

# HP Real Time Information Director for the Real Time Supply Chain Solution

Technical overview paper



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## Executive summary

The HP Real Time Information Director (RTID) is a component of the HP Real Time Supply Chain (RTSC) Solution Foundation Layer, which maps between the message format used by a source system, such as SAP, and the RTSC Data Store.

## Major functions

RTID Component provides several major functions. It

- Provides mapping between the message format used by the source system and the RTSC Data Store
- Provides mapping from the RTSC Data Store to the format required by subscribing applications
- Allows enterprise applications to submit events and other data to the RTSC Data Store
- Allows enterprise applications to subscribe to events in the RTSC Data Store

Additionally, the RTID provides facilities for de-duplication and cleansing services. Often data from different applications or different sources refer to the same entity (for example, customer address) but look somewhat different or have bad elements such as zip code. De-duplication and cleansing maintains a single view of such data, in a form that is corrected and cleaned up.

## Message disassembly and assembly

One of the most important functions of the RTID Component is to map between the message format used by a source system—for example, SAP—and the RTSC Data Store. The modules that perform this mapping are

- **The Message Disassembler**, which maps segments and fields in an incoming XML message to records and columns in the RTSC Data Store. The Loader Module, described later in this document, uses the Message Disassembler to insert incoming data into the RTSC Data Store.
- **The Message Assembler**, which maps records and columns in the RTSC Data Store to segments and fields of an outgoing XML message. The Subscription Module, described later in this document, uses the Message Assembler to format data for subscribing applications.

The XML message can be an SAP IDoc, but it need not be.

## Forms of metadata

A solution designer uses a text editor or Java Integrated Development Environment (IDE) to specify two kinds of metadata for the Message Disassembler and Message Assembler to use: format metadata and content metadata.

Format and content metadata have the same “look and feel.” Each metadata item is expressed as a Java constructor with the set of parameters that a specific constructor requires. The metadata literally consists of new statements nested in brackets and braces to match the hierarchy of the data in a message.

### Format metadata

Format metadata specifies, for each XML tag in an IDoc, the column in the RTSC Data Store where the data will be stored. Just as the XML document can contain nested segments (each containing one or more fields, or elements), the metadata language provides for many levels of nesting. The metadata language also supports “flattening” incoming data to store fields from multiple segments in the same database record.

## Content metadata

Content metadata is used to create and execute prepared SQL statements that delete old records and insert new ones related to an IDoc or other XML message. The metadata describes relationships among tables and associations among records in multiple tables. In the case of an incoming message that is not an IDoc, the metadata is also used to map the incoming data to records and columns in the RTSC Data Store.

## Loader Module

The Loader Module is the RTID Component that allows enterprise applications to submit events and other data to the RTSC Data Store. Any enterprise application, such as SAP or other common supply chain application, can submit events or data, provided that it can post XML messages to the Java Message Service (JMS), either directly or through an enterprise application integration (EAI) service.

Like other components of the RTID, the Loader Module runs in a BEA WebLogic Server environment on the HP NonStop server platform. The module consists of a set of Enterprise JavaBeans (EJB) or Message-Driven Beans (MDB).

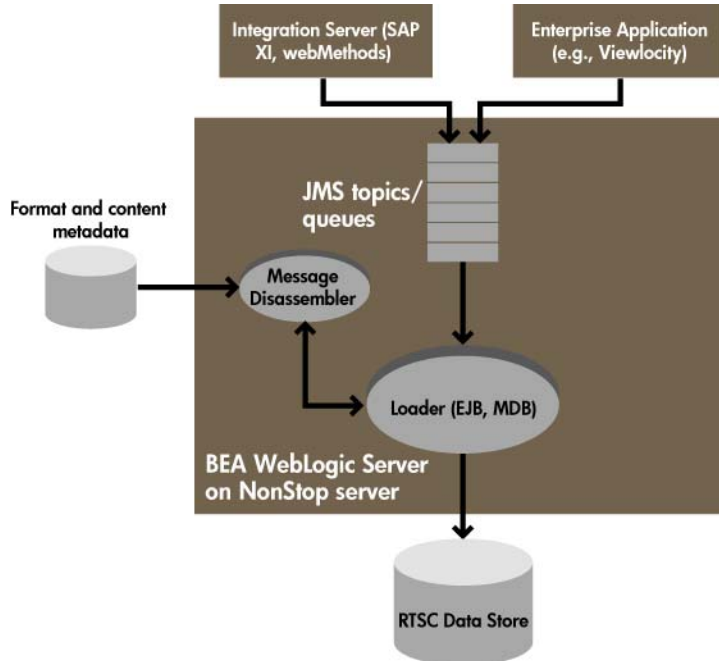
Figure 1 represents the architecture of the Loader Module.

The Loader Module is a set of beans that provide access to the RTSC Data Store, the Message Disassembler, and optionally to message de-duplication and cleansing services.

When the RTID Application starts up, a Loader (which, remember, is not a process but a set of beans in WebLogic Server running on a NonStop server) is activated in each instance of WebLogic Server on the NonStop server. Thus, the Loader Module inherits the scalability of WebLogic Server on the NonStop server.

The Loader Module retrieves messages from the JMS queue. For each message, it requests an instance of the Message Disassembler that is appropriate to the incoming IDoc or message type. The Message Disassembler uses the metadata—either the format and content metadata for an incoming IDoc, or just the content metadata for some other type of message—to set parameters in the appropriate prepared SQL statement. The Loader Module inserts the data into the RTSC Data Store by executing the prepared statement built by the Message Disassembler. Database inserts occur in the context of a transaction.

Figure 1. Loader Module architecture.



The Loader Module can perform either of two types of insertions:

- *Deletes*. In this process, all records related to an IDoc or other document are deleted and replaced by data from the incoming document.
- *Upserts*. In this process, existing records related to an IDoc or other documents are not deleted, but data from the incoming document replaces the corresponding data in existing records.

The Loader Module can also insert history records, allowing users to accumulate a history of changes in a given record.

Users specify the type of insertion to be made when the RTID metadata is created.

## Subscription Module

The Subscription Module is used to deliver documents to applications that subscribe to events in the RTSC Data Store. The Subscription Module supports any document format defined in the metadata. A subscription specifies which of the available document formats must be delivered to the subscribing application when the subscription is triggered. The Subscription Module uses the Message Assembler to construct the required message. The RTSC Toolkit includes a set of predefined (“canned”) subscriptions that can be extended to satisfy application needs.

Like other components of the RTID, the Subscription Module runs in a WebLogic Server environment on the NonStop server.

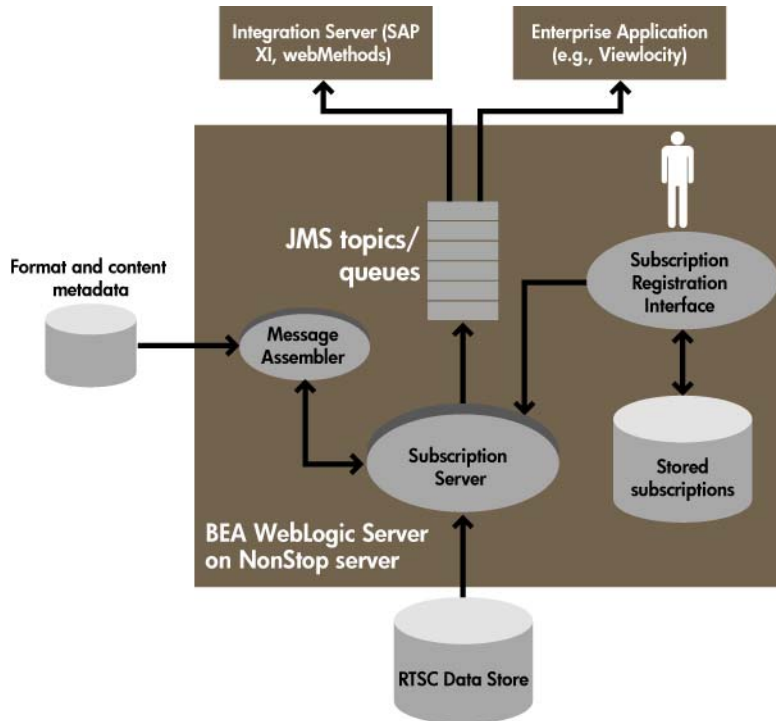
The Subscription Module includes

- An interface for registering and managing subscriptions

- A component that recognizes subscribed events and notifies subscribers with appropriate messages

Figure 2 represents the architecture of the Subscription Module.

**Figure 2.** Subscription Module architecture



## Subscription Registration Interface

A user (shown in the upper right corner of figure 2) uses the Subscription Registration Interface to specify a subscription. A subscription has three attributes:

- A SQL Select statement, which defines the event in the RTSC Data Store that will trigger the subscription.
- A JMS topic or queue name. This name indicates where the subscription server must publish the message. The configuration of the Integration Server or Enterprise Application must specify a matching topic or queue name.
- The name of the document to be delivered when the data store event occurs.

The Subscription Registration Interface provides ways to browse among registered subscriptions, delete a subscription, or reinstate a previously defined subscription.

All registered subscriptions are stored in a Subscriptions Store—a NonStop SQL table where each row in the table corresponds to a subscription that has been registered with the Subscription Server.

## Subscription Server

A Subscription Server (SubServ) is the component of the RTID that services a subscription.

When the RTID Application starts up, a Subscription Server instance (which is a startup class in WebLogic Server on a NonStop server) is activated for each registered subscription. Thereafter, whenever a new subscription is registered, a Subscription Server instance is activated to service the subscription. When an existing subscription is deleted, the corresponding Subscription Server instances are deactivated.

When a subscribed event occurs, as defined by the SQL statement in the subscription, the Subscription Server receives from HP NonStop SQL/MX Software all the database columns required to build the message to the subscriber.

For this function to work, all the data required by the outgoing message must be in the RTSC Data Store, although not necessarily in the inserted record that triggered the subscription. For example, if an incoming order from a customer triggers an outgoing request to restock a shelf, some of the information required for the restocking request will be pulled from elsewhere in the RTSC Data Store. The person who tailors the data model to the environment must ensure that all fields required to construct outgoing messages to subscribers—for example, every required field of every requested IDoc—are present in the RTSC Data Store.

The Subscription Server assembles the message using the Message Assembler to read mapping metadata (“Format and content metadata” in figures 1 and 2). This metadata is shared by the various components of the RTID; for example, the Loader Module uses the same metadata to disassemble messages received from Enterprise Applications.

The Subscription Server posts the outgoing message to the JMS topic or queue specified in the subscription.

The Subscription Server has additional features that provide the ability to

- Enable previously configured subscriptions when the application restarts
- Resume subscriptions automatically after a failure
- Accommodate increases and decreases in load for optimal use of system resources
- Deliver messages even under peak conditions

## Summary

An enterprise’s supply chain is recognized as a significant lever that can be used to improve profitability, increase customer satisfaction, and reinvigorate the enterprise. Modern supply chain operations call for improvements in access to data across the enterprise, removing old silos, and providing a customer view of data (as opposed to a functional or departmental view). In addition, shifting the enterprise to living and working in real time brings a new vitality to an old core function of an enterprise, its supply chain.

Imagine if all inventory planners could have up-to-the-minute information about product levels, if shipping coordinators could know exactly what was delivered and what is in process, and if demand forecasters could know what has been sold and what is required for the next period.

Sometimes getting to real time means having certain information tuned to a-couple-seconds responsiveness and other information tuned to “within-a-week” responsiveness. The main point is that the RTSC Solution is designed to deliver the kind of information responsiveness that the advanced enterprise needs to make its supply chain effective as a key component of the business’ mission. Supply chain is *mission critical* in today’s competitive world.

## For more information

For more information about the RTID Component and the RTSC Solution, visit [www.hp.com/go/rtsc](http://www.hp.com/go/rtsc).

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