RTPI REST Web Services

Specification

REVISION HISTORY

Version:	Author:	Date:	Comments:
1.0	Andrzej Kroczynski	2012-01-24	
1.1	Andrzej Kroczynski	2012-02-02	Added requested changes
1.2	Andrzej Kroczynski	2012-07-18	Added due time field to real time information results
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1.4	Andrzej Kroczynski	2012-07-23	Changed route information – moved operator reference to results
1.5	Andrzej Kroczynski	2012-08-06	New web service methods to get operators list and to get last update timestamp for referenced data
1.6	Andrzej Kroczynski	2012-08-22	New web service to get list of routes
1.7	Andrzej Kroczynski	2012-10-29	CR1 changes

APPROVALS

Version:	Approved By	Date:	Comments:

DISTRIBUTION

Name	Title	Date:	Version

1.   CONTENTS

2.   INTRODUCTION

2.1.   Purpose

This document describes RTPI REST Web Services API interface that will be available to retrieve real time bus information, timetables and bus stops.

3. OVERALL DESCRIPTION

3.1. Requirements Summary

System will provide RTPI data to consumers over the internet. Example of services using the system:

- SMS Services

- Smartphone applications

- Web based applications

- Automated Feeds (e.g. twitter / RSS)

- External API

3.2. Overview

RTPI REST Web Services API (RRWS API) provides REST interface to retrieve information on real time bus information, timetables and bus stops.

Each method available in RRWS API will be invoked using plain HTTP Request (GET method). Depending on parameters provided, result will be returned either in XML or JSON format (if format is not provided then JSON is used by default). Response will contain requested information (see method specification for details) and error status of the request.

3.3. Response Error Codes

Following error codes are defined in the system:

Error Code	Description
0	Success
1	No Results
2	Missing Parameter
3	Invalid Parameter
4	Scheduled Downtime
5	Unexpected System Error

Error code is included in response for each message. For some error codes additional details will be provided in free text format (Error Message field).

3.4. Methods

3.4.1. Retrieve Real Time Bus Information

Method	http://[rtpiserver]/realtimebusinformation?stopid=[stopid]&routeid=[routeid]&maxresults&operator= [operator]&format=[format]
Description	Method to retrieve real time bus information for given stop number and route
Parameters	- *stopid* - required, existing bus stop id - *routeid* – optional, route identifier - *maxresults* – optional, maximum number of results, if not provided system will limit number of results depending on server configuration - *operator* – optional, bus service operator (e.g. DublinBus), if not provided information for all providers is returned - *format* – optional, valid values: xml, json; if not provided JSON format is used by default.

Response	List of buses buses arriving at a given bus stop (including route number, arrival time and destination) in JSON or XML format.
	
	JSON:
	
	`{`
	`    "errorcode" : "[Error code]",`
	`    "errormessage" : "[Additional error details]",`
	`    "numberofresults" : [Number of results],`
	`    "stopid" : [Stop id],`
	`    "timestamp" : "[Date/time information returned]",`
	`    "results" : [{`
	`        "arrivaldatetime" : "[Arrival time in dd/MM/yyyy HH:mm:ss format]",`
	`        "duetime" : "[Arrival Due time in minutes]",`
	`        "departuredatetime" : "[Departure time in dd/MM/yyyy HH:mm:ss format]",`
	`        "departureduetime" : "[Departure Due time in minutes]",`
	`        "scheduledarrivaldatetime" : "[Scheduled arrival time in`
	`                              dd/MM/yyyy HH:mm:ss format]",`
	`        "scheduleddeparturedatetime" : "[Scheduled departure time in`
	`                              dd/MM/yyyy HH:mm:ss format]",`
	`        "destination" : "[Service destination name]",`
	`        "destinationlocalized" : "[Translated service destination name]",`
	`        "origin" : "[Service origin name]",`
	`        "originlocalized" : "[Translated service origin name]",`
	`        "direction" : "[Service direction]",`
	`        "operator" : "[Bus service operator name]",`
	`        "additionalinformation" : "[Additional information]",`
	`        "lowfloorstatus" : "[Bus low floor status (yes or no)]",`
	`        "route" : "[Route]",`
	`        "sourcetimestamp" : "[Timestamp in dd/MM/yyyy HH:mm:ss format]",`
	`    },`
	`    ...`
	`    ...]`
	`}`

```xml
XML:

<realtimeinformation>
  <errorcode>[Error code]</errorcode>
  <errormessage>[Additional error details]</errormessage>
  <numberofresults>[Number of results]</numberofresults>
  <stopid>[Stop Id]</stopid>
  <timestamp>[Date/time information returned]</timestamp>
  <results>
    <result>
      <arrivaldatetime>[Arrival time in dd/MM/yyyy HH:mm:ss format]</arrivaldatetime>
      <duetime>[Dearture Due time in minutes]</duetime >
      <departuredatetime>[Departure time in
                        dd/MM/yyyy HH:mm:ss format]</departuredatetime>
      <departureduetime>[Departure Due time in minutes]</departureduetime>
      <scheduledarrivaldatetime>[Scheduled arrival time in
                              dd/MM/yyyy HH:mm:ss format]</ scheduledarrivaldatetime>
      <scheduleddeparturedatetime>[Scheduled departure time in dd/MM/yyyy HH:mm:ss
                                  format]</ scheduleddeparturedatetime>
      <destination>[Service destination name]</destination>
      <destinationlocalized>[Translated service destination name]</destinationlocalized>
      <origin>[Service origin name]</ origin>
      <originlocalized>[Translated service origin name]</ originlocalized>
      <direction>[Service direction]</ direction>
      <operator>[Bus service operator name]</operator>
      <additionalinformation>[Additional information]</additionalinformation>
      <lowfloorstatus>[Bus low floor status (yes or no)]</lowfloorstatus>
      <route>[Route]</route>
      <sourcetimestamp>[Timestamp in dd/MM/yyyy HH:mm:ss format]</sourcetimestamp>
    </result>
    ...
    ...
  </results>
</realtimeinformation>
```

3.4.2.   Retrieve Timetable Bus Information by Date

Method	http://[rtpiserver]/timetableinformation?type=day&stopid=[stopid]&routeid=[routeid]&datetime=[Date time]&maxresults=[maxresults]&operator=[operator]&format=[format]
Description	Method to retrieve timetable information for given stop number and route
Parameters	- type – required, value: day; time table information is retrieved for given day only - *stopid* - required, existing bus stop id - *routeid* – optional, route identifier - *datetime* – optional, if provided timetable information for given date/time will be returned otherwise timetable for current date/time will be returned - *maxresults* – optional, maximum number of results, if not provided system will return all results for given date - *operator* – optional, bus service operator (e.g. DublinBus), if not provided information for all providers is returned - *format* – optional, valid values: xml, json; if not provided JSON format is used by default.
Response	List of buses buses arriving at a given bus stop (including route number, arrival time and destination) in JSON or XML format. **JSON**:

```json
{
    "errorcode" : "[Error code]",
    "errormessage" : "[Additional error details]",
    "numberofresults" : [Number of results],
    "stopid" : [Stop id],
    "timestamp" : "[Date/time information returned]",
    "results" : [{
        "arrivaldatetime" : "[Arrival time in dd/MM/yyyy HH:mm:ss format]",
        "destination" : "[Service destination name]",
        "destinationlocalized" : "[Translated service destination name]",
        "operator" : "[Bus service operator name]",
        "lowfloorstatus" : "[Bus low floor status (yes or no)]",
        "route" : "[Route]"
    },
    ...
    ...]
}
```

XML:

```xml
<timetableinformation>
  <errorcode>[Error code]</errorcode>
  <errormessage>[Additional error details]</errormessage>
  <numberofresults>[Number of results]</numberofresults>
  <stopid>[Stop Id]</stopid>
  <timestamp>[Date/time information returned]</timestamp>
  <results>
    <result>
      <arrivaldatetime>[Arrival time in dd/MM/yyyy HH:mm:ss
format]</arrivaldatetime>
      <destination>[Service destination name]</destination>
      <destinationlocalized>[Translated service destination
name]</destinationlocalized>
      <operator>[Bus service operator name]</operator>
      <lowfloorstatus>[Bus low floor status (yes or no)]</lowfloorstatus>
      <route>[Route]</route>
    </result>
    ...
    ...
  </results>
</timetableinformation>
```

3.4.3. Retrieve Full Timetable Bus Information

Method	http://[rtpiserver]/timetableinformation?type=week&stopid=[stopid]&routeid=[routeid]&format=[format]
Description	Method to retrieve timetable information for given stop number and route
Parameters	- type – required, value: week; time table information is retrieved for whole week - *stopid* - required, existing bus stop id - *routeid* – required, route identifier - *format* – optional, valid values: xml, json; if not provided JSON format is used by default.
Response	Timetable for given bus stop and route in JSON or XML format. **JSON**: { "errorcode" : "[Error code]",

```
        "errormessage" : "[Additional error details]",
        "numberofresults" : [Number of results],
        "stopid" : [Stop id],
        "route" : [Route],
        "timestamp" : "[Date/time information returned]",
        "results" : [{
            "startdayofweek" : "[Day of week (0-Sunday, 1-Monday, ...)]",
            "enddayofweek" : "[Day of week (0-Sunday, 1-Monday, ...)]",
            "destination" : "[Service destination name]",
            "destinationlocalized" : "[Translated service destination name]",
            "lastupdated" : "[Last update date/time for this record]",
            "departures" : [
                "[Departure time in HH:mm:ss format]",
                ...
                ...
                ]
        },
        ...
        ...]
}
```

XML:

```xml
<timetableinformation>
  <errorcode>[Error code]</errorcode>
  <errormessage>[Additional error details]</errormessage>
  <numberofresults>[Number of results]</numberofresults>
  <stopid>[Stop Id]</stopid>
  <route>[Route]</route>
  <timestamp>[Date/time information returned]</timestamp>
  <results>
    <result>
      <startdayofweek>[Day of week (0-Sunday, 1-Monday, ...)]</startdayofweek>
      <enddayofweek>[Day of week (0-Sunday, 1-Monday, ...)]</enddayofweek>
      <destination>[Service destination name]</destination>
      <destinationlocalized>[Translated service destination
name]</destinationlocalized>
      <lastupdated>[Last update date/time for this record]</lastupdated>
      <departures>
        <departure>[Departure time in HH:mm:ss format]</departure>
        ...
        ...
      </departures>
    </result>
    ...
```

```
        ...
    </results>
</timetableinformation>
```

3.4.4.　　　Retrieve Bus Stop Information

Method	http://[rtpiserver]/busstopinformation?stopid=[stopid]&stopname=[stopname]&format=[format]
Description	Function to retrieve bus stops defined in the system
Parameters	- *stopid* - optional, bus stop id, if not provided all bus stops are returned - *stopname* – optional, stop name, only matching stops are returned - *operator* – optional, if provided retrieves data only for given operator - *format* – optional, valid values: xml, json; if not provided JSON format is used by default.

Response	List of stops defined in the system in JSON or XML format.
	
	JSON:
	
	`{`
	`    "errorcode" : "[Error code]",`
	`    "errormessage" : "[Additional error details]",`
	`    "numberofresults" : [Number of results],`
	`    "timestamp" : "[Date/time information returned]",`
	`    "results" : [{`
	`        "stopid" : "[Stop Id]",`
	`        "displaystopid" : "[Stop Identifier to display for the end user]",`
	`        "shortname" : "[Stop Name]",`
	`        "shortnamelocalized" : "[Translated Stop Name]",`
	`        "fullname" : "[Full Name]",`
	`        "fullnamelocalized" : "[Translated Full Name]",`
	`        "latitude" : "[latitude]",`
	`        "longitude" : "[longitude]",`
	`        "lastupdated" : "[Last update date/time for this record]",`
	`        "operators" : [`
	`            "name" : "[Operator Name]",`
	`            "routes" : [`
	`                "[Route Number]",`
	`                ...`
	`                ...`
	`              ]`
	`          ...`
	`          ...`
	`          ]`
	
	`    },`
	`    ...`
	`    ...`
	`    ...]`
	`}`
	
	XML:

```xml
<busstopinformation>
  <errorcode>[Error code]</errorcode>
  <errormessage>[Additional error details]</errormessage>
  <numberofresults>[Number of results]</numberofresults>
  <timestamp>[Date/time information returned]</timestamp>
  <results>
    <result>
      <stopid>[Stop Id]</stopid>
      <displaystopid>[ Stop Identifier to display for the
                      end user]</displaystopid>
      <shortname>[Stop Name]</shortname>
      <shortnamelocalized>[Translated Stop Name]</shortnamelocalized>
      <fullname>[Full Name]</fullname>
      <fullnamelocalized>[Translated Full Name]</fullnamelocalized>
      <latitude>[latitude]</ latitude>
      <longitude>[longitude]</ longitude>
      <lastupdated>[Last update date/time for this record]</lastupdated>
      <operators>
        <operator>
          <name>[Operator name]</name>
          <routes>
            <route>[route number]</route>
            ...
            ...
          </routes>
        </operator>
        ...
        ...
      </operators>
    </result>
    ...
    ...
    ...
  </results>
</busstopinformation>
```

3.4.5.　　　　Retrieve Route Information

Method	http://[rtpiserver]/routeinformation?routeid=[route]&operator=[operator]&format=[format]
Description	Function to retrieve route details defined in the system
Parameters	- *route* - required, requested route id - *operator* – required, operator id - *format* – optional, valid values: xml, json; if not provided JSON format is used by default.
Response	List of routes and bus stops defined in the system in JSON or XML format. **JSON**: {

```json
            "errorcode" : "[Error code]",
            "errormessage" : "[Additional error details]",
            "numberofresults" : [Number of results],
            "route" : "[Route]",
            "timestamp" : "[Date/time information returned]",
            "results" : [{
                "operator" : "[Operator name]",
                "origin" : "[Origin name]",
                "origintranslated" : "[translated origin name]",
                "destination" : "[Destination name]",
                "destinationtranslated" : "[Translated destination name]",
                "lastupdated" : "[Last update date/time for this record]",
                "stops" : [{
                        "stopid" : "[Stop Id]",
                        "displaystopid" : "[Stop Identifier to display for the end user]",
                        "shortname" : "[Stop Name]",
                        "shortnamelocalized" : "[Translated Stop Name]",
                        "fullname" : "[Full Name]",
                        "fullnamelocalized" : "[Translated Full Name]",
                        "latitude" : "[latitude]"
                        "longitude" : "[longitude]"
                        },
                        ...
                        ...]
        },
        ...
        ...]
}
```

XML:

```xml
<routeinformation>
  <errorcode>[Error code]</errorcode>
  <errormessage>[Additional error details]</errormessage>
  <numberofresults>[Number of results]</numberofresults>
  <route>[Date/time information returned]</route>
  <timestamp>[Date/time information returned]</timestamp>
  <results>
   <result>
     <operator>[Operator name]</operator>
     <origin>[Origin name]</origin>
     <originlocalized>[Translated origin name]</originlocalized>
     <destination>[Destination Name]</destination>
     <destinationlocalized>[Translated destination name]</destinationlocalized>
     <lastupdated>[Last update date/time for this record]</lastupdated>
     <stops>
       <stop>
         <stopid>[Stop Id]</stopid>
         <displaystopid>[ Stop Identifier to display for the
                       end user]</displaystopid>
         <shortname>[Stop Name]</shortname>
         <shortnamelocalized>[Translated Stop Name]</shortnamelocalized>
         <fullname>[Full Name]</fullname>
         <fullnamelocalized>[Translated Full Name]</fullnamelocalized>
         <latitude>[latitude]</ latitude>
         <longitude>[longitude]</ longitude>
       <stop>
    <stops>
   </result>
   ...
   ...
```

```
        ...
    </results>
</routeinformation>
```

3.4.6.   Retrieve Operator Information

Method	**http://[rtpiserver]/operatorinformation?format=[format]**
Description	Function to retrieve information about route operators defined in the system
Parameters	- *format* – optional, valid values: xml, json; if not provided JSON format is used by default.

Response	List of all operators in the system in JSON or XML format.
	
	JSON:
	
	``
	{
	    "errorcode" : "[Error code]",
	    "errormessage" : "[Additional error details]",
	    "numberofresults" : [Number of results],
	    "timestamp" : "[Date/time information returned]",
	    "results" : [{
	        "operatorreference" : "[Operator reference code]",
	        "operatorname" : "[Operator name]",
	        "operatordescription" : "[Operator description]"
	
	    },
	    ...
	    ...]
	}
	``
	
	XML:
	
	``
	<operatorinformation>
	  <errorcode>[Error code]</errorcode>
	  <errormessage>[Additional error details]</errormessage>
	  <numberofresults>[Number of results]</numberofresults>
	  <timestamp>[Date/time information returned]</timestamp>
	  <results>
	    <result>
	      <operatorreference>[Operator reference code]</operatorreference>
	      <operatorname>[Operator name]</operatorname>
	      <operatordescription>[Operator description]</operatordescription>
	    </result>
	    ...
	    ...
	    ...
	  </results>
	</operatorinformation>
	``

3.4.7. Retrieve Route List Information

Method	http://[rtpiserver]/routelistinformation? operator=[operator]&format=[format]
Description	Function to retrieve list of routes defined in the system
Parameters	- *operator* – optional, if provided retrieves data only for given operator - *format* – optional, valid values: xml, json; if not provided JSON format is used by default.

Response	List of routes defined in the system in JSON or XML format.
	
	JSON:
	
	`{`
	`    "errorcode" : "[Error code]",`
	`    "errormessage" : "[Additional error details]",`
	`    "numberofresults" : [Number of results],`
	`    "timestamp" : "[Date/time information returned]",`
	`    "results" : [{`
	`        "operator" : "[Operator Reference]",`
	`        "route" : "[Route]"`
	`    },`
	`    ...`
	`    ...]`
	`}`
	
	XML:
	
	`<routelistinformation>`
	`  <errorcode>[Error code]</errorcode>`
	`  <errormessage>[Additional error details]</errormessage>`
	`  <numberofresults>[Number of results]</numberofresults>`
	`  <timestamp>[Date/time information returned]</timestamp>`
	`  <results>`
	`    <result>`
	`      <operator>[Operator reference]</operator>`
	`      <route>[Route]</route>`
	`    </result>`
	`    ...`
	`    ...`
	`    ...`
	`  </results>`
	`</routelistinformation>`