

HP Universal CMDB

for the Windows and Solaris operating systems

HP Universal CMDB–Microsoft Systems Management Server (SMS) Integration Guide

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Microsoft Systems Management Server Integration with HP Universal CMDB

This document includes the main concepts, tasks, and reference information for integration of Microsoft Systems Management Server (SMS) with HP Universal CMDB (UCMDB).

This chapter includes:

Concepts

- ▶ SMS Integration – Overview on page 8
- ▶ SmsDbAdapter Database Adapter on page 8

Tasks

- ▶ Configure SMS – UCMDB Integration on page 9
- ▶ Update the Integration Data Model in UCMDB on page 14

Reference

- ▶ Modeling on page 16
- ▶ SMS Integration Package on page 17
- ▶ SMS Adapter Configuration Files on page 22

Troubleshooting and Limitations on page 23

SMS Integration – Overview

Microsoft Systems Management Server is used by IT administrators to manage client computers and servers.

SMS enables you to:

- ▶ manage computers that roam from one location to another
- ▶ track deployment and use of software assets, and use this information to plan software procurement and licensing
- ▶ provide IT administrators and management with access to data accumulated by SMS
- ▶ provide scalable hardware and software management
- ▶ manage security on computers running Windows operating systems, with a minimal level of administrative overhead

This section also includes:

- ▶ "Supported Versions" on page 8

Supported Versions

SMS integration has been developed and tested on HP Universal CMDB version 8.03 or later with SMS version 2003 or later.

SmsDbAdapter Database Adapter

The **SmsDBAdapter** (SMS Adapter) database adapter is based on the Generic Database Adapter. This adapter supports both full and differential replication of all source CIs that are defined in the **SmsDBAdapter** package, as well as the Service Manager integration flow. For details, see "SMS Integration Package" on page 17.

The SMS Adapter is a collection of resources (jar files and configuration files) that are deployed to a UCMDDB server in a specific location.

The SMS Adapter supports the following SMS features:

- Identifying changes that have occurred in SMS, to update the replicated CI database.

- Simulating the touch mechanism capabilities:

When a CI is removed from SMS, it is physically deleted from the database and there is no way to report about it. The SMS adapter supports a full synchronization interval. This means that the adapter transfers data for which the aging mechanism has been enabled, and provides the time interval to run a full synchronization that simulates the touch mechanism.

For query details, see "SMS Adapter Configuration Files" on page 22.

Configure SMS – UCMDB Integration

This task describes how to install and use the SMS DB Adapter, and includes the following steps:

- "Deploy the SmsDBAdapter Package" on page 9
- "Change Root CITs in the CI Type Selector" on page 10
- "Define the Source Adapter" on page 10
- "Define the Target Adapter" on page 12
- "Define the Replication Jobs" on page 12
- "Run the replication jobs" on page 14

1 Deploy the SmsDBAdapter Package

The **SmsDBAdapter.zip** package is located on the file system in:
<HP Universal CMDB root directory>\UCMDB\UCMDBServer\root\lib\
integration_packages.

Deploying this package provides you with the SMS DB Adapter necessary to run the integration.

2 Change Root CITs in the CI Type Selector

The CITs added by deploying the **SmsDBAdapter** package are not automatically visible under the IT Universe node of the CI Type Selector. To view these CI Types in the tree, and to be able to edit or create new TQL queries with the proper links, do the following:

- a Navigate to **Settings > Infrastructure Settings Manager**.
- b Select **Settings** and then select **UCMDB common**.
- c Change **Link Root** to **link**.
- d Change **Object Root** to **data**.
- e Log out of UCMDB and then log in again.

3 Define the Source Adapter



- a Navigate to **Settings > Federated CMDB**.
- b Click the **New Data Store** button to open the New Data Store Dialog Box. For details, see "New Data Store Wizard" in *Integrations*.
- c Enter the following information:

Name	Recommended Value	Description
Adapter	SmsDBAdapter	The name of the adapter that will be used to retrieve the external data from the SMS database.
Name	<user defined>	The name of the data store.
Host	<user defined>	The host name of the machine where MSSQL with the SMS database is running.
Port	1433	The port through which you access the MSSQL database.
User	<user defined>	The user name needed to access the MSSQL database.

Name	Recommended Value	Description
Password	<user defined>	The password needed to access the MSSQL database.
URL	dbtype=<user defined>; dbname=<user defined>	A semicolon-separated list of parameters passed to the adapter. Specify the following parameters: <ul style="list-style-type: none"> ▶ dbtype – the type of database, usually sqlserver ▶ dbname – the name of the SMS database

- d** On the Supported CI Types tab, select the CIs that should be retrieved from the SMS database when any TQL is calculated, that is, which CIs and attributes are federated. If you deselect all CIs, none of the data is federated. If you select only certain CIs, only the selected CIs are federated.

Note:

- ▶ The host, IP and Interface should not be selected for federation, since this data should be replicated to the UCMDB.
- ▶ Other CIs can be used in federation only after the host data has been replicated to CMDB by the hostData TQL query. This is because the default reconciliation rule uses the **SM_Host.device_id** attribute to identify the hosts.
- ▶ You cannot choose the Memory CIT for federation when performing integration with Service Manager. This is because federated CIs cannot be replicated, and Memory is one of the CIs that is replicated to Service Manager.

-
- e** On the Supported Queries tab, select the **hostData** integration TQL query.

- f** Click **Save** to save the data store.



For additional details on defining adapters, see "New Data Store Wizard" in *Integrations*.

4 Define the Target Adapter

- a Navigate to **Settings > Federated CMDB**.
- b Click the **New Data Store** button to open the New Data Store Dialog Box. Enter the following information:



Name	Recommended Value	Description
Adapter	<user defined>	The name of the adapter that is used to retrieve the external data from the SMS database. Use either CmdbRmiAdapter or CmdbSoapAdapter.
Name	<user defined>	The name of the data store.
CustomerID	1	The customer ID for HP Universal CMDB.
Host	<user defined>	The host name of the machine where the Universal CMDB is running.

5 Define the Replication Jobs

Define one or more replication jobs that use the source adapter you defined in step 3 and the target adapter you defined in step 4. For details, see "Replication Jobs Tab" in *Integrations*. Make sure you select the integration TQL that is to be used for replication.

Data removal issue

The SMS adapter cannot supply information about removed CIs, since the Microsoft SMS database does not contain this information. The integration uses the replication mechanism to simulate the touch mechanism. This behavior is achieved by performing a one-time full synchronization from SMS to UCMDB.

The SMS adapter provides a mechanism that enables you to set a time frame during which to run the synchronization (the default time frame is one week). This mechanism works with a scheduled replication job to run a full replication only (not a differential replication) according to the time frame value you set.

To change the time frame, update the **adapter.xml** file in the **SmsDBAdapter.zip** package, and change the value of the full-sync-interval element (the value is in days, and can be doubled), and then redeploy the **SmsDBAdapter.zip** package.

Notes:

- This integration assumes that the aging mechanism in CMDB is active.
 - If no replication with SMS has been defined, the data that has been replicated from SMS is removed from the CMDB, since the touch mechanism recognizes that no changes have been made.
 - Since the deletion of CIs is performed by the aging mechanism, the **Permit Deletion in Target** check box is irrelevant. CIs are always deleted if not touched by the aging mechanism.
-

6 Run the replication jobs

Activate the replication jobs in one of the following ways:



- ▶ To immediately run a full replication, click the **Ad Hoc Full Replication** button. In a full replication, all appropriate data in the source is brought to the target, without taking the last run of the replication job into consideration.



- ▶ To immediately run a differential replication, click the **Ad Hoc Diff Replication** button. In a differential replication, the previous replication time stamp is sent to DDMi, and DDMi returns changes from that time stamp to the present. These changes are then entered into the UCMDb database.
- ▶ To schedule a differential replication to run at a later time or periodically, define a scheduled task. For details, see "Define Tasks that Are Activated on a Periodic Basis" in *Model Management*.

Note that the replicated CIs are controlled by the integration TQL that is used. You can create additional TQL queries that contain different topologies for use in other jobs.



Update the Integration Data Model in UCMDb

Out-of-the-box CIs for SMS integration can be extended in one of the following ways:

To add an attribute to an existing CI type:

- 1 In the file system, navigate to: <HP Universal CMDB root directory>\UCMDb\UCMDbServer\j2f\FCMDb\CodeBase\SmsDBAdapter\META-INF\orm.xml.
- 2 Locate the **generic_db_adapter.[CI type]** that was changed, and add the new attribute.

For details on adding attributes, see "Add/Edit Attribute Dialog Box" in *Model Management*.

3 Reload the adapter by performing one of the following actions:

- Navigate to: **http://[uCMDB server]:8080/jmx-console/HtmlAdaptor?action=inspectMBean&name=Topaz%3AService%3DFCmdb+Config+Services.**
- Select **loadOrReloadCodeBaseForAdapterId**. Set the customer ID to 1 and the adapter ID to **SmsDBAdapter**.

or

- Click the **Reload** button.

4 Ensure that the TQL queries that include this CIT have the new attribute in their layouts.

- a In the Query Manager, right-click the node where you want to include the attribute.
- b Select **Node/Relationship Properties**.
- c Click **Advanced layout settings** and select the new attribute.

For details about selecting attributes, see "Layout Settings Dialog Box" in *Model Management*. For limitations on creating this TQL query, see "Troubleshooting and Limitations" on page 23.

To add a new CI Type to the Generic DB Adapter:

1 In UCMDB, create the CI Type that you want to add to the adapter, if it does not already exist. For details, see "Create a CI Type" in *Model Management*.

2 In the file system navigate to: <HP Universal CMDB root directory>\UCMDB\UCMDBServer\j2f\FCMDB\CodeBase\SmsDBAdapter\META-INF\orm.xml.

3 Map the new CI type by adding a new entity called **generic_db_adapter.[CI type]**.

4 Reload the adapter by performing one of the following actions:

- Navigate to: **http://[uCMDB server]:8080/jmx-console/HtmlAdaptor?action=inspectMBean&name=Topaz%3AService%3DFCmdb+Config+Services.**

- ▶ Select **loadOrReloadCodeBaseForAdapterId**. Set the customer ID to **1** and the adapter ID to **EDDBAdapter**.

or

- ▶ Click the **Reload** button.



- 5** Create queries to support the new CITs that you have added. Make sure that all mapped attributes are selected in the Advanced Layout settings:
 - a** In the Query Manager, right-click the node where you want to include the attribute.
 - b** Select **Node/Relationship Properties**.
 - c** Click **Advanced layout settings** and select the new attribute.

For details about selecting attributes, see "Layout Settings Dialog Box" in *Model Management*. For limitations on creating this TQL query, see "Troubleshooting and Limitations" on page 23.

- 6** In UCMDb, navigate to **Settings > Federated CMDB**.
- 7** Edit the SmsDBAdapter data store to support the updated TQL queries.
- 8** Edit the replication job that you created in step 5 on page 12 to include the new TQL query.

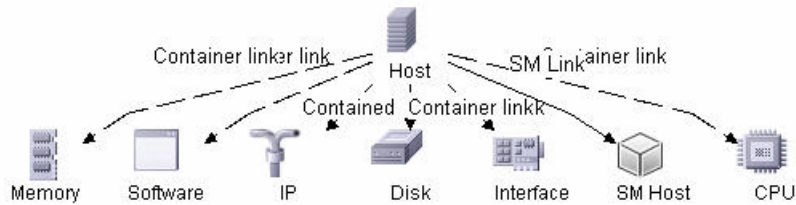
Modeling

Entities managed by SMS fall into one of three categories:

- ▶ hosts and their hardware inventory
- ▶ software and services
- ▶ networking information

All of this information is already represented in the current UCMDb class model, so standard CI types are used for mapping. No new attributes are added to existing CITs. The SM_HOST CI type supports the SM integration flow, providing the additional data on the host. It is also used for reconciliation of hosts.

The SMS topology is represented in the following view:



Note: The SMS adapter can discover software either by hardware inventory or by software inventory. By default, the software CI is mapped for software discovery. If you want to map the hardware CI, edit the **orm.xml** file to comment the **software** and **host_container_f_software** entities definition that use the **v_GS_SoftwareProduct** view, and uncomment the **software** and **host_container_f_software** entities definition that use the **v_GS_Mapped_Add_Remove_Programs** view.

SMS Integration Package

The SMS integration package, **SmsDBAdapter.zip**, is provided during UCMDB installation. Use the Package Manager to deploy this package to UCMDB.

The **SmsDBAdapter.zip** package contains the following resources:

- ▶ **adapter.xml** file – the XML file that describes the capabilities of the SMS adapter. Deploying the **SmsDBAdapter.zip** package makes the **SmsDBAdapter** file available in UCMDB as a data store provider.
- ▶ **adapterCode** folder – the SMS adapter implementation including configuration files.

This section also includes:

- "Transformations" on page 18
- "Integration TQL" on page 20
- "SMS Plug-in" on page 21
- "Reconciliation" on page 22

Transformations

Following is the list of transformations that are applied to values when they are transferred to or from the SMS database:

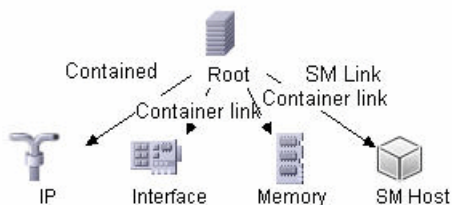
ClassClass	Attribute	Transformation
nt	nt_servicepack	Represents number of the Windows service pack. SMS DB: Service Pack 2 UCMDB: 2.0 Transformer: standard GenericEnumTransformer, mapped in the nt.nt_servicepack.transformer.xml file.
host	host_isdesktop	A Boolean value that determines whether a machine is a desktop or a server. SMS DB: Workstation or Server UCMDB: true or false Transformer: standard GenericEnumTransformer, mapped in the host.host_isdesktop.transformer.xml file.

ClassClass	Attribute	Transformation
host	host_os	<p>Represents the host Operation name.</p> <p>SMS DB: "Microsoft Windows XP Professional"</p> <p>UCMDB: "Windows XP"</p> <p>Transformer: standard GenericEnumTransformer, mapped in the host.host_os.transformer.xml file.</p> <p>If the SMS operation system value is not listed in the transformer.xml file, the original value is sent to UCMDB.</p> <p>By default, only Windows operating systems are mapped.</p>
host	host_osinstalltype	<p>Represents the Windows OS edition.</p> <p>SMS DB: "Microsoft Windows XP Professional"</p> <p>UCMDB: "Professional"</p> <p>Transformer: standard GenericEnumTransformer, mapped in the host.host_osinstalltype.transformer.xml file.</p> <p>Note: The same column in the SMS database is mapped to two different UCMDB attributes, using different transformers.</p>

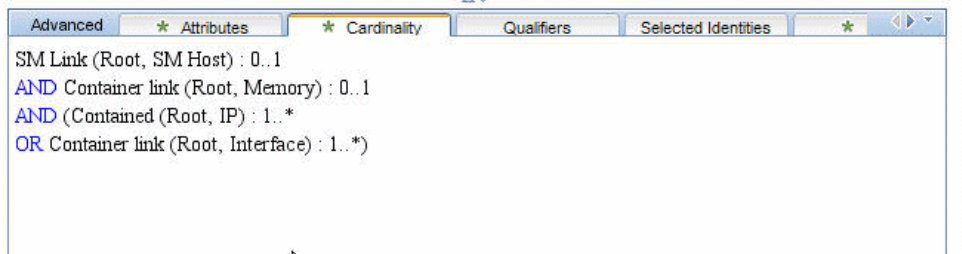
ClassClass	Attribute	Transformation
disk	data_name	Represents the partition name. SMS DB: C: UCMDB: C Transformer: standard AdapterToCmdbRemoveSuffixTransformer, which removes the colon.
interface	interface_macaddr	Represents the MAC address of NIC. SMS DB: AB:CD:EF:01:23:45 UCMDB: ABCDEF012345 Transformer: custom SmsMacAddressTransformer, which removes the colons from the SMS MAC address while making it compatible with UCMDB MAC addresses.

Integration TQL

Below is the hostData integration TQL that is used for replication:



Host Cardinalities



All other entities use the “1..*” cardinality, meaning that there should be at least one host linked.

SMS Plug-in

The `SmsReplicationPlugin` class, found in the `smsPlugins.jar` file, provides enhanced functions to those found in the Generic Database Adapter. It is called when:

- ▶ full topology is requested (**getFullTopology**) – this returns all the CIs that were found in the external SMS database.
- ▶ topology layout is requested (**getLayout**)
- ▶ topology of changes is requested (**getChangesTopology**) – this returns only the CIs that were modified or added after a specific time. The topology of the changes is calculated as follows:
 - ▶ There is a specific date (**fromDate**) after which all changes are requested.
 - ▶ Most of the entities in the SMS database contain a Timestamp column that contains the date and time of the last modification. This Timestamp column is mapped to the **root_updatetime** attribute of a CI. Currently, some entities do not contain any creation time information. The entities that have a timestamp column must be listed in the **replication_config.txt** file.
 - ▶ In the integration TQL query, the Host CI is named **Root**.

- ▶ Using the plug-in, the integration TQL query is dynamically modified so that each **Root** entity and all entities that are listed in the **replication_config.txt** file have an additional condition causing the value of the **root_updatetime** attribute to be greater than or equal to the **fromDate** value.
- ▶ This modified TQL query is then used to obtain the data.

Reconciliation

Reconciliation rules are defined in **reconciliation_rules.txt** file. The reconciliation is done by the **sm_host.device_id** attribute, which is brought to UCMDB by replication.

SMS Adapter Configuration Files

The adapter includes the following configuration files that were changed from or added to the default Generic DB Adapter files:

- ▶ **adapter.xml**. Contains general adapter configuration.
- ▶ **orm.xml**. The OR mapping file, which maps between SMS database tables and columns, and UCMDB classes and attributes. Both CIs and links are mapped.
- ▶ **fixed_values.txt**. Used by the Generic DB Adapter to set the **ip_domain** of IP CIs to **DefaultDomain**.
- ▶ **plugins.txt**. Contains configuration information for the Generic DB Adapter. Also defines three plug-ins that are used during replication: **getFullTopology**, **getChangesTopology**, and **getLayout**.
- ▶ **reconciliation_rules.txt**. Contains the rules for data reconciliation. Hosts reconciliation is decided by comparing the **sm_host.device_id** attribute.
- ▶ **transformations.txt**. Contains the configuration for transformation of attribute values. For a list of the transformations, see “Transformations” on page 18.
- ▶ **host.host_isdesktop.transformer.xml**. Mapping used by the transformer for the **host_isdesktop** attribute.

- **host.host_os.transformer.xml**. Mapping used by the transformer for the **host_os** attribute.
- **host.host_osinstalltype.transformer.xml**. Mapping used by the transformer for the **host_osinstalltype** attribute.
- **nt.nt_servicepack.transformer.xml**. Mapping used by the transformer for the **nt_servicepack** attribute.
- **sms_plugins.jar**. Contains the plug-in and MAC address transformer classes.
- **replication_config.txt**. Contains a comma-separated list of non-root CIs and relations types that have a **timestamp** condition in the SMS database. This status condition indicates the last time the entity was updated.

For details on adapter configuration, see "The Generic Database Adapter" in *Integrations*.

Troubleshooting and Limitations

- A query should contain one CI that is labeled Root.

The root node is the main CI that is synchronized; the other nodes are the contained CIs of the main CI. For example, when synchronizing hosts, the host node is labeled as root and the host resources are not root.
- The TQL graph must not have cycles.
- The adapter does not support compound relations.
- Entities that are added in SMS are sent as updates to UCMDB by the SMS Adapter during differential replication.
- ID conditions on the integration TQL query are not supported.

