Oracle Field Service Cloud Integrating with GPS API

19A

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Integrating with GPS API

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Preface

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1 **Introduction**

Document Purpose

This document is a developer's guide for the GPS API. The GPS API is available as part of the Oracle Field Service Cloud platform.

It contains information to enable the integration of an external GPS system with Oracle Field Service Cloud.

Scope of the Document

The document describes the elements of SOAP technology and its usage when creating client applications for interacting with the GPS module of OFSC system.

Target Audience

This document is intended for software developers, implementing SOAP clients for interaction with the OFSC GPS module.

Accessing the APIs

To access the Oracle Field Service Cloud APIs, you must use the https://api.etadirect.com URL scheme. All old URL schemes such as, companyname.etadirect.com, na.etadirect.com, eu.etadirect.com, and so on are deprecated for Oracle Field Service Cloud versions 15.8 and later.

For example, if you are using https://companyname.etadirect.com/soap/inbound/?wsdl to access the Inbound WSDL API, the URL per the new scheme is https://api.etadirect.com/soap/inbound/?wsdl.

Glossary

Term	Explanation
Activate route	Start the work day

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Term	Explanation
Activity	Entity of the Oracle Field Service Cloud system that represents any time-consuming activity of the resource
Client Application	See SOAP Client Application
Decimal degrees	Representation of latitude and longitude geographic coordinates as decimal fractions
Delivery	In this context, transportation of GPS data from external GPS service to Oracle Field Service Cloud
GPS	Global Positioning System – space-based global navigation satellite system, providing data on location of objects on the Earth in a given moment of time
ISO 8601 format	See http://en.wikipedia.org/wiki/ISO_8601
Bucket	Entity appearing on the resource tree which can contain resources of a defined type and be assigned activities
Capacity	Workforce possessing the necessary work skills available at a certain moment of time
Capacity category	Predefined set of work skills, work skill groups and time slots within which they are considered by the Capacity Management API
Customer	End-customer, entity that benefits from the activity
ISO 8601 format	see *http://en.wikipedia.org/wiki/ISO_8601*
SOAP	Lightweight protocol for exchange of information in a decentralized, distributed environment
SOAP 1.1	See http://www.w3.org/TR/2000/NOTE-SOAP-20000508/
SOAP Interface	Interface used to receive requests and return responses via SOAP
SOAP Client Application	Application running at the Client's site and providing interaction with Oracle Field Service Cloud server via SOAP
SOAP Fault	SOAP element used to carry error and/or status information in a SOAP message
SOAP Faultcode	SOAP element intended to be used by software to provide an algorithmic mechanism for identifying the fault
SOAP Faultstring	SOAP element intended to provide a human readable explanation of the fault and not intended for algorithmic processing
User	1) Person using Oracle Field Service Cloud 2) Entity used for authentication and authorization, allowing people or external software to access Oracle Field Service Cloud

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2 **GPS API Overview**

GPS API Overview

The aim of the GPS module is to support integration of the OFSC system with external GPS-based systems, providing position tracking of GPS-enabled devices (hereinafter – the objects).

This module works as a data cache and security firewall, and allows providing GPS data to OFSC quickly and safely.

The GPS interface provides OFSC with data that enables it to see the current and earlier positions of an object on the map, and shows their trace (it is shown as a sequence of blue dots).
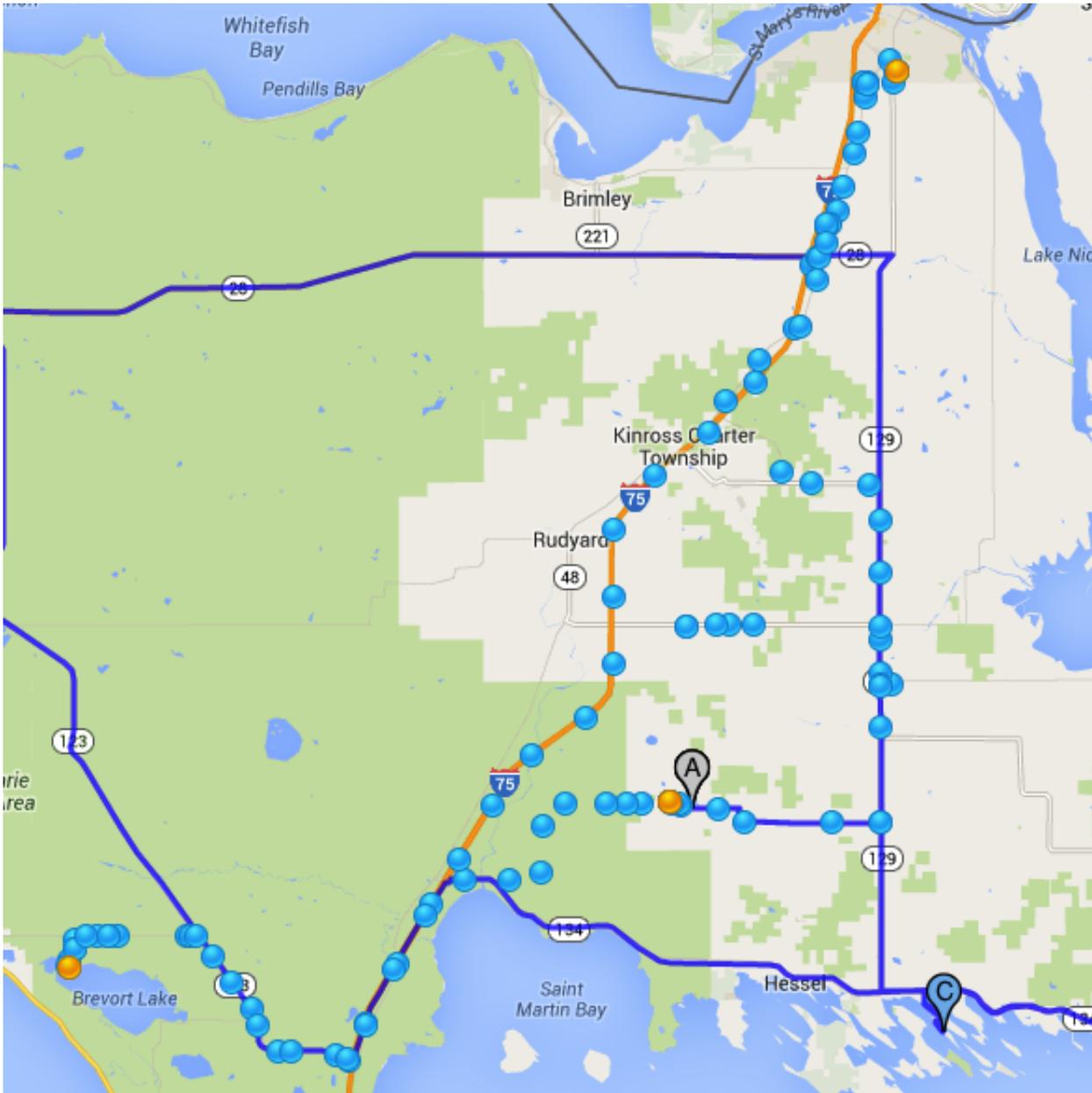
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3 Accessing the GPS API

User Authentication Structure

All API methods use the 'user' structure as authentication to determine the permissions of the Oracle Field Service Cloud client company user.

The following table describes the Oracle Field Service Cloud SOAP authentication structure mandatory fields.

Name	Type	Description
now	string	current time in ISO 8601 format
company	string	case-insensitive identifier of the Client for which data is to be retrieved
		provided by Oracle during integration
login	string	case-insensitive identifier of a specific user within the Company
		provided by Oracle during integration
auth_string	string	authentication hash;
		Use one of the following:
		• auth_string = SHA256(now + SHA256(password+SHA256(login)));
		where, 'password' is a case-sensitive set of characters used for user authentication provided by Oracle during integration.
		• auth_string = md5(now + md5(password));
		where, 'password' is a case-sensitive set of characters used for user authentication provided by Oracle during integration.

For example:

For the password "secret123", login "soap", and date "2014-01-10T13:56:50Z", the auth_string is calculated as follows:

auth_string = SHA256("2014-01-10T13:56:50Z" + SHA256("secret123" + SHA256("soap"))) = b477d40346ab40f1a1a038843d88e661fa293bec5cc63359895ab4923051002a

<user>

<now>2014-01-10T13:56:50Z</now>

<login>soap</login>

<company>in132</company>

<auth_string>b477d40346ab40f1a1a038843d88e661fa293bec5cc63359895ab4923051002a</auth_string>

Authentication

The 'user' structure is used for the request authentication. The relevant error is returned if the authentication fails.

If you created a login policy to allow access for only certain IP addresses, the login policy is applicable to the APIs as well.

For example, you defined to allow requests only from IP address 110.0.133.185 for a User Type="API_User" and with login policy "API_login_policy". This implies that authentication fails for a user accessing the APIs from an IP address other than 110.0.133.18, though the login credentials are correct.

Number	Login	Description
1	now	is different from the current time on the server and this difference exceeds the predefined time-window (30 minutes by default)
2	company	cannot be found in the Oracle Field Service Cloud
3	login	cannot be found for this company
4	user with this 'login' is not authorized to use the current method	
5	auth_string	is not equal to md5(now+md5(password)) or auth_string = SHA256(now + SHA256(password+SHA256(login)));;
		For example: 'now' = "2005-07-07T09:25:02+00:00" and password = "Pa$$w0rD" then md5 (password) = "06395148c998f3388e87f222bfd5c84b" concatenated string = = "2005-0707T09:25:02+00:0006395148c998f3388e87f222bfd5c84b" auth_string should be: auth_string = "62469089f554d7a38bacd9be3f29a989"

Otherwise authentication is successful and the request is processed further.

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4   **GPS API Methods**

GPS API Methods

There following operations are used to deliver GPS data by means of SOAP:

The following table describes the GPS API methods.

Method	Can be used to...	Description
set_position	...update the object position	Enables the external system to update information about last known position(s) of the objects(s) specified by the identifier(s)
get_position	… obtain information on the object position	Enables OFSC to obtain information about the last known position of the objects(s) specified by the identifier(s) and (optionally) history of their movement

5 GPS API Methods Description

'set_position' Method

The 'set_position' method is used to update the position of an object. Several objects and their GPS coordinates and timestamps can be specified in one transaction.

'set_position' Request

The 'set_position' method request specifies:

- the identifier of the object whose position is to be updated
- the geographic coordinates to be set for the specified object
- the time when the object was at the position defined by the coordinates

All method parameters are mandatory (if any mandatory parameter is missing, the corresponding error is returned).

The following table describes the 'set_position' request parameters.

Name	Required	Type	Description
authentication elements	Yes	struct	authentication structure
data	Yes	struct	array of 'item' elements each corresponding to a single object whose position is to be defined

- 'item' Element of 'set_position' Request

Each 'item' element represents an object whose position is to be defined and contains the following mandatory elements:

Name	Required	Type	Description
id	Yes	string	case-sensitive object identifier; can be an object login, name, external ID, etc.
latitude	Yes	float	geographical latitude (Greenwich Geographical Coordinates in decimal degrees)
longitude	Yes	float	geographical longitude (Greenwich Geographical Coordinates in decimal degrees)
timestamp	Yes	DateTime	timestamp in the YYYY-MM-DD HH:MM:SS format

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'set_position' Request Example

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
 xmlns:ns1="urn:toatech:Positioning:1.0">
 <SOAP-ENV:Body>
 <ns1:set_position>
 <now>2014-05-15T17:10:51+00:00</now>
 <login>soap</login>
 <company>in132</company>
 <auth_string>238165d8d5603c670cecfb6b4faeb698</auth_string>
 <data>
 <item>
 <id>22</id>
 <latitude>23.99</latitude>
 <longitude>32.5</longitude>
 <timestamp>2014-05-15T14:22:54</timestamp>
 </item>
 <item>
 <id>HARTWIG, Luis</id>
 <latitude>20.00</latitude>
 <longitude>32.5</longitude>
 <timestamp>2014-05-15T12:10:15</timestamp>
 </item>
 </data>
 </ns1:set_position>
 </SOAP-ENV:'data' ArrayBody> <
/SOAP-ENV:Envelope>
```

'set_position' Response

If the transaction fails, a fault response is returned. Upon a successful transaction, the 'set_position' method returns the number of successfully updated objects.

The following table describes the 'set_position' response parameters.

Name	Type	Description
return	int	number of updated objects

'set_position' Response Example

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
 xmlns:ns1="urn:toatech:Positioning:1.0">
 <SOAP-ENV:Body>
 <ns1:set_positionResponse>
 <return>2</return>
 </ns1:set_positionResponse>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

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'get_position' Method

The 'get_position' method is used to retrieve GPS coordinates of the object(s) on the basis of object identifiers and timeframe specified.

'get_position' Request

A 'get_position' request contains the following elements:

Name	Required	Type	Description
authentication elements	Yes	struct	authentication structure
ids	Yes	struct	array of 'item' elements each containing a case-sensitive object identifier; can be an object login, name, external ID, etc.
			At least one 'item' element is mandatory.
timefrom	Yes	DateTime	beginning of the search interval in the YYYY-MM-DD HH:MM:SS format
timeto	Yes	DateTime	end of the search interval in the YYYY-MM-DD HH:MM:SS format
history	No	bool	option defining whether the request should return the history of the object(s) movement (the list of coordinates with the corerspondign timestamps) within the interval defined with the 'timefrom' and 'timeto' parameters
			default value: false

'get_position' Request Example

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ns1="urn:toatech:Positioning:1.0">
<SOAP-ENV:Body>
<ns1:get_position>
<now>2014-08-14T16:51:53Z</now>
<login>soap</login>
<company>in132</company>
<auth_string>ef8c4c522657e55f928b128b8d259b97</auth_string>
<ids>
<item>1022</item>
<item>1023</item>
<item>1024</item>
</ids>
<timefrom>2012-02-14T00:00:01</timefrom>
<timeto>2012-02-14T23:59:59</timeto>
```

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```
    <history>true</history>
    </ns1:get_position>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

'get_position' Response

If the transaction fails, a fault response is returned. Upon a successful transaction, the 'get_position' response consists of a 'return' element containing the GPS data of the objects specified in the request. The 'return' element is an array of 'item' elements each corresponding to a single object specified in the request.

The following table describes the 'get_position' response parameters.

Name	Type	Description
id	string	object identifier
status	int	transaction status code for the object identified with the 'id' parameter. possible values: 0 – 'id' found, coordinates returned 1 – 'id' not found, no coordinates returned 2 – 'id' found, but no GPS coordinates correspond to the specified time frame. No coordinates returned
coordinates	struct	array of 0 or more 'item' elements each containing data on the GPS position of a single object
authentication elements	struct	authentication structure

- 'item' Element of 'get_position' Response

Each 'item' element represents an object whose position is to be defined and contains the following mandatory elements:

Name	Type	Description
latitude	float	geographical latitude (Greenwich Geographical Coordinates in decimal degrees)
longitude	float	geographical longitude (Greenwich Geographical Coordinates in decimal degrees)
timestamp	DateTime	timestamp in the YYYY-MM-DD HH:MM:SS format

The 'item' elements in the 'coordinates' array are sorted by the 'timestamp', so that later (newer) records are located higher.

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'get_position' Response Examples

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
 xmlns:ns1="urn:toatech:Positioning:1.0">
 <SOAP-ENV:Body>
 <ns1:get_positionResponse>
 <return>
 <item>
 <id>12345</id>
 <status>1</status>
 <coordinates/>
 </item>
 <item>
 <id>12346</id>
 <status>1</status>
 <coordinates/>
 </item>
 </return>
 </ns1:get_positionResponse>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

- 'get_position' Response Containing Objects Coordinates

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
 xmlns:ns1="urn:toatech:Positioning:1.0">
 <SOAP-ENV:Body>
 <ns1:get_positionResponse>
 <return>
 <item>
 <id>1022</id>
 <status>0</status>
 <coordinates>
 <item>
 <latitude>38.99</latitude>
 <longitude>31.2</longitude>
 <timestamp>2012-05-31T19:29:54Z</timestamp>
 </item>
 </coordinates>
 </item>
 <item>
 <id>1023</id>
 <status>0</status>
 <coordinates>
 <item>
 <latitude>23.99</latitude>
 <longitude>32.2</longitude>
 <timestamp>2012-05-31T19:29:54Z</timestamp>
 </item>
 </coordinates>
 </item>
 <item>
 <id>1024</id>
 <status>0</status>
 <coordinates>
 <item>
 <latitude>40.94</latitude>
 <longitude>33.2</longitude>
 <timestamp>2012-05-31T19:29:54Z</timestamp>
 </item>
 </coordinates>
```

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```
        </return>
        </ns1:get_positionResponse>
        </SOAP-ENV:Body>
    </SOAP-ENV:Envelope>
```

6 **Fault Responses**

Fault Responses

Upon transaction error Fault Responses are returned. Fault response contains a faultcode and faultstring of an error message.

Error Messages

Each error message is either a SOAP Fault message, or an HTTP error, or a ResourceElement error. GPS Interface responses can contain the following error messages:

Type	Code	Message	Occurs When
HTTP error	404	Not Found	Request method is not POST (except when getting WSDL)
SOAP Fault	Server	Procedure 'X' not present	Method name is not 'get_position' or 'set_position'
	Server	SOAP-ERROR: Encoding: Violation of encoding rules	in the 'set_position' method, the value of latitude or longitude is specified incorrectly
	Client	Authentication failed	Invalid credentials are passed in request
	Client	Wrong parameter format	Request format is invalid
	Client	Invalid interval of time was specified	In the 'get_position' method, the value of 'timeto' is less than 'timefrom'
	Server	Database error	Server cannot connect to database or execute query
	Client	Invalid value of geographic coordinate(s)	In the 'set_position' method, abs(latitude) > 90˚ or abs(longitude) > 180˚
	Client	Bad Request	Request is not valid XML
ResourceElement status	1		In the 'get_position' method, no data found for the specified interval

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Fault Response Example

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
 <SOAP-ENV:Body>
 <SOAP-ENV:Fault>
 <faultcode>SOAP-ENV:Client</faultcode>
 <faultstring>Bad Request</faultstring>
 </SOAP-ENV:Fault>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```