Network Rail Data Feeds Developer Pack

V2.0

Contents

1   Introduction

The purpose of this document is to provide technical information on the Network Rail Data Feeds. This will cover the data formats and transport mechanisms, but does not cover how end users may interpret the information contained within the data feeds.

2   Available Data Feeds

There are 6 Data Feeds that a user can subscribe to. These are:

Data Feed	Description
Train Movements	The Train Movements feed provides train positioning and movement event data including incident and delay messages.
TD	The TD feed (Train Describer) provides train positioning data at signal berth level.
VSTP	The VSTP (Very Short Term Planning) feed provides schedule records via the VSTP process (and thus not available via CIF).
RTPPM	The RTPPM feed - Public Performance Measure shows the performance of trains against the timetable, measured as the percentage of trains arriving at destination.
TSR	The TSR feed contains Temporary Speed Restrictions data.
SCHEDULE	The Schedule feed is an extract of train schedules from the ITPS (Integration Train Planning System).

3 User Account Creation and Data Feeds Subscription

In order to subscribe to the Data Feeds a user account needs to be registered in the web application at the following URL:

http://datafeeds.networkrail.co.uk

Once the registration is complete it is possible log in to the web application and to choose which data fields you wish subscribe to. The available data feeds can be selected in the My Feeds page for Train Movements, TD, VSTP, TSR, RTPPM and SCHEDULE.
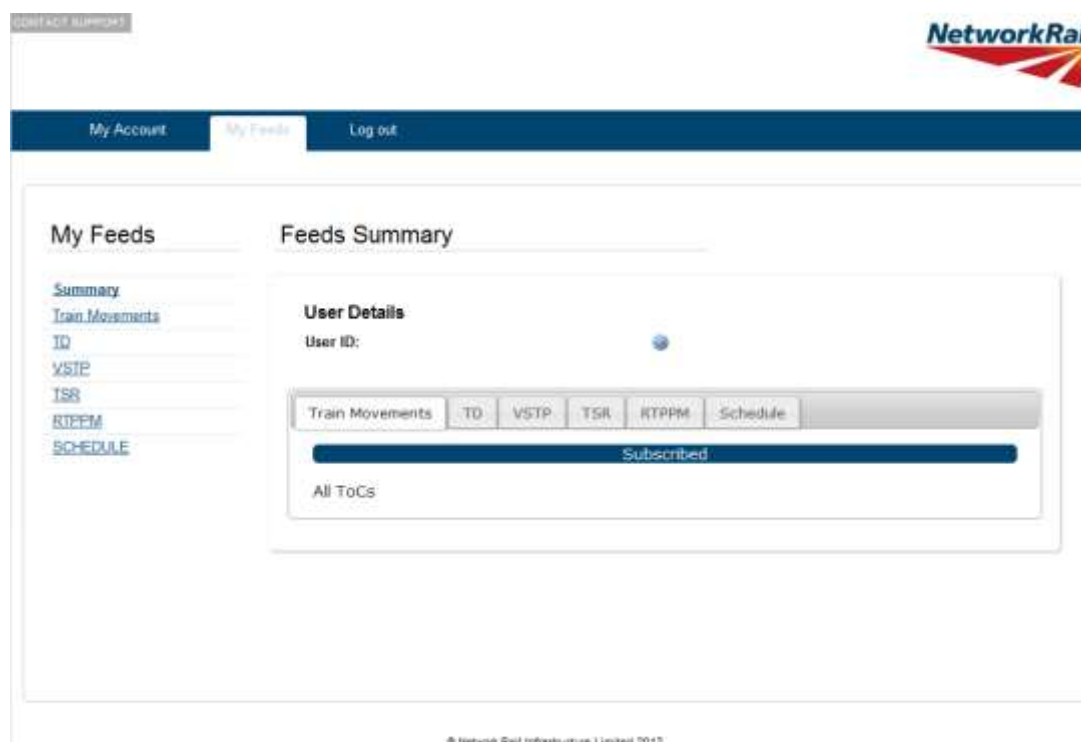
As a user your account can be in one of the following states:

User State	Log in	Subscribe to Feeds	Download Data
Pending	✓	✓	✗
Active	✓	✓	✓
Inactive	✓	✓	✗
Disabled	✗	✗	✗
Deleted	✗	✗	✗

The user account must be in Active status in order to be able to receive data from the feeds. If capacity exists on the Network Rail Data Feeds platform the account will be Active within 1 hour after registration.

If the account is not used for 30 days then it will be automatically transitioned to the Inactive status and you will be able to access any data feeds. You can request reactivation of your account from the web application.

Your account will only become Active if there is sufficient capacity on the system. If there is not sufficient capacity at the time of your request, your request will be queued and you will be automatically activated when free capacity becomes available. You will receive a confirmation email when the account becomes Active.

4   Data Feed Channels

There are two types of Data Feed Channels: real time and semi-static.

Real-time Channels publish data as JSON messages on ActiveMQ Topics.

Semi-static Channels publish data into Amazon S3 Buckets.

Individual messages on real-time channels will have a Time To Live (TTL) period of 5 minutes to ensure that your clients have access to recent messages should they lose connectivity and need to reconnect to one of the Data Feeds

To ensure efficient use of bandwidth, the real-time channels will have compression enabled. Additionally, given the high frequency of messages, the Train Movement and TD channels will also have messages batched according to the following rules:

- A maximum of 32 messages of a single type (Train Movements or TD) are batched into a JSON list;

- A batch of messages cover at most a 5-second interval in order to retain timeliness;

- If no messages are to be sent during an interval, an empty message is sent.

4.1 Train Movements

The Train Movement channels provide train positioning and movement event data including incident and delay messages.

The Train Movement channels are real-time channels. Freight services are not included in these channels.

This table shows the channels available on the Train Movement feed.

Actual Channel Name	Localised Name
TRAIN_MVT_ALL_TOC	All
TRAIN_MVT_PASSENGER_TOC	Passenger
TRAIN_MVT_TRUST_GENERAL	TRUST General
TRAIN_MVT_HL_TOC	Arriva Trains Wales (HL)
TRAIN_MVT_HT_TOC	c2c (HT)
TRAIN_MVT_EH_TOC	CrossCountry (EH)
TRAIN_MVT_EN_TOC	Devon & Cornwall Railways (EN)
TRAIN_MVT_EM_TOC	East Midlands Trains (EM)
TRAIN_MVT_GA_TOC	Eurostar (UK) Ltd (GA)
TRAIN_MVT_XJ_TOC	Ffestiniog Railway (XJ)

TRAIN_MVT_EG_TOC	First Capital Connect (EG)
TRAIN_MVT_EF_TOC	First Great Western (EF)
TRAIN_MVT_PF_TOC	First Hull Trains (PF)
TRAIN_MVT_HA_TOC	First Scotrail (HA)
TRAIN_MVT_EA_TOC	First Transpennine Express (EA)
TRAIN_MVT_HV_TOC	Gatwick Express Ltd (HV)
TRAIN_MVT_EC_TOC	Grand Central (EC)
TRAIN_MVT_EE_TOC	Heathrow Connect (EE)
TRAIN_MVT_HM_TOC	Heathrow Express Ltd (HM)
TRAIN_MVT_HZ_TOC	Island Lines (HZ)
TRAIN_MVT_EJ_TOC	London Midland (EJ)
TRAIN_MVT_EK_TOC	London Overground (EK)
TRAIN_MVT_XC_TOC	LUL Bakerloo Line (XC)
TRAIN_MVT_XE_TOC	LUL District Line – Richmond (XE)
TRAIN_MVT_XB_TOC	LUL District Line – Wimbledon (XB)
TRAIN_MVT_HE_TOC	Merseyrail Electrics 2002 Ltd (HE)
TRAIN_MVT_EB_TOC	National Express East Anglia (EB)
TRAIN_MVT_HB_TOC	National Express East Coast (HB)
TRAIN_MVT_PG_TOC	Nexus (PG)
TRAIN_MVT_PR_TOC	North Yorkshire Moors Railway (PR)
TRAIN_MVT_ED_TOC	Northern Rail (ED)
TRAIN_MVT_HU_TOC	Southeastern (HU)
TRAIN_MVT_HW_TOC	Southern (HW)
TRAIN_MVT_HY_TOC	Stagecoach Sth Western Trains Ltd (HY)
TRAIN_MVT_HO_TOC	The Chiltern Railway Co. Ltd (HO)
TRAIN_MVT_HF_TOC	Virgin West Coast Trains (HF)
TRAIN_MVT_PA_TOC	West Coast Railway Co. (PA)
TRAIN_MVT_EI_TOC	Wrexham & Shropshire Railway (EI)

Examples of the Train Movements JSON message are available in **Appendix 1 – Sample Train Movement JSON Message**

4.2 TD

The TD feed (Train Describer) provides train positioning data at signal berth level. This includes CA (Berth Step), CB (Berth Cancel), CC (Berth Interpose) and CT (Heartbeat) messages.

The TD channels are real-time channels.

This table shows the channels available on the TD data feed. Freight services are not included in these channels.

NOTE: THE FOLLOWING TABLE IS SUBJECT TO CHANGE AS TD CHANNELS MAY BE PRESENTED ON A PER ROUTE BASIS.

Actual Channel Name	Localised Name
TD_ALL_SIG_AREA	All
TD_SE_SIG_AREA	Scotland East
TD_SW_SIG_AREA	Scotland West
TD_LNE_NE_SIG_AREA	LNE North Eastern
TD_MC_EM_SIG_AREA	M&C East Midlands
TD_LNE_GN_SIG_AREA	LNE Great Northern
TD_LNW_LC_SIG_AREA	LNW Lancs & Cumbria
TD_LNW_C_SIG_AREA	LNW Central
TD_LNW_WMC_SIG_AREA	LNW W.Mids & Chilterns
TD_WCS_SIG_AREA	West Coast South
TD_ANG_SIG_AREA	Anglia
TD_KENT_MCC_SIG_AREA	Kent & M&C Continental
TD_SUSS_SIG_AREA	Sussex
TD_WESS_SIG_AREA	Wessex
TD_WTV_SIG_AREA	Western Thames Valley
TD_WWC_SIG_AREA	Western West Country
TD_WWM_SIG_AREA	Western Wales & Marches

4.3 VSTP

The VSTP (Very Short Term Planning) feed provides schedule records via the VSTP process (and thus not available via CIF).

The VSTP channel is a real-time channel.

This table shows the channels available on the VSTP feed.

Actual Channel Name	Localised Name
VSTP_ALL	All

An example of the VSTP JSON message is available in **Appendix 3 – Sample VSTP JSON Message**

4.4 RTPPM

The RTPPM feed - Public Performance Measure shows the performance of trains against the timetable, measured as the percentage of trains arriving at destination.

The RTPPM channel is a real-time channel. Freight services are not included in this channel.

Actual Channel Name	Localised Name
RTPPM_ALL	All

An example of the RTPPM JSON message is available in **Appendix 4 – Sample RTPPM JSON Message**

4.5 TSR

The TSR feed contains Temporary Speed Restrictions data.

The TSR channel is a real-time channel.

This table shows the channels available on the TSR feed.

Actual Channel Name	Localised Name
TSR_ALL_ROUTE	All
TSR_ANG_ROUTE	Anglia
TSR_WEST_ROUTE	Western
TSR_KENT_SUSS_ROUTE	Kent & Sussex
TSR_WESS_ROUTE	Wessex
TSR_SCOT_ROUTE	Scotland

TSR_LNE_S_ROUTE	London North Eastern (South)
TSR_LNE_C_ROUTE	London North Eastern (Central)
TSR_LNE_N_ROUTE	London North Eastern (North)
TSR_LNW_S_ROUTE	London North Western (South)
TSR_LNW_N_ROUTE	London North Western (North)
TSR_EM_ROUTE	East Midlands

4.6 SCHEDULE

The Schedule feed is an extract of train schedules from the Integration Train Planning System.

NOTE: THIS INFORMATION IS SUBJECT TO CHANGE AND MAY BE PRESENTED AS A SINGLE ALL TOC WEEKLY CIF WITH DAILY ALL TOC UPDATES.

The Schedule channel is a semi-static channel and information is published into Amazon S3 buckets.

5   Connecting to Data Feed Channels

5.1 ActiveMQ Topics

ActiveMQ Topics distribute the message-based data sources; namely Train Movements, TD, VSTP, TSR & RTPPM.

Topics are a Publish-Subscribe design pattern that enables many clients to subscribe to a single channel with READ access. This is a one-to-many broadcast mechanism.

The channels will be output using the Stomp protocol.

5.1.1   Stomp Security

Stomp implementation fully supports an ActiveMQ security mechanism. This means that the CONNECT command will return an ERROR frame on unsuccessful authentication. Also, the authorization policies will be applied when you try to access (read/write) certain destinations. If you use synchronous operations (by using receipts), you can expect an ERROR frame in case of unauthorized access attempt. In other case, operations will be discarded but the client will not be informed of errors. This also stands for all other errors that can happen on the broker side.

5.1.2   Working with Destinations with Stomp

Note that the prefix in stomp /queue/ or /topic/ is removed from the string before passing it to ActiveMQ as a JMS destination. Also note that the default separator in MOM systems is. (DOT). So DATA.FEEDS is the normal syntax of a MOM queue - the Stomp equivalent would be /queue/DATA.FEEDS

Be careful about starting destinations with / .

For those familiar with JMS, where you would use 'data/feeds', in JMS, you would use '/queue/data/feeds' in Stomp.

5.1.3   Connection Details

To connect to the topics using Stomp use the following details:

Hostname: datafeeds.networkrail.co.uk

Port: 61618

5.2 Amazon S3

The CIF files from the SCHEDULE feed are available on Amazon's Simple Storage Service (S3) and can be accessible by the following APIs:

•   Amazon S3 SOAP http://docs.amazonwebservices.com/AmazonS3/latest/API/SOAPGetObject.html

•   Amazon S3 REST http://docs.amazonwebservices.com/AmazonS3/latest/API/RESTObjectGET.html

Further details for how to download the CIF files TBC

6   Implementation Examples

This section contains information on how to implement a Stomp client using Java, PHP and Ruby to connect to the Data Feeds.

6.1 Java

Since version 5.2, there is a simple Java Stomp API distributed with ActiveMQ. The following code snippet provides a simple example of using this API:

```java
StompConnection connection = new StompConnection();
connection.open("hostname", port);

connection.connect("system", "manager");
StompFrame connect = connection.receive();
if (!connect.getAction().equals(Stomp.Responses.CONNECTED)) {
     throw new Exception ("Not connected");
}

connection.begin("tx1");
connection.send("/topic/test", "message1", "tx1", null);
connection.send("/topic/test", "message2", "tx1", null);
connection.commit("tx1");

connection.subscribe("/topic/test", Subscribe.AckModeValues.CLIENT);

connection.begin("tx2");

StompFrame message = connection.receive();
System.out.println(message.getBody());
connection.ack(message, "tx2");

message = connection.receive();
System.out.println(message.getBody());
connection.ack(message, "tx2");

connection.commit("tx2");

connection.disconnect();
```

This example is distributed with the ActiveMQ distribution. You can run it from the example folder with

```
ant stomp
```

6.2 PHP

Obtain the source of the library by downloading the distribution and add its content to your include_path. Alternatively, you can grab the source and add src/main folder to your include_path.

Examples are located in src/examples folder. Before running them, be sure you have installed this library properly and you have started ActiveMQ broker (recommended version 5.5.0 or higher) with Stomp connector enabled.

You can start the first example by running

```
cd examples
php first.php
```

Also, be sure to check comments in the particular examples for some special configuration steps (if needed).

6.2.1   PHP Example

The simplest example shows how you can connect to the ActiveMQ message broker and send/receive a message from the queue.

```php
<?
    // include a library
    require_once("Stomp.php");
    // make a connection
    $con = new Stomp("tcp://hostname:port");
    // connect
    $con->connect();
    // subscribe to the topic
    $con->subscribe("/topic/test");
    // receive a message from the topic
    $msg = $con->readFrame();

    // do what you want with the message
    if ( $msg != null) {
        echo "Received message with body '$msg->body'\n";
        // mark the message as received in the queue
        $con->ack($msg);
    } else {
        echo "Failed to receive a message\n";
    }

    // disconnect
    $con->disconnect();
?>
```

6.2.2   Durable Subscribers

Durable topic subscribers are not part of the Stomp protocol, but an ActiveMQ feature that allow topic subscribers to receive messages sent to the topic while there were offline.

Stomp protocol implementation in ActiveMQ enables this feature for Stomp subscribers as well. To use this feature, first you need to define a client id your consumer will use, like this

```php
<?
    $consumer = new Stomp("tcp://hostname:port");
```

```
    $consumer->clientId = "test";
?>
```

Next, you client need to provide this id while subscribing to the topic. This is done by passing

special `activemq.subcriptionName` header along with the SUBSCRIBE frame. But once, you've set the client id to your consumer, PHP Stomp client will do this work for you. So you can subscribe to the topic, just as you'd normally do

```
<?

    $consumer->subscribe("/topic/test");

?>
```

6.3 Ruby

6.3.1 Overview

This is sample code in `ActiveMQInstallDir/example/ruby` that enables you to experiment with the Stomp protocol in the Ruby programming language.

6.3.2 Example prerequisites

You must download and install the requisite packages to support the Ruby programming language before you can run the Stomp example. Install the following packages:

- *Ruby programming language*—download and install the Ruby programming language from http://www.ruby-lang.org/en/downloads. Add the Ruby `/bin` directory to your `PATH`.
- *RubyGems package manager*—RubyGems (http://www.rubygems.org) is a utility for installing and managing add-ons to the Ruby language. Download and install RubyGems as follows:
    1. Download a RubyGems archive file (`.tgz`, `.zip`, or `.gem`) from the RubyForge (http://rubyforge.org/frs/?group_id=126).
    2. Unzip the RubyGems archive.
    3. Initialize RubyGems by entering the following command:

       ```
       ruby GemsInstallDir/setup.rb
       ```

    4. Add `GemsInstallDir/bin` to your `PATH`.
- *Stomp package for Ruby*—install the Stomp package for Ruby by running the following command:

    ```
    gem install stomp
    ```

    RubyGems downloads and installs the requisite package to support the Ruby Stomp client API.

To try out the Stomp protocol, perform the following steps.

6.3.3 Configure the broker

Check that the the Stomp connector is present in the broker configuration file (in `InstallDir/conf/activemq.xml`) as follows:

```
<beans>
    ...
    <transportConnectors>
      ...
      <transportConnector name="stomp"   uri="stomp://hostname:port"/>
    </transportConnectors>
    ...
</beans>
```

6.3.4   Run the broker

Run the default broker by entering the following at a command line:

```
activemq
```

The default broker automatically takes its configuration from the default configuration file.

> **Note**
>
> The `activemq` script automatically sets the
> `ACTIVEMQ_HOME` and `ACTIVEMQ_BASE` environment variables to *FuseInstallDir*/`fuse-message-broker-`*Version* by default. If you want the `activemq` script to pick up its configuration from a non-default `conf` directory, you can set `ACTIVEMQ_BASE` explicitly in your environment. The configuration files will then be taken from `$ACTIVEMQ_BASE/conf`.

6.3.5   Run the Ruby listener

To connect the listener tool to the `stomp://`*hostname*:*port* endpoint (Stomp over TCP), change directory to *ActiveMQInstallDir*/`example/ruby` and enter the following command:

```
ruby listener.rb
```

They Ruby listener connects to the endpoint, `stomp://`*hostname*:*port*, by default. You could change this endpoint address by editing the `listener.rb` script.

6.3.6   Run the Ruby publisher

To connect the publisher tool to the `stomp://`*hostname*:*port* endpoint (Stomp over TCP), change directory to *ActiveMQInstallDir*/`example/ruby` and enter the following command:

```
ruby publisher.rb
```

You should see some output like the following:

```
Sent 1000 messages

Sent 2000 messages

Sent 3000 messages

Sent 4000 messages

Sent 5000 messages

Sent 6000 messages

Sent 7000 messages

Sent 8000 messages

Sent 9000 messages

Sent 10000 messages

Received report: Received 10000 in 4.567 seconds, remaining: 9
```

6.3.7   Example Ruby Client Code

```ruby
require 'rubygems'
require 'stomp'

begin

    @port = port
```

```
    @host = "hostname"
    @user = ENV["STOMP_USER"];
    @password = ENV["STOMP_PASSWORD"]

    @host = ENV["STOMP_HOST"] if ENV["STOMP_HOST"] != NIL
    @port = ENV["STOMP_PORT"] if ENV["STOMP_PORT"] != NIL

    @destination = "/topic/stompcat"
    @destination = $*[0] if $*[0] != NIL

    $stderr.print "Connecting to stomp://#{@host}:#{@port} as #{@user}\n"
    @conn = Stomp::Connection.open @user, @password, @host, @port, true
    $stderr.print "Getting output from #{@destination}\n"

    @conn.subscribe @destination, { :ack =>"client" }
    while true
        @msg = @conn.receive
        $stdout.print @msg.body
        $stdout.flush
        @conn.ack @msg.headers["message-id"]
    end
    @conn.disconnect

rescue
end
```

7 Appendices

7.1 Appendix 1 – Sample Train Movement JSON Message

Message 1 – 0001 – Activation Message

```
{
  "header": {
    "msg_type": "0001",
    "source_dev_id": "E0000000",
    "user_id": "NETWORK9",
    "original_data_source": "TOPS",
    "msg_queue_timestamp": "1263825942000",
    "source_system_id": "TRUST"
  },
  "body": {
    "schedule_source": "V",
    "train_file_address": "001",
    "schedule_end_date": "2006-06-09",
    "train_id": "1214567890",
    "tp_origin_timestamp": "2006-02-08",
    "creation_timestamp": "1170937266000",
    "tp_origin_stanox": "",
    "origin_dep_timestamp": "1170928800000",
    "train_service_code": "22112001",
    "toc_id": "65",
    "d1266_record_number": "00230",
    "train_call_type": "AUTOMATIC",
    "train_uid": "C12664",
    "train_call_mode": "NORMAL",
    "schedule_type": "P",
    "sched_origin_stanox": "07257",
    "schedule_wtt_id": "1M99M",
    "schedule_start_date": "2005-12-12"
  }
}
```

Message 2 – 0002 – Cancellation

```
{
  "header": {
    "msg_type": "0002",
    "source_dev_id": "VRX6",
    "user_id": "#QRP4099",
    "original_data_source": "SDR",
    "msg_queue_timestamp": "1286962693000",
    "source_system_id": "TRUST"
  },
  "body": {
    "train_file_address": null,
    "train_service_code": "24680004",
    "orig_loc_stanox": "",
    "toc_id": "91",
    "dep_timestamp": "1286960880000",
    "division_code": "91",
```

```
    "loc_stanox": "72359",
    "canx_timestamp": "1286966280000",
    "canx_reason_code": "TX",
    "train_id": "722H36ME13",
    "orig_loc_timestamp": "",
    "canx_type": "AT ORIGIN"
  }
}
```

Message 3 – 0003 – Train Movement

```
{
  "header": {
    "msg_type": "0003",
    "source_dev_id": "VDVF",
    "user_id": "#CF1CV26",
    "original_data_source": "SDR",
    "msg_queue_timestamp": "1263825971000",
    "source_system_id": "TRUST"
  },
  "body": {
    "event_type": "ARRIVAL",
    "gbtt_timestamp": "1167905726000",
    "original_loc_stanox": "",
    "planned_timestamp": "1136369727000",
    "timetable_variation": "0",
    "original_loc_timestamp": "",
    "current_train_id": "",
    "delay_monitoring_point": "true",
    "next_report_run_time": "",
    "reporting_stanox": "42140",
    "actual_timestamp": "1167905725000",
    "correction_ind": "false",
    "event_source": "MANUAL",
    "train_file_address": "7JK",
    "platform": "AA",
    "division_code": "71",
    "train_terminated": "true",
    "train_id": "1214567890",
    "offroute_ind": "false",
    "variation_status": "ON TIME",
    "train_service_code": "22340000",
    "toc_id": "71",
    "loc_stanox": "42140",
    "auto_expected": "true",
    "direction_ind": "",
    "route": "0",
    "planned_event_type": "DESTINATION",
    "next_report_stanox": "",
    "line_ind": ""
  }
}
```

Message 4 – 0004 – Unidentified Train

```
{
  "header": {
```

```
    "msg_type": "0004",
    "source_dev_id": "CCCCDDEE",
    "user_id": "AAAABBCC",
    "original_data_source": "ABCDEFGHIJKLMNOPQNNN",
    "msg_queue_timestamp": "1263825998000",
    "source_system_id": "ABCDEFGHIJKLMNOPQMMM"
  },
  "body": {
    "platform": "12",
    "division_code": "A",
    "loc_stanox": "12345",
    "route": "A",
    "direction_ind": "UP",
    "event_type": "ARRIVAL",
    "line_ind": "F",
    "wtt_id": "1234",
    "event_timestamp": "1172830525000"
  }
}
```

Message 5 – 0005 – Train Reinstatement

```
{
  "header": {
    "msg_type": "0005",
    "source_dev_id": "VDVF",
    "user_id": "#CF1CV26",
    "original_data_source": "SDR",
    "msg_queue_timestamp": "1263826017000",
    "source_system_id": "TRUST"
  },
  "body": {
    "current_train_id": "651F45MN08",
    "original_loc_timestamp": "",
    "train_file_address": "899",
    "train_service_code": "22300003",
    "toc_id": "71",
    "dep_timestamp": "1173192480000",
    "division_code": "66",
    "loc_stanox": "42140",
    "train_id": "1214567890",
    "original_loc_stanox": "",
    "reinstatement_timestamp": "1173197040000"
  }
}
```

Message 6 – 0006 – Train Change of Origin

```
{
  "header": {
    "msg_type": "0006",
    "source_dev_id": "LUAM",
    "user_id": "#CF1CV26",
    "original_data_source": "TRUST DA",
    "msg_queue_timestamp": "1263826048000",
    "source_system_id": "TRUST"
  },
  "body": {
```

```
    "reason_code": "AA",
    "current_train_id": "1294567899",
    "original_loc_timestamp": "1172852700000",
    "train_file_address": "8MV",
    "train_service_code": "22108001",
    "toc_id": "71",
    "dep_timestamp": "1141312680000",
    "coo_timestamp": "1172852700000",
    "division_code": "06",
    "loc_stanox": "65311",
    "train_id": "1214567890",
    "original_loc_stanox": ""
  }
}
```

Message 7 – 0007 – Train Change of Identity

```
{
 "header": {
  "msg_type": "0007",
  "source_dev_id": "CY99996",
  "user_id": "",
  "original_data_source": "TOPS",
  "msg_queue_timestamp": "1263826847000",
  "source_system_id": "TRUST"
 },
 "body": {
  "current_train_id": "422P182Q08",
  "train_file_address": "005",
  "train_service_code": "22320003",
  "revised_train_id": "422X112Q08",
  "train_id": "1214567890",
  "event_timestamp": "1172849234000"
 }
}
```

Message 8 – 0008 – Train Change of Location

```
{
 "header": {
  "msg_type": "0008",
  "source_dev_id": "CCCCDDEE",
  "user_id": "AAAABBCC",
  "original_data_source": "ABCDEFGHIJKLMNOPQNNN",
  "msg_queue_timestamp": "1263826911000",
  "source_system_id": "ABCDEFGHIJKLMNOPQMMM"
 },
 "body": {
  "original_loc_timestamp": "1136369726000",
  "current_train_id": "",
  "train_file_address": "ABC",
  "train_service_code": "ABCDEFGH",
  "dep_timestamp": "1172830526000",
  "loc_stanox": "12345",
  "train_id": "1214567890",
  "original_loc_stanox": "12345",
  "event_timestamp": "1172830525000"
 }
```

}

7.2 Appendix 2 – Sample TD JSON Message

TBC

7.3 Appendix 3 – Sample VSTP JSON Message

```
{
  "VSTPCIFMsgV1": {
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    "timestamp": "1276714566000",
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      "application": "TOPS",
      "component": "VSTP"
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      }
    },
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```

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```

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        }
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        }
       },
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        "CIF_performance_allowance": "",
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        }
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    }
  ]
 }
}
}
}
```

7.4 Appendix 4 – Sample RTPPM JSON Message

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{
 "RTPPMDataMsgV1":{
  "owner":"Network Rail",
  "timestamp":"1329385986000",
  "classification":"public",
  "schemaLocation":"http://xml.networkrail.co.uk/ns/2007/NR rtppm_messaging_v1.17.xsd",
  "Sender":{
   "application":"RTPPM3",
   "organisation":"String"
  },
  "Publication":{
   "TopicID":"RTPPM3/InternalPPM"
  },
  "RTPPMData":{
   "snapshotTStamp":"1329385984000",
   "SystemMsg":null,
   "RAGThresholds":[
    {
     "type":"TOC",
     "medium":"89",
     "good":"92"
    },
    {
     "type":"PPT",
     "medium":"85",
     "good":"91"
    }
   ],
   "WebPPMLink":"http://connect/Performance/PPM/PPMGuide.doc x",
   "PPT":{
    "rag":"A",
    "ragDisplayFlag":"Y",
    "text":"90"
   },
   "NationalPage":{
    "WebDisplayPeriod":"60",
    "WebFixedMsg1":"^<5 mins; *<10 mins",
    "WebFixedMsg2":"The Public Performance Measure shows the performance of trains against the
timetable, measured as the percentage of trains arriving at destination 'on time'. ",
    "WebMsgOfMoment":"GA:- Possession overrun Southend Vic, 1H81 unit poblems Shepreth Branch
Jn...SC:- Points failure Newton Junction...",
    "StaleFlag":"N",
    "NationalPPM":{
     "Total":"4407",
```

```
   "OnTime":"4067",
   "Late":"340",
   "CancelVeryLate":"84",
   "PPM":{
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    "ragDisplayFlag":"Y",
    "text":"92"
   },
   "RollingPPM":{
    "trendInd":"-",
    "rag":"A",
    "text":"91"
   }
  },
  "Sector":[
   {
    "sectorDesc":"London and South East",
    "sectorCode":"LSE",
    "SectorPPM":{
     "Total":"2548",
     "OnTime":"2374",
     "Late":"174",
     "CancelVeryLate":"45",
     "PPM":{
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      "text":"93"
     },
     "RollingPPM":{
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      "rag":"G",
      "text":"92"
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    }
   },
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    "sectorCode":"LD",
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     "CancelVeryLate":"2",
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      "text":"97"
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     "RollingPPM":{
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      "rag":"G",
      "text":"97"
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   },
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    "sectorDesc":"Regional",
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```

```
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         "CancelVeryLate":"30",
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           "text":"92"
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     },
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       "sectorDesc":"Scotland",
       "sectorCode":"SCO",
       "SectorPPM":{
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         "OnTime":"367",
         "Late":"65",
         "CancelVeryLate":"7",
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           "text":"84"
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         "RollingPPM":{
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           "rag":"R",
           "text":"82"
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       }
     }
   ],
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       "keySymbol":"*",
       "name":"CrossCountry",
       "Total":"45",
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         "text":"100"
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   "timeband":"5",
   "sectorCode":"REG",
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                "PPM":{
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            "text":"76"
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        "CancelVeryLate":"3",
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  },
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     "text":"80"
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    "sectorCode":"REG",
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    "OnTime":"92",
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    "CancelVeryLate":"0",
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    "text":"91"
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  "timeband":"5",
  "sectorCode":"LSE",
  "Total":"156",
  "OnTime":"142",
  "Late":"14",
  "CancelVeryLate":"11",
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   "text":"91"
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  "RollingPPM":{
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   "displayFlag":"Y",
   "rag":"R",
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  "name":"Kent Link Peak",
  "timeband":"5",
  "sectorCode":"LSE",
  "Total":"131",
  "OnTime":"122",
  "Late":"9",
  "CancelVeryLate":"4",
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  "RollingPPM":{
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  }
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        "name":"South Eastern Staff Trains",
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        "OnTime":"1",
        "Late":"0",
        "CancelVeryLate":"0",
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          "text":"-1"
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        "RollingPPM":{
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    "CancelVeryLate":"1",
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    "displayFlag":"Y",
    "rag":"G",
    "text":"96"
   }
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   "Total":"29",
   "OnTime":"25",
   "Late":"4",
   "CancelVeryLate":"0",
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    "text":"86"
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   "RollingPPM":{
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    "displayFlag":"Y",
    "rag":"A",
    "text":"90"
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    "text":"100"
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   "timeband":"5",
   "sectorCode":"LSE",
   "Total":"58",
   "OnTime":"52",
   "Late":"6",
   "CancelVeryLate":"0",
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     "displayFlag":"Y",
     "rag":"G",
     "text":"94"
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        },
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          "sectorCode":"LD",
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          "OnTime":"9",
          "Late":"1",
          "CancelVeryLate":"1",
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            "text":"90"
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            "displayFlag":"Y",
            "rag":"G",
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          }
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      "CancelVeryLate":"1",
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        "text":"92"
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        "displayFlag":"Y",
        "rag":"G",
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      }
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      "name":"Outer Thames Valley - London",
      "timeband":"5",
      "sectorCode":"LSE",
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      "CancelVeryLate":"0",
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        "text":"92"
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        "displayFlag":"Y",
        "rag":"R",
        "text":"83"
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      "sectorCode":"REG",
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      "displayFlag":"Y",
      "rag":"G",
      "text":"100"
    }
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  {
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    "timeband":"5",
    "sectorCode":"REG",
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    "OnTime":"13",
    "Late":"2",
    "CancelVeryLate":"0",
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      "text":"86"
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      "displayFlag":"Y",
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      "text":"77"
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    "sectorCode":"LSE",
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  }
  ]
},
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   "text":"95"
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  "text":"85"
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        }
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  {
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    "CancelVeryLate":"0"
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       "rag":"G",
       "text":"100"
      },
      "RollingPPM":{
       "trendInd":"=",
       "displayFlag":"Y",
       "rag":"G",
       "text":"100"
      }
     },
     {
      "name":"North Trans Peninne",
      "timeband":"10",
      "sectorCode":"LD",
      "Total":"23",
      "OnTime":"23",
      "Late":"0",
      "CancelVeryLate":"0",
      "PPM":{
       "rag":"G",
       "text":"100"
      },
      "RollingPPM":{
       "trendInd":"=",
       "displayFlag":"Y",
       "rag":"G",
       "text":"100"
      }
     },
     {
      "name":"North West",
      "timeband":"10",
      "sectorCode":"LD",
      "Total":"14",
      "OnTime":"14",
      "Late":"0",
      "CancelVeryLate":"0",
      "PPM":{
       "rag":"G",
       "text":"100"
      },
      "RollingPPM":{
       "trendInd":"=",
       "displayFlag":"Y",
       "rag":"G",
       "text":"100"
      }
     },
     {
      "name":"Preston - Scotland",
      "timeband":"10",
```

```
            "sectorCode":"LD",
            "Total":"1",
            "OnTime":"1",
            "Late":"0",
            "CancelVeryLate":"0",
            "PPM":{
              "rag":"W",
              "text":"-1"
            },
            "RollingPPM":{
              "displayFlag":"Y",
              "rag":"W",
              "text":"-1"
            }
          },
          {
            "name":"South Trans Pennine",
            "timeband":"10",
            "sectorCode":"LD",
            "Total":"7",
            "OnTime":"7",
            "Late":"0",
            "CancelVeryLate":"0",
            "PPM":{
              "rag":"G",
              "text":"100"
            },
            "RollingPPM":{
              "trendInd":"=",
              "displayFlag":"Y",
              "rag":"G",
              "text":"100"
            }
          }
        ]
      }
    ]
  }
}
}
```

7.5 Appendix 5 – Sample TSR JSON Message

TBC