaData `(jsonObject) : {String}` This function returns string containing review author name and creation date
sendSMS `(jsonObject) : {String}` This function concats url and placeId with mobile sms link syntax to provide share by sms function

Namespace Description

This namespace defines functions that populate HTML elements in a template with data when the template is rendered. The functions must be invoked from the value of the element attribute `fill`, for example: `fill="{primaryDescriptions()}"`.

www.EngineeringBooksPdf.com

Method Details

addressLine(jsonObject): {String}

This function retrieves the complete formatted address and display it without line breaks (within single line)

Parameters:

jsonObject:	{*nokia.places.objects.Place*}

Returns:

{String}	formatted address line

formattedAddress(jsonObject): {String}

This function retrieves the complete formatted address of a place from the JSON object supplied by the caller. The format follows the pattern: full street name + zip/post code + city + country.

Parameters:

jsonObject:	{*nokia.places.objects.Place*}
	A place object

Returns:

{String}	A string containing the full address

isPlace(jsonObject): {Boolean}

This function checks if an object supplied by the caller is a place.

Parameters:

jsonObject:	{*nokia.places.objects.Place*}
	A place object to check

Returns:

{Boolean}	`true` if the supplied object is a valid instance of {nokia.places.objects.Place}, otherwise `false`

www.EngineeringBooksPdf.com

primaryDescriptions(jsonObject): {Object}

This function returns an array of up to two descriptions with the most content available from the JSON object supplied by the caller.

Parameters:

jsonObject:	{*nokia.places.objects.Place*} A place object

Returns:

{Object}	An array of retrieved description items (nokia.places.objects.Place.media.editorials)

primaryEmail(jsonObject): {String}

This function retreives the primary email number for a place from the JSON object supplied by the caller.

Parameters:

jsonObject:	{*nokia.places.objects.Place*} A place object

Returns:

{String}	A string containing the primary e-mail address

primaryFax(jsonObject): {String}

This function retrieves the primary fax number of a place, if available, from the JSON object supplied by the caller.

Parameters:

jsonObject:	{*nokia.places.objects.Place*} A place object

www.EngineeringBooksPdf.com

Returns:

{String}	A string containing the primary fax number

primaryMobile(jsonObject): {String}

This function returns the primary mobile phone number for a place from the JSON object supplied by the caller.

Parameters:

jsonObject:	{*nokia.places.objects.Place*}
	A place object

Returns:

{String}	A string containing the primary mobile phone number

primaryPhone(jsonObject): {String}

This function retrieves the primary phone number for a place, if available in the JSON object supplied by the caller.

Parameters:

jsonObject:	{*nokia.places.objects.Place*}
	A place object

Returns:

{String}	A string contianing the primary phone number

primaryURL(jsonObject): {String}

This function retrieves the primary Web site URL for a place, if available in the JSON object supplied by the caller.

Parameters:

jsonObject:	{*nokia.places.objects.Place*}

www.EngineeringBooksPdf.com

A place object

Returns:

`{String}` A string containing the primary URL

`primaryURLLabel(jsonObject)`

This function retrieves the primary Web site label associated with a place from the JSON object supplied by the caller.

Parameters:

`jsonObject:` `{nokia.places.objects.Place}`

A place object

Returns:

A {String} containing the primary Web site URL, or, if the URL is longer than 25 characters, the 'Website' string

`reviewDate(jsonObject)`

This function retrieves a date formatted appropriately for the locale from the JSON object supplied by the caller.

Parameters:

`jsonObject:` `{nokia.places.objects.Review}`

A review object

Returns:

A {String} containing a formatted date

`reviewMetaData(jsonObject): {String}`

This function returns string containing review author name and creation date

www.EngineeringBooksPdf.com

Parameters:

`jsonObject:` `{nokia.places.objects.Review}`

Returns:

`{String}`

sendSMS`(jsonObject): {String}`

This function concats url and placeId with mobile sms link syntax to provide share by sms function

Parameters:

`jsonObject:` `{`*`nokia.places.objects.Place`*`}`

A place object

Returns:

`{String}` A string contianing mobile sms link

Namespace: widgets

This namespace is a member of ***`nokia.places`***.

Namespace Summary

This namespace defines widget classes that can be used when building user interfaces.

Namespace Description

This namespace defines widget classes that can be used when building user interfaces. The widgets provide functionality and UI elements to support search as well as displaying actual place data.

Class: CategorySearch

This class is a member of ***`nokia.places.widgets`***.

Extends: *nokia.places.widgets.Widget*

www.EngineeringBooksPdf.com

Class Summary

This class represents a UI widget that provides access to the Places API category-based search.

[*For full details, see nokia.places.widgets.CategorySearch*]

Method Summary

Directly Inherited Methods

Inherited from class *nokia.places.widgets.Widget* :

getData, *hide*, *setData*, *setTemplate*, *show*

Class Description

This class represents a UI widget that provides access to the Places API category-based search. The user interface allows the Web site user to select a category, and run a search for places that match the chosen category.

Constructor Details

`nokia.places.widgets.CategorySearch``(params)`

This method creates an instance of the widget `CategorySearch`.

Parameters:

`params`: `{Object}`

An initialization object that can include parameters for *nokia.places.widgets.Widget*, as well as the following optional properties:

- `onResults` - a caller-defined callback function to be invoked after the search results become available; the function receives the results of a search based on the user-selected search term as an object of type *nokia.places.objects.SearchResponseView*
- `onSearchStart` - a caller-defined callback function to be invoked when the search is being fired
- `maxResults` - `Number`, maximum number of results returned by the categorysearch, by default it is set to 20
- `searchCenter` - a caller-defined function that retrieves an object containing the geographical coordinates of the search center (searches are

www.EngineeringBooksPdf.com

conducted in widening circles around this location and the results are ordered by relevance to the search criteria); if provided, `useGeoLocation` is ignored; the function is expected to return an object with the following properties:

  - `latitude` - latitude of the center point for the search
  - `longitude` - latitude of the center point for the search

- `useGeoLocation` - `Boolean`, if `true` and the browser supports the W3C Geolocation API and `searchCenter` is not provided, Places search tries to use the W3C Geolocation API to get the client location and use it as the search center; if this parameter is `false` (default) and `searchCenter` is not provided, a global search is executed

Class: Place

This class is a member of ***`nokia.places.widgets`***.

Extends: *nokia.places.widgets.Widget*

Class Summary

This class defines a UI widget that displays data for one place.

[*For full details, see nokia.places.widgets.Place*]

Table 266: Method Summary

Methods
`displayOnMap` `(place, map)` This method displays a place information in an info bubble on the map.
`setPlace` `(place)` This method sets the placeId or place reference to trigger data retrieval for the place and subsequent rendering of the data on the page.

Directly Inherited Methods

Inherited from class *nokia.places.widgets.Widget* :

getData, *hide*, *setData*, *setTemplate*, *show*

www.EngineeringBooksPdf.com

Class Description

This class defines a UI widget that displays data for one place.

Constructor Details

`nokia.places.widgets.Place(params)`

This method creates an instance of the widget `Place`.

Parameters:

`params`: `{Object}`

An initialization object that can include parameters for *nokia.places.widgets.Widget* as well as the following optional properties:

- `placeId` - the id of a place which should be initially loaded
- `onData` - a user-defined function which is called after the data has been successfully loaded
- `onNoData` - a user-defined function which is called when data has failed to load, for example, it does not exist for the provided placeId
- `map` - an optional reference to a `nokia.maps.map.Display` object; when specified and the placeId is set/changed (via a call to *`nokia.places.widgets.Place#setPlace`*( )), the info bubble is displayed on the map at the location corresponding to the `placeId` or `href` (for example, you can implement a click event handler on an instance of `nokia.places.widgets.ResultList` to call *`nokia.places.widgets.Place#setPlace`*( ) with the `href` of the place on which the Web user has clicked: this causes the info bubble to be displayed on the map, provided that `map` refers to a `nokia.maps.map.Display` object)

Method Details

`displayOnMap(place, map)`

This method displays a place information in an info bubble on the map.

Parameters:

`place`: `{Object}`

www.EngineeringBooksPdf.com

A placeId as a string or a JSON object representing the place to display on the map

`map`: `{Object}` [optional]

A reference to an instance of `nokia.maps.map.Display` representing the map on which the place is to be displayed; if not specified, the implementation attempts to use the class property `map`

`setPlace(place)`

This method sets the placeId or place reference to trigger data retrieval for the place and subsequent rendering of the data on the page.

Parameters:

`place`: `{Object}`

an object identifying the place for which to retrieve data and render them on the page; the object contains either the property `placeId` or `href` (with the value from *nokia.places.objects.SearchResult*)

Class: ResultList

This class is a member of ***`nokia.places.widgets`***.

Extends: *nokia.places.widgets.Widget*

Class Summary

This class defines a UI widget capable of displaying data for multiple places.

[*For full details, see nokia.places.widgets.ResultList*]

Table 267: Method Summary

Methods
`displayOnMap` `(map, onIconClick)` This method renders current page results as icons on the Map.
`getCurrentPage` `()` This method retrieves the current page number from the `ResultList` widget.

www.EngineeringBooksPdf.com

Methods
getCurrentPageData `()` This method retrieves the data rendered on current page.
renderPage `(page)` This method renders a chosen page (from the result set).
setData `(data, (optional))` This method associates data with the given widget instance and renders the data using a template.

Directly Inherited Methods

Inherited from class *nokia.places.widgets.Widget* :

getData, *hide*, *setData*, *setTemplate*, *show*

Class Description

This class defines a UI widget capable of displaying data for multiple places. A typical use case for this class is to display an interactive list of search results (see also nokia.places.SearchBox). If the data are rendered on more than one page, the class provides a means of navigating the pages. The class uses the template `nokia.general.resultlist` to render the places data.

Constructor Details

`nokia.places.widgets.ResultList(params)`

This method creates an instance of the widget `ResultList`.

Parameters:

`params`: `{Object}`

An initialization object that can include parameters defined for *nokia.places.widgets.Widget* as well as the following optional properties:

- `onRenderPage` - a callback function to be invoked when additional processing is required after a page has been rendered
- `perPage` - a {Number} indicating how many list elements are to be shown per page (default is 10)
- `data` - (optional) an array of place data which are to be rendered; the data typically contain the places search results (see also `nokia.places.SearchBox`; if you wish to instantiate

www.EngineeringBooksPdf.com

`nokia.places.widgets.ResultList` without initially displaying any place data, omit this parameter - you can later call the method `nokia.places.widgets.ResultList.setData()` to provide data for rendering

- `map` - an optional reference to an `nokia.maps.map.Display` object; when specified, items in the list can be displayed on the map display instance to which it refers (it is then not necessary to pass the argument `map` to `nokia.places.widgets.ResultList.displayOnMap()`)

Method Details

`displayOnMap(map, onIconClick)`

This method renders current page results as icons on the Map.

Parameters:

`map`:	`{Object}` [optional] A reference to a map (`nokia.maps.map.Display`) object; if not specified, the implementation attempts to use the class property `map`
`onIconClick`:	`{Function}` A caller-defined handler for the icon click event

`getCurrentPage()`

This method retrieves the current page number from the `ResultList` widget.

Returns:

A value representing the page number

`getCurrentPageData()`

This method retrieves the data rendered on current page.

Returns:

www.EngineeringBooksPdf.com

A JSON object containing all the data rendered on the current page (see also *nokia.places.objects.Place*)

renderPage(page)

This method renders a chosen page (from the result set).

Parameters:

page: {Object}

An object representing the page to render

setData(data, (optional))

This method associates data with the given widget instance and renders the data using a template.

Parameters:

data: {Object}

The data to associate with the widget and to render; the data is an array of instances of *nokia.places.objects.Place* or an instance of *nokia.places.objects.SearchResponseView*

(optional): {Object}

the target element in which to render the data

Class: SearchBox

This class is a member of ***nokia.places.widgets***.

Extends: *nokia.places.widgets.Widget*

Class Summary

This class represents a UI widget that provides access to the Places API search functionality.

[*For full details, see nokia.places.widgets.SearchBox*]

www.EngineeringBooksPdf.com

Table 268: Method Summary

Methods
abortRequest `()` This method aborts the current suggestion and search request.
hideSuggestions `()` This method hides a suggestion list.
navigateList `(direction)` This method navigates suggestion list using parameter (positive 'up', negative 'down').
registerResultList `(resultList)` This method binds ResultList widget *nokia.places.widgets.ResultList* to `SearchBox` widget.
search `()` This method runs a search, using the current value in the widget's input field.
select `(term)` This method sets the provided term into the input field.
setCurrentLocation `(location)` This method sets the current geographical position in terms of latitude and longitude.
showSuggestions `()` This method shows a suggestion list.
suggest `()` This method runs a suggestion search, using current value in the input field, and causes the results to be displayed as a list of suggestions.

Directly Inherited Methods

Inherited from class *nokia.places.widgets.Widget* :

getData, *hide*, *setData*, *setTemplate*, *show*

Class Description

This class represents a UI widget that provides access to the Places API search functionality. The class allows a Web site user to search for places (locations) and view the results. It offers suggestions when the user begins to type a search term, handles the search itself and displays the results in a designated element on a Web page.

www.EngineeringBooksPdf.com

Constructor Details

`nokia.places.widgets.SearchBox``(params)`

This method creates an instance of the widget `SearchBox`.

Parameters:

`params`: `{Object}`

An initialization object that can include parameters for *nokia.places.widgets.Widget*, as well as the following optional properties:

- `searchCenter` - a caller-defined function that retrieves an object containing the geographical coordinates of the search center (searches are conducted in widening circles around this location and the results are ordered by relevance to the search criteria); if provided, `useGeoLocation` is ignored; the function is expected to return an object with the following properties:
  - `latitude` - latitude of the center point for the search
  - `longitude` - latitude of the center point for the search
- `maxResults` - {Number}, maximum number of results returned by the searchbox, by default it is set to 20
- `useGeoLocation` - {Boolean}, if `true` and the browser supports the W3C Geolocation API and `searchCenter` is not provided, Places search tries to use the W3C Geolocation API to get the client location and use it as the search center; if this parameter is `false` and `searchCenter` is not provided, a global search is executed
- `map` - an optional reference to a Nokia Maps API map object; when specified instead of `searchCenter`, `SearchBox` reads the location of the search center from the map, updating it as the user pans or move the map
- `onResults` - a caller-defined callback function to be invoked after the search results become available; the function is invoked only if `onSelect` is not defined; the function receives the results of a search based on the user-selected search term as an object of type *nokia.places.objects.SearchResponseView*
- `onSearchStart` - a caller-defined callback function to be invoked when the search is being fired

www.EngineeringBooksPdf.com

- `resultList` - a reference to an existing *nokia.places.widgets.ResultList*. If provided, SearchBox widget will use that ResultList widget to render results
- `suggestions` - an optional object whose properties (also optional) define the composition of the search term suggestions list displayed to the user and functions that handle suggestions
  - `limits` - an optional object containing properties that define the composition of the list of suggestions displayed to the user
    - `maxSuggestions` - (optional) the maximum number of suggestions to show in the suggestions list when the user starts typing a new search term; the default value is 4
    - `maxSearched` - (optional) maximum number of suggestions based on previous searches to show in the suggestions list, the default value is 2
    - `maxFavorites` - (optional) maximum number of suggestions based on favorites to show in the suggestions list, the default value is 1
    - `maxSaved` - (optional) maximum number of suggestions from local storage (previously entered search terms) to be included in the suggestion list displayed when the user starts typing a new search term, the default value is 3
  - `handlers`
    - `onSuggestions` - an optional caller-defined callback function to be invoked when when suggestions are returned by the server; the function must accept an array of objects containing the suggestions
    - `onSearchSuggestions` - an optional caller-defined calback function to be invoked when search suggestions are returned by the server; the function must accept an array of objects search suggestions
    - `onSelect` - an optional caller-defined function to be invoked when the Web user selects a suggestion; the function must be able to accept two arguments: a search term ({String}), and an object ({Object}) representing the search results; the

www.EngineeringBooksPdf.com

search results object is populated with real search results data if `maxSearched` is non-zero, thus allowing the search data to appear in the displayed suggestions list; note that if provided, the `onSelect` function prevents execution of `onResults` and thus overrides the default behavior of SearchBox

- `favourites` - an optional function that can be defined by the caller; if provided, it returns a list of favorites
- `keyInterval` - an optional {Number} value that indicates how much time to allow the user to enter suggestions (in milliseconds) before firing a request (this allows you to avoid firing a request for each letter the user types)
- `showAddress` - a Boolean value that indicates whether to show the street address in the list of suggestions when `maxSearched` is greater than zero

Method Details

`abortRequest()`

This method aborts the current suggestion and search request. A suggestion request is typically fired after the third character has been entered into the search box and the results (suggestions) are displayed in a drop-down box, but if this method is used no suggestion search is run and no suggestions are displayed. Similarly, if the method is called after the user has hit return after entering a search term, the search is cancelled and no results are displayed.

`hideSuggestions()`

This method hides a suggestion list.

`navigateList(direction)`

This method navigates suggestion list using parameter (positive 'up', negative 'down').

Parameters:

`direction:` `{Number}`

www.EngineeringBooksPdf.com

registerResultList(resultList)

This method binds ResultList widget *nokia.places.widgets.ResultList* to SearchBox widget. So searchbox widget can render results using place list.

Parameters:

resultList:	{Object}

search()

This method runs a search, using the current value in the widget's input field.

select(term)

This method sets the provided term into the input field.

Parameters:

term:	{String}
	The search term to place in the input field

setCurrentLocation(location)

This method sets the current geographical position in terms of latitude and longitude.

Parameters:

location:	{Object}
	A geo position object, containing the latitude and longitude for example {latitude: 111, longitude: 222}

showSuggestions()

This method shows a suggestion list.

suggest()

www.EngineeringBooksPdf.com

This method runs a suggestion search, using current value in the input field, and causes the results to be displayed as a list of suggestions.

Class: Widget

This class is a member of ***nokia.places.widgets***.

Class Summary

The Widget class defines a UI component that renders place data, using a template and a JSON data object.

[*For full details, see nokia.places.widgets.Widget*]

Table 269: Method Summary

Methods
getData `()` This method retrieves the rendered data object.
hide `()` This method hides the rendered widget.
setData `(data, (optional))` This method associates data with the given widget and renders the data using a template.
setTemplate `(template, locale, onTemplate, reRender)` This method changes the template for the given widget.
show `()` This method shows the rendered widget.

Class Description

The Widget class defines a UI component that renders place data, using a template and a JSON data object. It is the base class extended by the classes *nokia.places.widgets.Place*, *nokia.places.widgets.ResultList* and *nokia.places.widgets.SearchBox*.

Constructor Details

nokia.places.widgets.Widget`(params)`

This method creates an instance of `Widget`.

www.EngineeringBooksPdf.com

Parameters:

`params:` `{Object}`

An initialization object with the following properties:

- `template` - a (mandatory) parameter that represents a template to be used to render place data for display; its value may take one of the following forms:
  - a {String} containing HTML elements that define the template pattern, for example ' <a></xref> '
  - a {String} containing the id of an existing DOM element - the template pattern is extracted from the DOM node
  - an {Object} reference to an existing DOM node in JavaScript
- `targetNode` - the element in which the template is to be rendered; its value may be one of:
  - a {String} containing the id of an existing element
  - an {Object} reference to an existing DOM element in JavaScript
- `locale` - optional; a language designation composed of An ISO 369 language code and an ISO 36166-1 Alpha-2 country code (for example 'cs-cz' stands for Czech as spoken in the Czech Republic; if not specified, the browser language is used
- `moduleParams` {Object} - a hash map which specifies the parameters for the modules that render template DOM nodes; for example, this is how you can enable all rating modules specified within the template and set the `perPage` parameter for every `List` object used within the template to 5:

```
moduleParams: {
              'Rating': {
                  enabled: true
              },
              'List': {
                  perPage: 5
              }
          }
```

- `predefined` - an object/hashmap containing a user-defined function that may be used to render an element in a template

www.EngineeringBooksPdf.com

- `events` - an array of objects which specify the events attached to template nodes; each object in the array corresponds to one event and evnet handler and has the following parameters:
  - `rel` - a {String} that specifies the template node to which to attach the event
  - `name` - a {String} containing the event name; the supported event names are 'keydown', 'keyup', 'keypress', 'click', 'dblclick', 'mousedown', 'mousemove', 'mouseout', 'mouseover', 'mouseup', 'mouseenter', 'mouseleave', 'blur', 'change', 'focus', 'reset', 'select', 'submit', 'abort'
  - `handler` - {Function}, a user-defined function to be called when the named event has been triggered; the function receives a data object as an argument (a place response object); within the body of the function, `this` refers to the template node on which the event was triggered
- `onReady` - a caller-defined function invoked when the widget is fully initialized and has finished loading templates (from the back-end server or a custom location) and translations (from the back-end); when the function is called, you can invoke widget methods, for example to set data, as follows: `this.setData()` (`this` within the scope of the function refers to the widget itself)
- `onRender` - a caller-defined function invoked when the widget is fully rendered

Method Details

`getData()`

This method retrieves the rendered data object.

Returns:

A JSON object containing the rendered data.

`hide()`

This method hides the rendered widget.

www.EngineeringBooksPdf.com

`setData(data, (optional))`

This method associates data with the given widget and renders the data using a template.

Parameters:

`data`:	`{Object}`
	The data to associate with the widget and to render
`(optional)`:	`{HTMLElement}`
	the target element in which to render the data

`setTemplate(template, locale, onTemplate, reRender)`

This method changes the template for the given widget.

Parameters:

`template`:	`{Object}`
	A template object, which may be an HTML string, an existing DOM element id, or a reference to a DOM node (see also class initialization parameters)
`locale`:	`{String}` [optional]
	A language designation composed of An ISO 369 lanuage code and an ISO 36166-1 Alpha-2 country code (for example 'cs-cz' stands for Czech as spoken in the Czech Republic; if not specified the browser language is used
`onTemplate`:	`{function}` [optional]
	A caller-defined function to be executed when a template is applied
`reRender`:	`{Boolean}`
	A Boolean, if `true`, the widget is re-rendered with the last used (existing) JSON data object

`show()`

www.EngineeringBooksPdf.com

This method shows the rendered widget.

www.EngineeringBooksPdf.com