Operations Manager i

RTSM Best Practices

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Enterprise

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Contents

Chapter 1: Introduction

See the following sections for an introduction to the RTSM Best Practices:

- "The role of the Operations Bridge RTSM" below

- "The role of an APM RTSM" on the next page

- "The role of an APM RTSM" on the next page

The role of the Operations Bridge RTSM

OMi is the event management foundation for a complete Business Service Management (BSM) solution. As the Operations Bridge, it consolidates all IT infrastructure monitoring in a central event console, and relates the events to the IT services that depend on that infrastructure.

The monitored IT services and IT applications and infrastructure are represented as Configuration Items (CIs) in OMi's Run-time service model (RTSM). The OMi RTSM represents the monitored IT environment, to help Operations Bridge users to understand the relationships between components, and to process reported events efficiently. This topology - the CIs and relationships - in OMi's RTSM is further used to correlate events by OMi's topology-based event correlation and is also the basis for various other OMi capabilities (monitoring automation, service health, downtime management, and so on).

The topology in OMi's RTSM is typically created by Operations Agents, Management Pack discovery, SiteScope, BSM Connectors, vPV and NNMi.
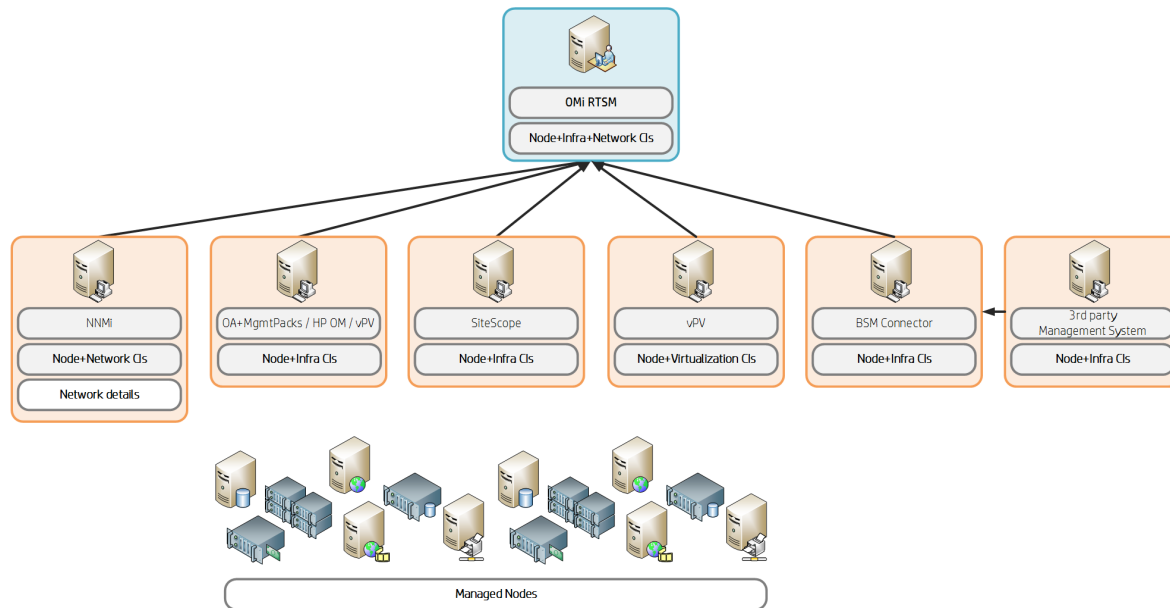
Topology can also be created by integrating Universal Discovery, Application Performance Management topology or other sources directly into OMi. In a hierarchical deployment, an OMi RTSM can also contain CIs from other OMi RTSM systems.

The role of an APM RTSM

A BSM 9.x system used for Application Performance Management (using one or multiple products such as BPM, RUM, SiteScope, Transaction Vision or Diagnostics) focuses on the Application Health and Performance.

The monitored applications and their IT infrastructure are represented as Configuration Items (CIs) in the APM Run-time service model (RTSM). The APM RTSM represents the IT environment under monitoring by APM, to help APM users to understand the relationships between applications, transactions and underlying IT infrastructure, and to analyze application performance problems efficiently. This topology - the CIs and relationships - in APM's RTSM is further used to analyze performance behavior (by SHA) and is also the basis for APM capabilities such as SLM, downtime management and service health.

The topology in the APM RTSM is typically created by data providers such as RUM, SiteScope and Diagnostics, or manually created as part of the BPM configuration. Topology can also be created by integrating Universal Discovery, NNMi topology or other sources directly into the APM RTSM.
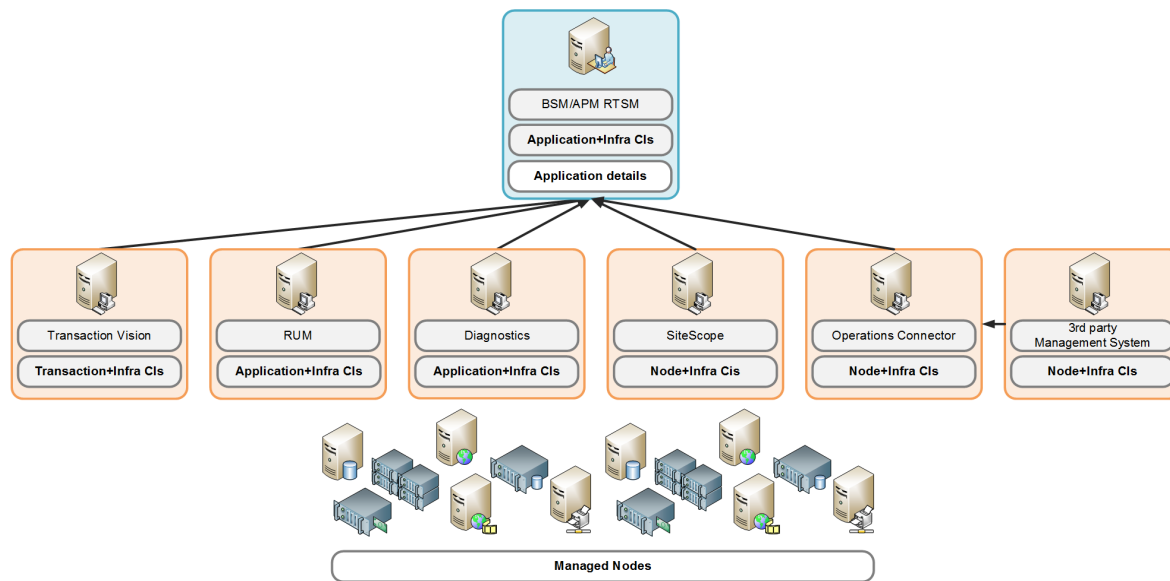
Integrating OMi and APM RTSMs and other CMDBs

In a complete Business Service Management (BSM) solution, it makes sense to integrate Operations Bridge and Application Performance Management functions by integrating the APM and OMi RTSM systems. There might be also other CMDBs or CMDB-like systems that contain CIs that should be integrated into the BSM solution.

The following sections explain the best practices for integrating the OMi RTSM and the APM RTSM with each other and with other CMDBs.

Chapter 2: Architecture Best Practices

See the following sections for information on how to best design your architecture:

BSM architecture with a separate UCMDB / CMS

Although both OMi and APM RTSM are based on UCMDB technology, many IT organizations turn to a separate UCMDB to create a shared single version of truth to support not only business service management, but also configuration management, IT service management, change management, and asset management initiatives.

A separate UCMDB logically is the central element of a Configuration Management System (CMS). It provides more features to support the various initiatives (like configuration policy management, change tracking and control and so on) and is able to manage more configuration items than an RTSM system. HPE CMS offers many integrations with other HPE or 3rd party products.

A Business Service Management solution can integrate with such an external UCMDB used as CMS to support the other initiatives.

In such an environment relevant CIs from the BSM solution can be synchronized to the CMS system and relevant CIs from the CMS can be synchronized to the BSM solution.
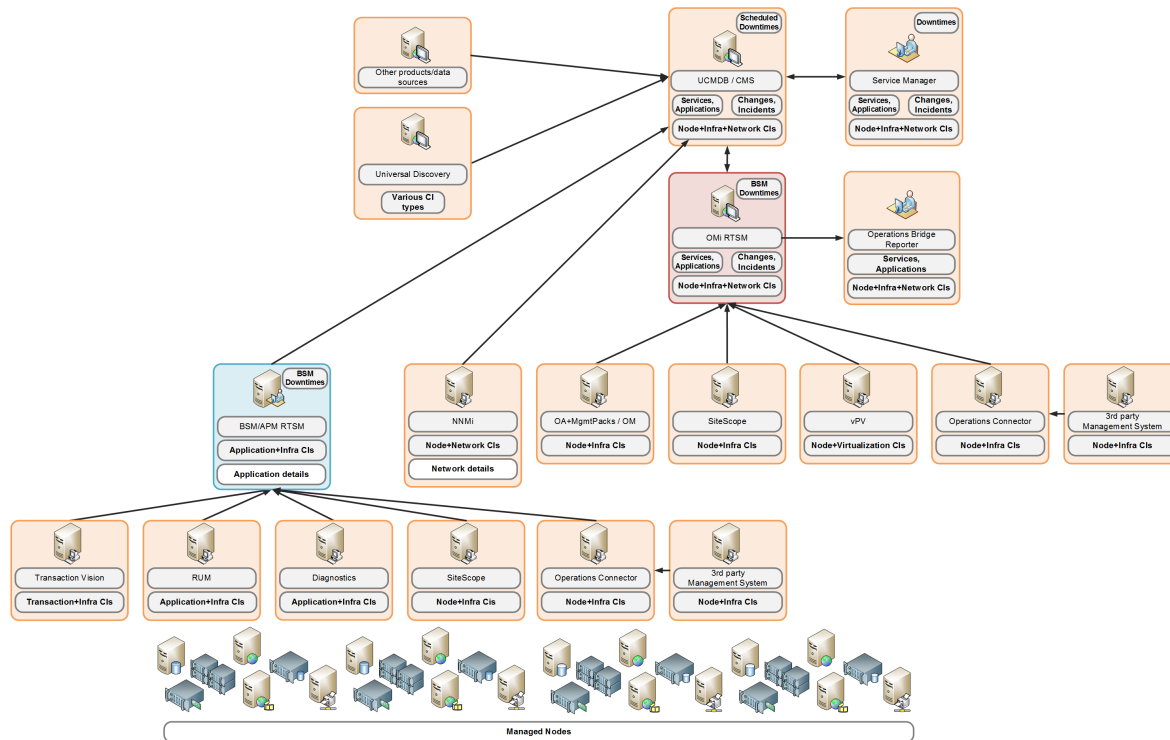
Please note that not all CIs known on one system have to be synchronized to the other. For example, infrastructure details that are not required in the central CMS system (like CPU CIs) could be maintained in the OMi system only. In the same way some application details are kept in APM as they are not relevant on the Operations Bridge.

With an external UCMDB it is a best practice to integrate Service Manager, Universal Discovery and any other 3rd party CMDBs with the CMS system, where reconciliation takes place. Reconciled CIs are then synchronized with the BSM solution.

BSM architecture without a separate UCMDB / CMS

In smaller environments where there is no need and no plans to support other initiatives and where the additional capabilities that UCMDB provides are not required, you have the option to use OMi as the central system that consolidates topology for the BSM solution. In this case Service Manager, Universal Discovery and other 3rd party CMDBs integrate with OMi directly.
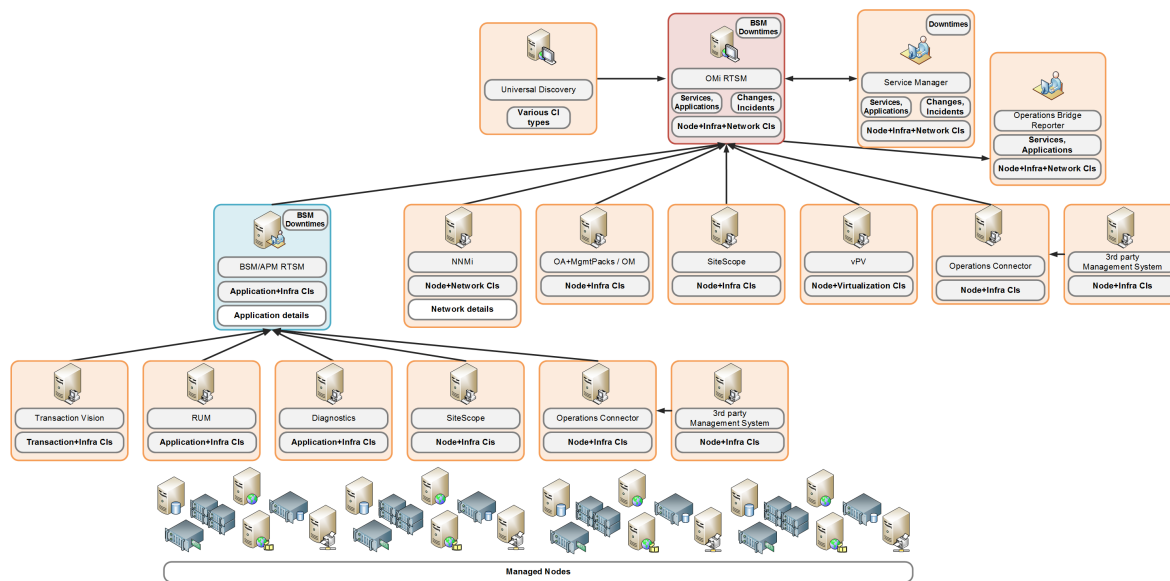
Variant: BSM architecture with multiple OMi/APM systems

OMi supports hierarchical deployments with split responsibilities. In an environment with multiple RTSM systems, each RTSM should synchronize topology with the Global ID Generator, which could be a UCMDB system or the top-level OMi system. See also "The role of the Global ID Generator" on page 15.

UCMDB as the Global ID Generator
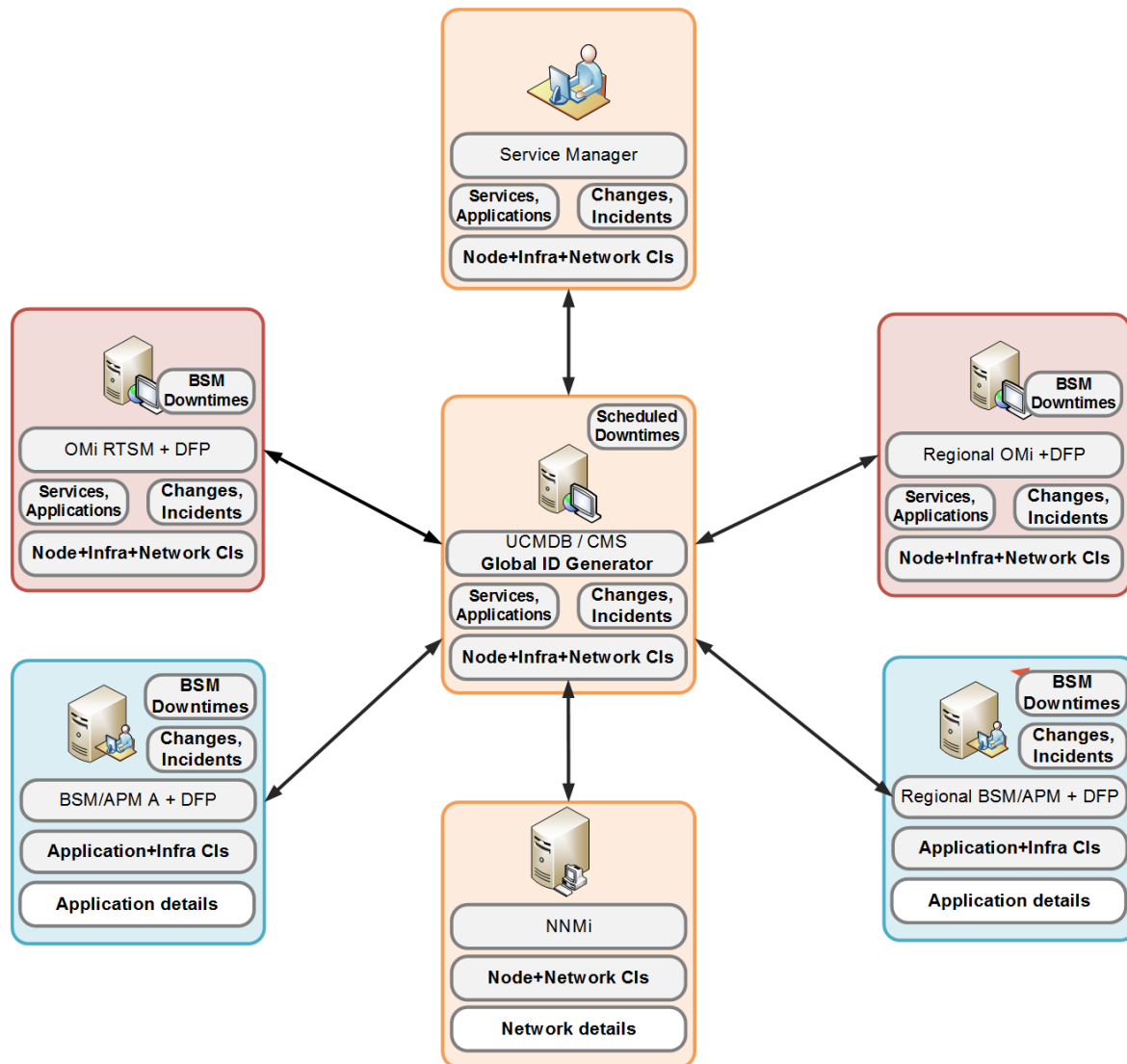
OMi as the Global ID Generator
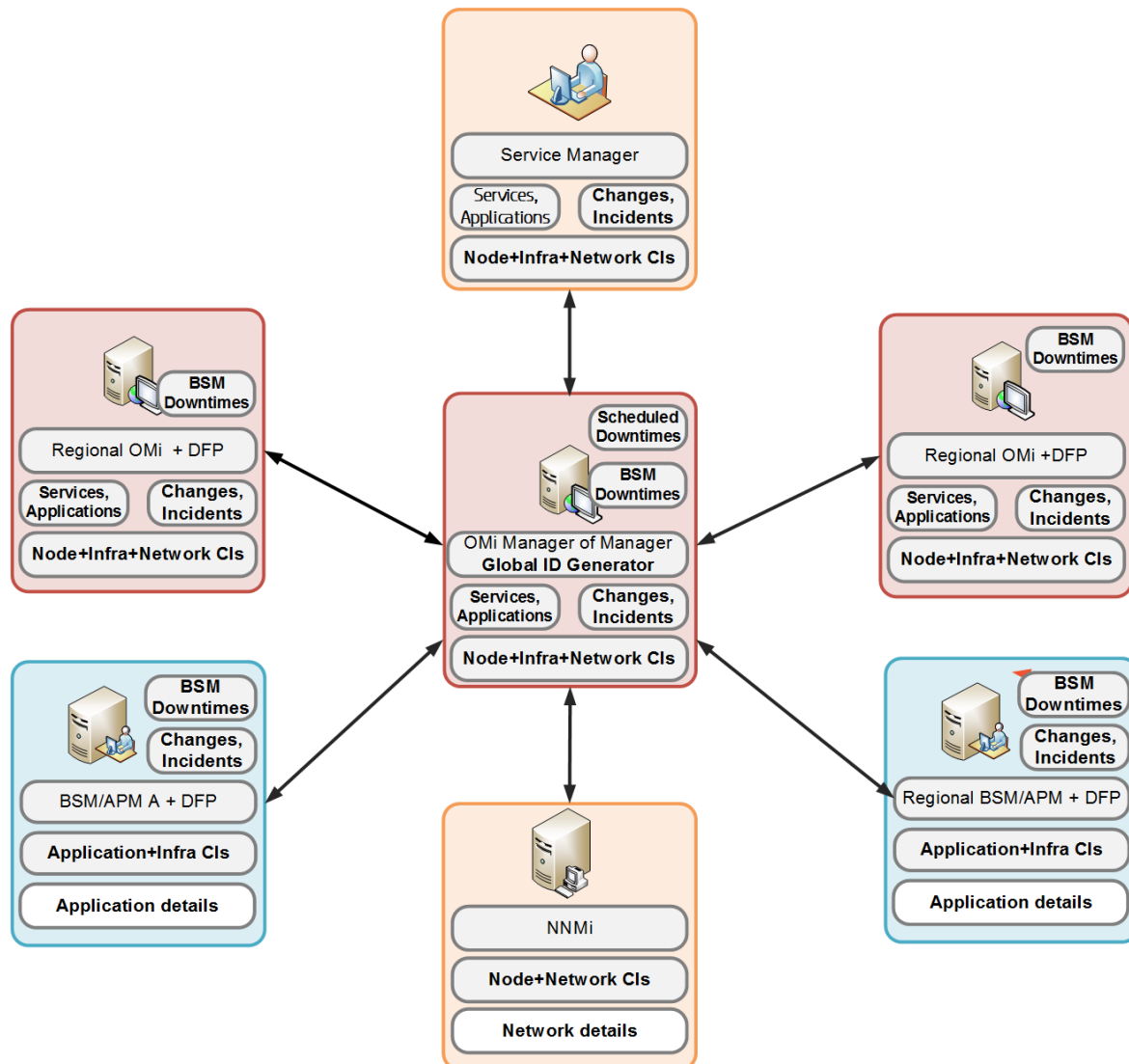
Variant: BSM architecture with third-party CMS

A separate UCMDB system can integrate with other products such as a third-party CMS as shown in the graphic below. There are several integration adapters available. See the UCMDB licensing for details about required licenses and the UCMDB documentation for details about a specific adapter: To access the documentation, create an integration point, select the adapter and then click **?** Help to get the adapter-specific documentation.

OMi's RTSM is also able to integrate with third-party CMS systems using the same adapters, and also requires a corresponding UCMDB license for the adapter. Therefore there is no difference between the

two architectures from a licensing standpoint. However, using a separate UCMDB system can provide additional control as the integration results can be checked on the UCMDB system before CIs are pushed to the RTSM.
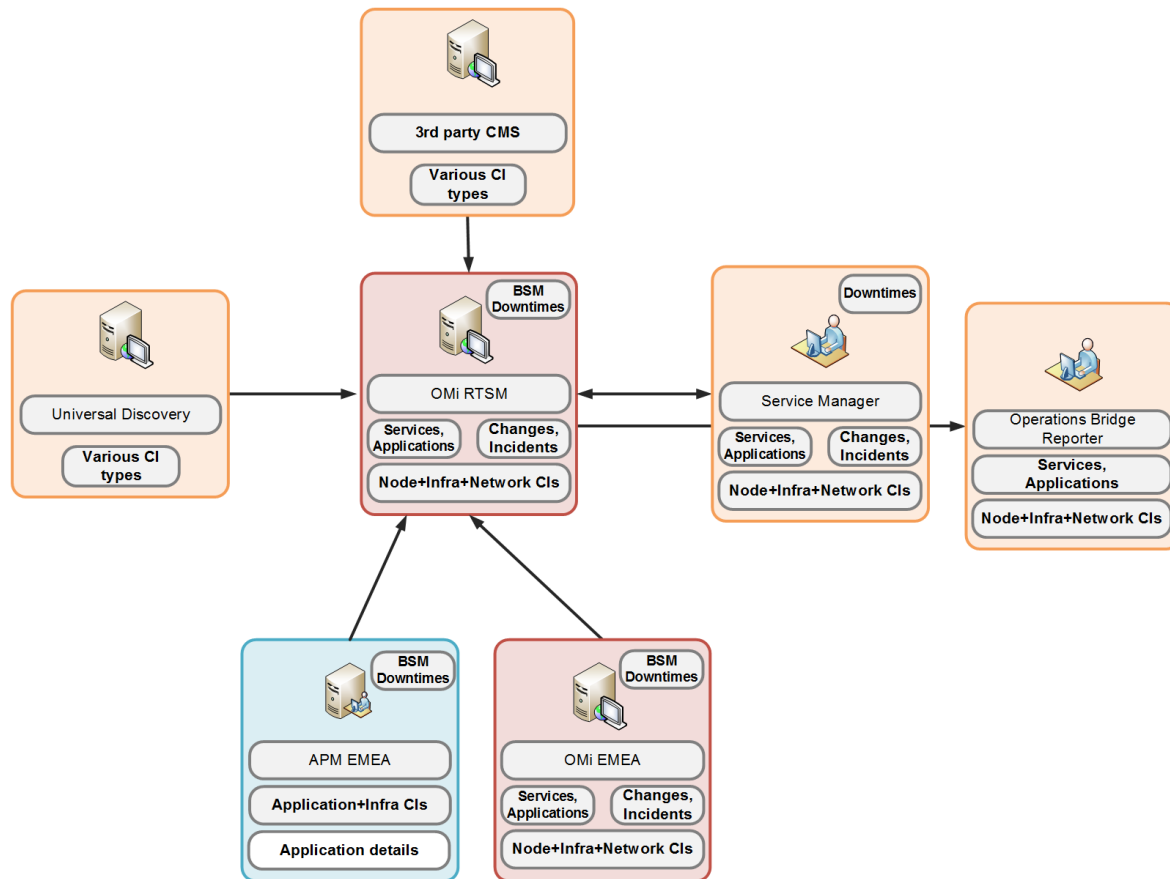
Synchronization in a multi-RTSM/CMDB environment

Use cases for topology synchronization

In an environment with multiple RTSM and CMDB systems, there are different use cases for synchronizing topology data between systems. Data Synchronization is not always done in both directions. Depending on the use case, CIs are exchanged in one or two directions.

Typical use cases for topology synchronization in a BSM solution are:

1. Use case A: Business Service topology is maintained in one CMDB only and should be synchronized to other CMDB/RTSMsystems. For example:

   Business service CIs maintained in UCMDB -> synchronize to OMi RTSM / APM RTSM

2. Use case B: Infrastructure and application CIs are discovered by a specific CMDB/RTSM system and should be synchronized with the Operations Bridge (and central CMS) and other CMDB systems. For example:

   ○ Network and node CIs discovered by NNMi -> UCMDB -> OMi RTSM / APM RTSM

   ○ Infrastructure CIs discovered by OMi Management Packs of EMEA OMi deployment –> UCMDB -> Manager of Manager OMi deployment

   ○ Business application CIs and linked infrastructure CIs maintained in APM –> UCMDB -> OMi RTSM(s)

   ○ Infrastructure CIs discovered by APM / OMi / NNMi -> UCMDB -> Service Manager

3. Use case C: Downtime definitions maintained in Service Manager should be synchronized with UCMDB and monitoring systems, for example:

   Downtime definition maintained in Service Manager -> UCMDB -> OMi RTSM(s) / APM RTSM

Types of topology synchronization

Synchronization is performed over secure communication channels through Data Flow Probes (DFPs). An RTSM as well as a UCMDB system supports three different ways to integrate topology data:

- Population: An integration of type Population copies data from an external data repository into the RTSM/UCMDB (DFP is connected to system that receives the data).

- Data Push: An integration of type Data Push copies data from the RTSM/UCMDB to an external data repository (DFP is connected to system that sends the data).

- Federation: An integration of type Federation includes data in the RTSM/UCMDB from other sources in such a way that the source of the data still retains control of the data (DFP is connected to system that receives the data).

For more detailed information about the different integration types, see the *OMi Data Flow Management Guide*.

The role of the Global ID Generator

The Global ID is a unique CI ID that identifies that CI across the entire solution, making it easier to work in multiple CMDB environments. The Global ID is used to pass a CI context from one product to another.
In an architecture with an external UCMDB, the global ID should be generated by the external UCMDB system. In an architecture without an external UCMDB, the OMi Manager of Manager System acts as Global ID Generator.
We recommend to synchronize CIs directly with the Global ID Generator so that all CIs get the Global ID that is necessary to pass the CI context among systems as soon as possible. We recommend to configure the correct Global ID Generator right from the beginning of an implementation project.

Chapter 3: Synchronize topology data

See the following sections for best practices on how to synchronize topology data:

Overview

The previous topic explained the topology synchronization conceptually. This topic describes how the topology synchronization is configured using the different RTSM synchronization types. (Note: the NNMi topology integration uses another technology, see the NNMi manuals for details).

To synchronize topology, several integration points have to be configured. The following graphic gives an overview of all the necessary connections using population, push, or federation. If multiple OMi or APM systems are used, topology synchronization has to be configured for all of them accordingly.

With a separate UCMDB / CMS

1.   Flow into UCMDB:

Push ⟶
Population ⤏
Federation ⋯▸
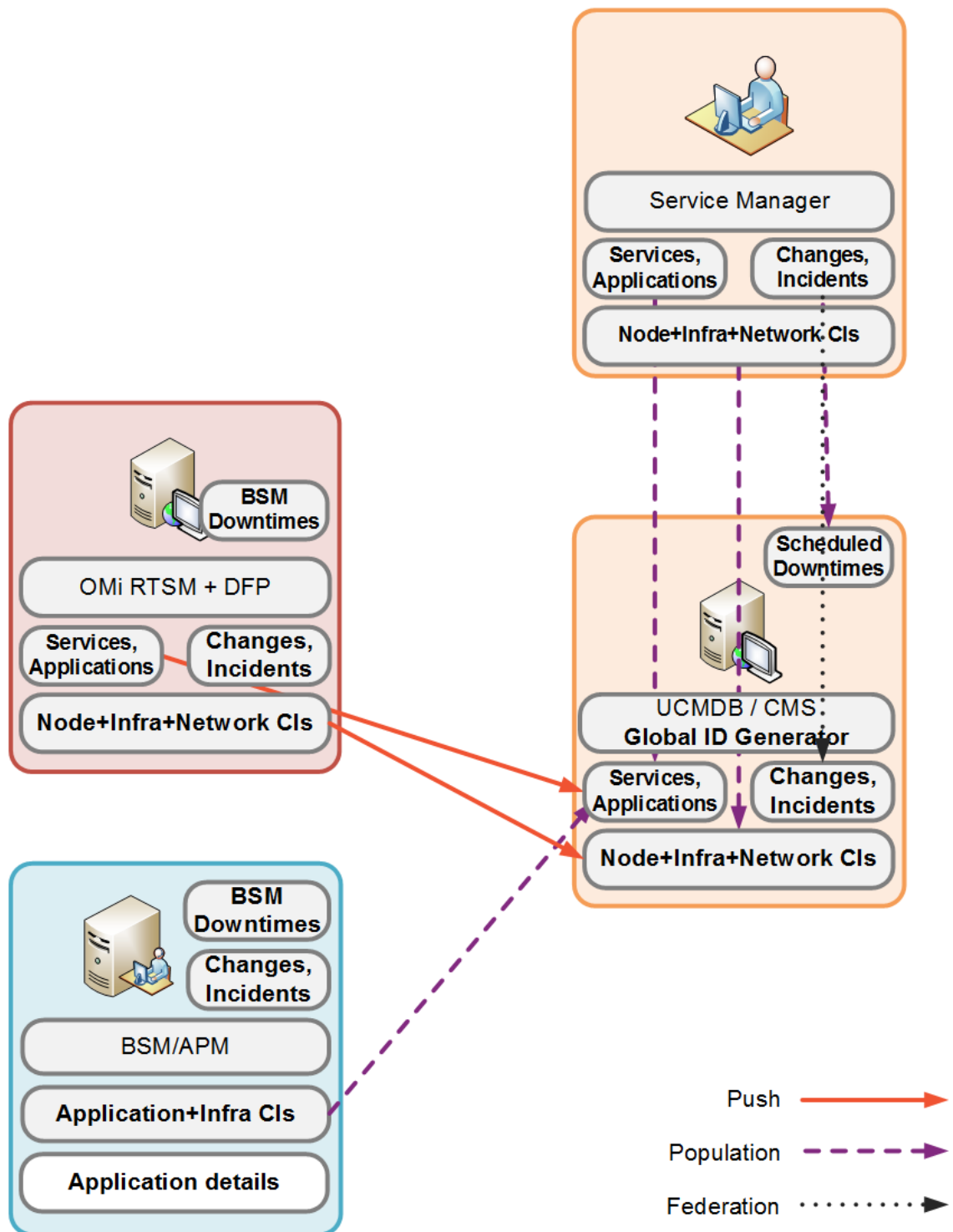
2.   Complete topology flow:
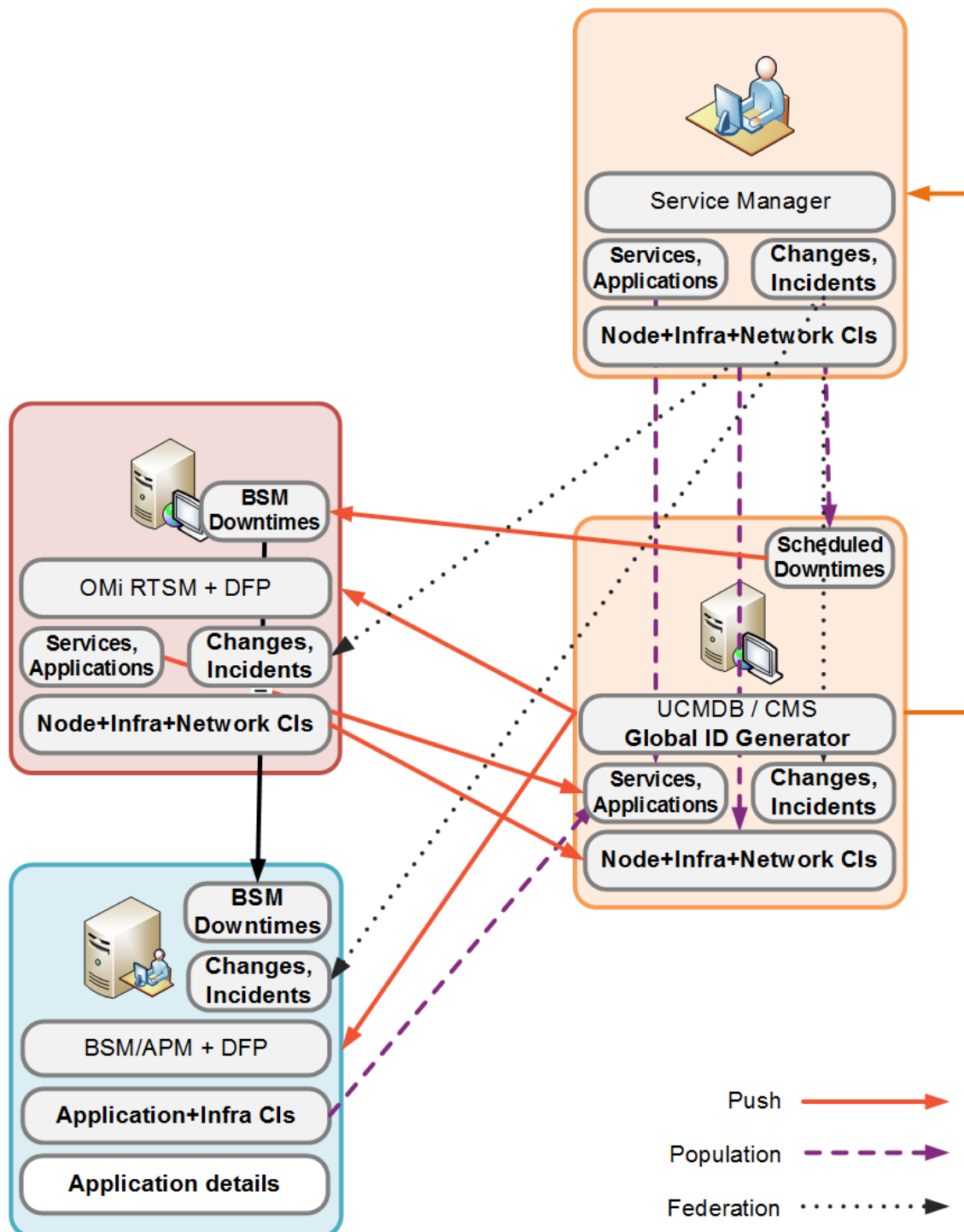
Without a separate UCMDB / CMS

1.　　　　Flow into OMi:
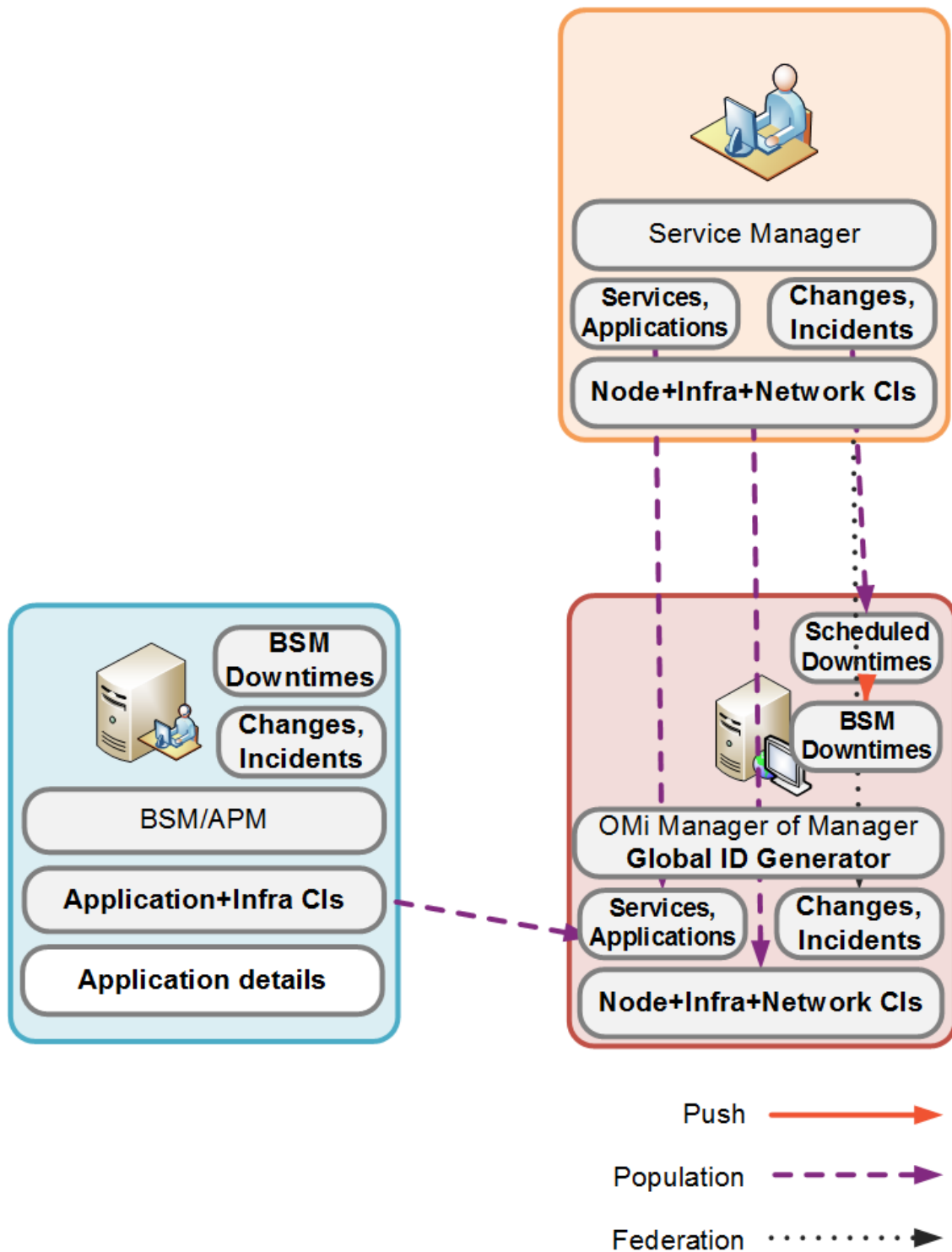
2.   Complete topology flow:
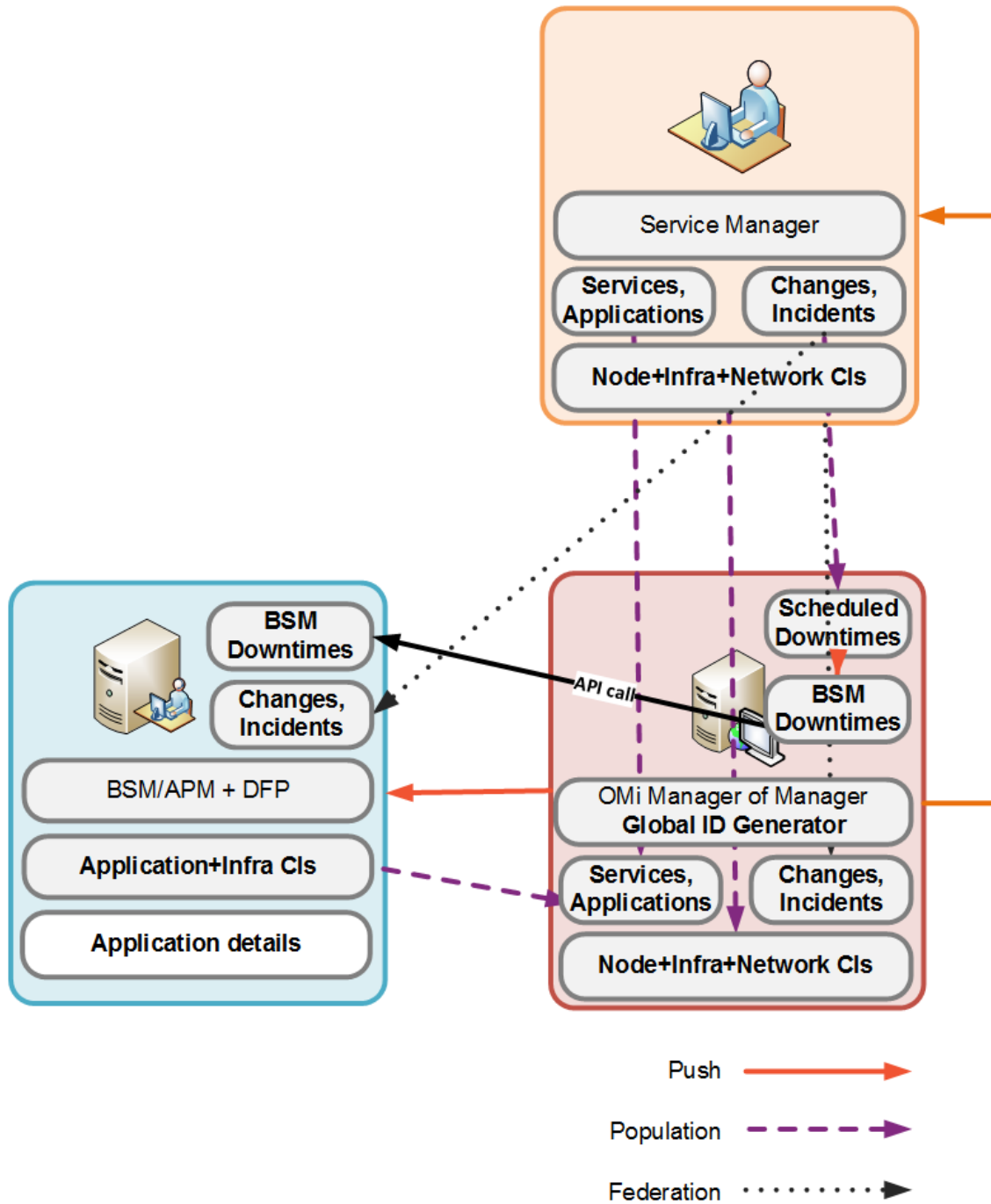
Best Practices

- For topology integrations, use a star-architecture with the Global ID Generator in the center – synchronize topology with the Global ID Generator so that all CIs get the Global ID that is necessary to pass the CI context among systems as soon as possible.

- Configure the correct Global ID Generator right from the beginning of an implementation project as a later switch requires manual configuration changes during which topology is not exchanged and during which all features relying on Global IDs cannot be used.

- Synchronize with the actual state UCMDB, not with the authorized state CMDB as for Operations Management the actual state of the environment is relevant, not the planned or approved state.

- Synchronize only those CIs that are required on the target systems to avoid unnecessary resource consumption.

- Data push is recommended instead of data population, as it supports more CIs.

  The RTSM of BSM 9.x and UCMDB 9.x versions does not support data push, therefore to integrate topology from these systems, use data population.

- Push back global IDs to connected RTSM/UCMDB systems. Global IDs are necessary for event forwarding and UI integrations.

- Synchronize all attributes of CIs (check the element layout of each object in the query) to avoid inconsistencies in display labels and to make sure that all attributes required by OMi/APM (for example, the monitored_by attribute) are synchronized.

- Install the Data Flow Probe connected to OMi on an OMi Gateway server or OMi GW/DPS system to avoid the need of an additional server.

- For better accountability and auditing, create and use dedicated integration users for each integration.

- If a load balancer is used, specify the load balancer/virtual address in integration points instead of the BSM/OMi Gateway server address.

- First test the integrations on test systems without scheduling and run integration jobs manually. Enable scheduling after you have verified that the correct CIs are created. Then replicate the configuration on production systems.

- The flag **Allow job to delete CIs** should only be used when the authoritive source deletes CIs. CIs might still be referenced in reports, closed or even open events, so you might want to keep these CIs as long as those references exist. OMi does not use aging to delete CIs discovered by

Operations Connector or Operations Agents, but OMi will delete CIs when they are no longer discovered for a while. If you use aging in UCMDB and regard the UCMDB as authoritive source then you can select **Allow job to delete CIs** in push jobs from UCMDB to other systems.

- Service Manager-related recommendations

  ○ Follow the recommendations of the Technical White Paper Recommendations for Global ID Best Practices in CMS (make sure that the UCMDB setting reconciliation.match.attributes is set to global_id).

  ○ Use SM 9.41 or later as it supports logical names and duplicate CI display labels. See the Technical White Paper Service Manager Logical Name Solution.

  ○ When synchronizing CIs of the type Running Software using SM 9.40 or before make sure that you follow the instructions in "Special configuration for Running Software CIs" on page 39 before synchronizing CIs.

  ○ For CIs/CI Relationships that are already created in SM and which UCMDB/OMi can automatically discover, run a one-time population to synchronize them to UCMDB/OMi, and then use UCMDB/OMi as their data source. Afterwards, UCMDB/OMi is regarded as the authoritive source for CIs, which will discover and push CIs into Service Manager. The default behavior of the UCMDB-SM push integration is that CIs will be updated and created automatically.

  ○ For CIs that are not discovered by UCMDB/OMi, use SM as data source and populate changes to UCMDB/OMi. Adjust the synchronization jobs accordingly.

Notes

- CIs that are referenced or used in event processing, Service Health, or Monitoring Automation must not be federated. Federation of such CIs into OMi's RTSM will cause performance problems. For example, do not federate nodes or Running Software CIs that are referenced in CI hints or in views that are used in Monitoring Automation automatic assignment rules.

- If UCMDB is installed on Windows and if you can access all CMDB/RTSM systems from that system, then you can use the UCMDB integration service on the UCMDB server for RTSM/UCMDB synchronizations. See the UCMDB online help for more details.

- A Data Flow Probe is connected to an RTSM/UCMDB system during its installation. The DFP version must match the version and patch level of this RTSM/UCMDB system. That means a DFP connected to a BSM system based on UCMDB 9 must be a DFP version 9, DFP connected to OMi

10 must be version 10, and so on.

However, once installed and connected to an RTSM/UCMDB, a DFP can exchange data between UCMDB and RTSMsystems of different versions.

- Using HTTP/HTTPS: The decision whether to use HTTPS or HTTP should be driven by your security needs. Integrations can work with both protocols. For integrations it is not necessary to implement HTTPS for all servers.

- In APM RTSM aging of CIs is disabled per default.

- In OMi RTSM aging of CIs discovered by BSMC or Operations Agents is disabled per default.

- Check the deployment or installation instructions of UCMDB, BSM and OMi for sizing limitations. As a guideline: a UCMDB system can handle more CIs than an OMi 10.x RTSM, which can handle more CIs than a BSM 9.x RTSM.

- OMi's RTMS runs in multi-tenant mode and CIs of multiple tenants can be synchronized between UCMDB and OMi systems, but OMi does not support authorization based on tenants as in UCMDB. However, in OMi you can grant view permissions for CIs based on views. If the tenant relationship is used to create tenant-specific views, then a similar behavior can be achieved in OMi.

Which queries should be used?

In many integrations, queries are used to specify the data being transferred. Some integration adapters provide default queries, for other integrations default queries are available (like the RTSMtoCMSSync) but not automatically used when the adapter is selected.

Typically, it is also possible to use other queries or to extend the default queries — review the corresponding adapter documentation if you want to extend the data that is transferred.

Here is an overview of the queries that are often used for RTSM/UCMDB synchronization:

- "APM-OMi sync queries" below

- "Management Pack sync queries" on the next page

- "Business Element and Network sync queries" on page 25

- "Other sync queries contained in CMS_to_RTSM_Sync.zip" on page 25

APM-OMi sync queries

Location: BSM 9.25 or later: `Integration > OMi_integration` folder

All queries sync all attributes.

Query	Usage and description
OMi_ Sync_ Biz	Used for APM > OMi integration, synchronizes BusinessApplication CIs and related CICollection and related Service CIs
OMi_ Sync_ BPI	Used for APM > OMi integration, synchronizes BusinessActivity, BusinessProcess, and BusinessProcess Scope CIs
OMi_ Sync_ Diag_ TV	Used for APM > OMi integration, synchronizes Computer, NodeElement RunningSoftware, Process, ApplicationResource, ApplicationSystem, IpServiceEndpoint, and SAP Resource CIs monitored by Diagnostics or TV and related BusinessElement CIs linked to SAP Resources
OMi_ Sync_ SiS	Used for APM > OMi integration, synchronizes Computer, RunningSoftware, ApplicationResource, ApplicationSystem, SAP Resource CIs monitored by SiteScope and related BusinessElement CIs linked to SAP Resources
OMi_ Sync_ SiS_ EMS	Used for APM > OMi integration, synchronizes EMS Monitor, EMS Measurement, and EMS Group CIs

Note: CIs with monitored_by OM are expected to be moved from BSM to OMi during the OMi upgrade from OMi 9 to 10.x (and then maintained in OMi 10). Therefore there are no synchronization queries for monitored_by OM CIs. CIs with monitored_by RUM are not synchronized to OMi as those CIs are typically not monitored by OMi directly. KPI status calculated based on RUM data on Business Application CIs is forwarded to OMi.

Management Pack sync queries

Each Management Pack typically creates a specific application topology in RTSM and ships one or more views that show this topology. Most Management Packs contain deployment views, like MSSQL_Deployment or HANA_Deployment, which can be used as the starting point for synchronization queries.

Open such a query, save it under a new name in the CMS Sync folder and specify the type **Integration** in the query properties:

Query Definition Properties

Type: | Integration

Make sure that the queries sync all attributes of all CI types specified in the query.

Test your queries and add further conditions to the query node properties if the query returns too many CIs.

> **Note:** In the future, HPE plans to provide such sync queries for each Management Pack on the ITOM Maketplace.

Business Element and Network sync queries

Location in OMi 10: CMS Sync folder

> **Note:** Queries can also be uploaded to UCMDB by deploying the zip file `<OMi_Home>\odb\conf\factory_packages\CMS_to_RTSM_Sync.zip` to UCMDB.

Query	Usage and description
RTSMtoCMSSync	Useful for RTSM > UCMDB, UCMDB > RTSM and RTSM > RTSM synchronization, synchronizes Business Element CIs, CICollections, and related Infrastructure Element, Party and Location CIs. **Note:** Make sure that the element layout of each object in this query synchronizes all attributes.
Network_Sync	Synchronizes Layer2Connection and IpSubnet CIs and related Interface, Node, IpAddress, and Hardware Board CIs **Note:** Make sure that the element layout of each object in this query synchronizes all attributes.

Other sync queries contained in CMS_to_RTSM_Sync.zip

Location in OMi 10: CMS Sync folder

> **Note:** Queries can also be uploaded to UCMDB by deploying the `<OMi_Home>\odb\conf\factory_packages\CMS_to_RTSM_Sync.zip` to UCMDB.

Query	Usage and description
ActiveDirectory__Sync, BasicInfrastructure_Sync, BusinessAndFacilities_Sync, Credentials_Sync, ExchangeServer_Sync, FailoverCluster_Sync, IIS_ Sync, J2EE_Sync, SAP_ Sync, Siebel_Sync, SOA_ Sync, Virtualization_Sync	These queries have been developed to synchronize CIs discovered by UCMDB Data Flow Probes into BSM 9.x. The used model differs slightly from the model created or expected by OMi Management Packs. Furthermore all queries synchronize the Global ID attribute only (plus all attributes needed for identification), but for APM/OMi-UCMDB synchronization all attributes should be synchronized. It is therefore recommended to use the Management Pack sync queries instead.

Which sequence must be followed?

There is no specific sequence which integration point should be created first (unless it is specifically mentioned as prerequisite). However, we recommend to define the Global ID Generator before starting integrations.

If you plan to populate existing CIs from Service Manager into UCMDB/OMi, start with this one-time population.

Some integration features rely on Global IDs, namely the cross-launch features (View Business Impact Report from SM, View APM details inside OMi MyWorkspace pages). Those features will only work after Global IDs have been created and exchanged between the relevant systems.

Tasks

This section includes the following tasks:

- "How to enable Global ID Generation on a UCMDB system" on the next page

- "How to enable Global ID Generation on an OMi system" on the next page

- "How to integrate APM CIs into OMi" on page 28

- "How to integrate APM CIs into UCMDB 10.x" on page 28

- "How to integrate NNMi CIs into OMi" on page 29

- "How to integrate OMi 10.x CIs into UCMDB 10.x" on page 29

- "How to integrate UCMDB CIs into OMi 10.x" on page 31

- "How to integrate UCMDB 10.x/OMi 10.x CI into APM RTSM" on page 32

How to enable Global ID Generation on a UCMDB system

1. Log on to the UCMDB JMX console (default port 8080) and select `UCMDB:service=Multiple CMDB Instances Services`.

   For example, use this link on the UCMDB server: `http://localhost:8080/jmx-console/HtmlAdaptor?action=inspectMBean&name=UCMDB:service=Multiple%20CMDB%20Instances%20Services#setAsGlobalIdGenerator`

2. Log on as the `sysadmin` and specify the JMX administrator password you defined during the UCMDB installation.

3. Invoke `setAsGlobalIdGenerator` with `customerID 1` and `dbTimeout -1`.

How to enable Global ID Generation on an OMi system

OMi can be defined as Global ID Generator as part of the APM integration. In step 1 of the integration, choose the option **Use OMi as Global ID Generator** (if the option is grayed out, a global ID generator already exists in your environment).

You can also enable Global ID Generation using the OMi RTSM JMX console as follows:

1. Log on to the OMi RTSM JMX console (default port 29912) and select `UCMDB:service=Multiple CMDB Instances Services`.

2. If not enabled for remote access, the JMX-console is only available locally:

   `http://localhost:29912/HtmlAdaptor?action=inspectMBean&name=UCMDB:service=Multiple%20CMDB%20Instances%20Services#setAsGlobalIdGenerator`

3. Log on as the `sysadmin` and specify the JMX administrator password you defined during the OMi

installation.

4. Invoke `setAsGlobalIdGenerator` with `customerID 1` and `dbTimeout -1`.

How to integrate APM CIs into OMi

Follow the *OMi Integrations Guide*: OMi – APM integration. This automatically creates the following integration point on the OMi system:

Field	Value	Description
Name	APM2OMi <ConnectedServer>	Automatically set using Connected Server name of the APM server.
Adapter	UCMDB 9.x	BSM 9.x uses UCMDB 9.x technology.
Type	Population	UCMDB 9.x does not support push, therefore population is used.
Jobs	sync_continuous sync_initial	Automatically created. Both use the same queries.
Queries	OMi_Sync_Biz OMi_Sync_BPI OMi_Sync_Diag_TV OMi_Sync_SiS OMi_Sync_SiS_EMS	You can delete unnecessary queries from the integration point or specify additional queries (that must exist on the APM system) to synchronize other CIs into OMi. **Note:** The statistics tab of this integration point will misleadingly show that BusinessTransaction and BusinessTransactionFlow CIs were created. However, these CIs are actually filtered out by a Global Filter. These CI Types should not be synchronized into OMi. Transaction data is available to OMiusers via the integrated APM MyWorkspace components.

The APM components that can be used in an OMi MyWorkspace page use Global IDs to refer to CIs. Make sure that Global IDs are generated or synchronized from the UCMDB system before using those components to drill down into application details inside APM.

How to integrate APM CIs into UCMDB 10.x

In a scenario with an external UCMDB, APM CIs should be directly synchronized with the Global ID Generator. Before synchronizing CIs, align the class models. See "How to align UCMDB and APM/OMi class models" on page 37.

Create the following integration point on the UCMDB system:

Field	Proposed value	Description
Name	APM2OMi <ConnectedServer>	Name will appear in CI properties. Use a meaningful but not too long name (keep integration name plus the query name under 100 characters).
Adapter	UCMDB 9.x	BSM 9.x uses UCMDB 9.x technology.
Type	Population	UCMDB 9.x does not support push, therefore population is used.
Jobs	sync_continuous	Create a job for the ongoing synchronization.
Queries	OMi_Sync_Biz OMi_Sync_BPI OMi_Sync_Diag_ TV OMi_Sync_SiS OMi_Sync_SiS_ EMS	Use the query depending on what APM components are in use or specify additional queries (that must exist on the APM system) to synchronize other CIs into UCMDB.

These sync jobs will return errors if the class models of UCMDB and APM are not aligned, as APM extends the UCMDB class model. To align the models, see "How to align UCMDB and APM/OMi class models" on page 37.

How to integrate NNMi CIs into OMi

Follow the topic *Enabling the NNMi–BSM/UCMDB Topology Integration* of the *Business Service Management/Universal CMDB Topology Integration* section in the NNMi Help.

This integration creates Node CIs and related NodeElement, Interface, Ipaddress, HardwareBoard, PhysicalPort, IpSubnet, Layer2Connection, and Port CIs. By default, NNMi does not discover end nodes. Update the NNMi discovery and monitoring configuration to include the end nodes that you want to see in RTSM/UCMDB.

How to integrate OMi 10.x CIs into UCMDB 10.x

Align the class models as described in "How to align UCMDB and APM/OMi class models" on page 37.

Create an integration point on the OMi system:

Field	Proposed value	Description
Integration Name	Push OMi CIs to UCMDB	Name will appear in CI properties. Use a meaningful but not too long name (keep integration name plus the query

		name under 100 characters).
Integration Description	Pushes key OpsBridge CIs (nodes, RunningSW, applications, services)	Provide an overview so that someone understands the scope of the integration without having to review each job and query in detail.
Adapter	UCMDB 10.x	Required for integration with UCMDB 10.x.
Type	Push	As push is the recommended technology.
Hostname/IP	<FQDN of UCMDB>	
Port	<e.g. 8080>	Use the UCMDB port, the default is 8080.
Protocol	HTTP	Alternatively, use HTTPS if UCMDB requires HTTPS.
Cutomer Name	Default Client	
Remote Machine State	Actual	
Credentials ID	OMiUCMDB	Create and use a dedicated integration user (best practice).
Push Back IDs	Disabled	Irrelevant for Push jobs.
Data Flow Probe	<select>	Choose the DFP that is connected to OMi.
Default owner name	No default owner	Normal case if UCMDB is not used in multi-tenant mode.
Job(s)	Push key OpsBridge CIs	
Queries used in integration jobs	RTSMtoCMSSync and additional queries as needed	To synchronize typical OMi CIs, use RTSMtoCMSSync. This should sync all Business Element and Infrastructure CIs created by OMi MPs, but without the Node Resources. To add Node Resources, add BasicInfrastructure_Sync To add Layer2Connections and subnets, add Network_Sync For more options, see "Which queries should be used?" on page 23.

For more details, see the OMi online help: **Administer > RTSM > RTSM Data Flow Management > Integrations > Integrating Multiple CMDBs**.

How to integrate UCMDB CIs into OMi 10.x

Create an integration point on the UCMDB system:

Field	Proposed value	Description
Integration Name	Push OMi CIs to UCMDB	Name will appear in CI properties. Use a meaningful but not too long name (keep integration name plus the query name under 100 characters).
Integration Description	Pushes key CIs required in OpsBridge (nodes, RunningSW, applications, services)	Provide an overview so that someone understands the scope of the integration without having to review each job and query in detail.
Adapter	UCMDB 10.x	Required for integration with UCMDB 10.x.
Hostname/IP	<FQDN of Gateway/LB>	
Port	<e.g. 80>	Use the Gateway/LB port, the default is 80/443.
Protocol	HTTP	Alternatively, use HTTPS if OMi requires HTTPS.
Cutomer Name	Default Client	
Remote Machine State	Active	
Credentials ID	UCMDBOMi	Create and use a dedicated integration user (best practice).
Push Back IDs	Disabled	Irrelevant as push from Global ID Generator.
Data Flow Probe	<select>	Choose the integration service or DFP that is connected to UCMDB.
Default owner name	No default owner	Leave the default.
Type	Push	A push is the recommended technology.
Job(s)	Push key OpsBridge CIs	
Queries used in integration jobs	RTSMtoCMSSync and additional queries as needed	To synchronize typical OMi CIs, use RTSMtoCMSSync. This should sync all Business Element and Infrastructure CIs created by OMi MPs, but without the Node Resources.

		To add Node Resources, add BasicInfrastructure_Sync To add Layer2Connections and subnets, add Network_ Sync For downtime CIs, see the next section. For more options, see "Which queries should be used?" on page 23.

How to integrate UCMDB 10.x/OMi 10.x CI into APM RTSM

All CIs monitored by APM are created by the corresponding APM data sources, so there is typically no need to integrate infrastructure CIs from UCMDB or OMi into the APM system. However, services, business applications, and CI collections might be modeled in UCMDB or OMi and therefore there might be a need to synchronize those to the APM system.

Note: If you have regional APM systems that should not receive all services and business applications, but only a subset, then you have to adjust the sync queries accordingly.

CIs can be synchronized from UCMDB to APM systems or from OMi to APM systems. As the OMi-APM integration anyhow creates an integration point, we recommend to add the push job to the existing integration point:

Field	Proposed value	Description
Type	Push	A push is the recommended technology.
Jobs	Push services	
Queries used in integration jobs	One or more queries from Management Pack sync queries and Business Element / Network sync queries	Depending on your requirements, choose one or multiple queries to synchronize corresponding CIs to APM.

If you prefer to integrate CIs directly from UCMDB, create an integration point on the UCMDB system:

Field	Proposed value	Description
Integration Name	Push Service CIs to APM	Name will appear in CI properties. Use a meaningful but not too long name (keep integration name plus the query name under 100 characters).
Integration Description	Pushes service CIs and relationship to business applications	Provide an overview so that someone understands the scope of the integration without having to review each job and query in detail.

Adapter	UCMDB 9.x	Required for integration with UCMDB/RTSM 9.x.
Hostname/IP	<FQDN of DPS>	
Port	<e.g. 80>	Use the APM RTSM port, the default is 80.
Protocol	HTTP	Alternatively, use HTTPS if APM requires HTTPS.
Cutomer Name	Default Client	
Remote Machine State	Active	
Credentials ID	UCMDBAPM	Create and use a dedicated integration user (best practice).
Push Back IDs	Disabled	Irrelevant as push from Global ID Generator.
Data Flow Probe	<select>	Choose the integration service or DFP that is connected to UCMDB.
Default owner name	No default owner	Leave the default.
Type	Push	A push is the recommended technology.
Job(s)	Push services	
Queries used in integration jobs	One or more queries from Management Pack sync queries and Business Element / Network sync queries	One or more queries from Management Pack sync queries and Business Element / Network sync queries.

How to integrate CIs between UCMDB/RTSM and SM

Follow the topic *Using Service Manager Enhanced Generic Adapter* in the Service Manager Help.

Following this manual, you will create an integration point on the UCMDB/RTSM system using population, push, and federation:

Field	Proposed value	Description
Integration Name	Enhanced SM integration	Name will appear in CI properties. Use a meaningful but not too long name (keep

		integration name plus the query name under 100 characters).
Integration Description	Push and populate key CIs required in OpsBridge, federate Change, RFCs, Problems	Provide an overview so that someone understands the scope of the integration without having to review each job and query in detail.
Adapter	Software Products > Service Manager > ServiceManagerEnhancedAdapter9.x	Required for integration with SM 9.4x.
Hostname/IP	<FQDN of SM>	
Port	<SM port>	Use the communications port of the Service Manager server, the default is 13080.
URL Override		Use this field If you want to connect to connect to multiple Service Manager systems or if you want to use HTTPS – see the *Integrations Guide* for details.
Credentials ID	UCMDBUCMDB	Create and use a dedicated integration user (best practice).
Developer Mode	False	
Data Flow Probe	<select>	Choose the integration service or DFP that is connected to UCMDB.
Default owner name	No default owner	Leave the default.
Type	Population	
Job(s)	SM Configuration Items Population Job SM Relations Population job	Synchronizes Nodes, Node resources, Running Software, Business Services, Printer, and Network CI Types. For the details, see the integration documentation. Use this for one-time population of existing CIs in SM. See Best Practices/Recommendations.
Type	Federation	
Selected CI Types	Incident, RequestForChange	If incidents and planned changes should be be displayed in OMi's hierarchy and changes / incidents components.

Type	Push	
Job(s)	SM Push job	Nodes, Node resources, Running Software, and Business Services. For details, see the integration documentation.

How to integrate SM Downtime CIs into UCMDB/RTSM

Follow the SM online help **System Administration > Integrations > Business Service Management (BSM) > SM-BSM downtime synchronization**.

By following these instructions, you will add two population jobs to the already existing SM integration point:

Field	Proposed value	Description
Type	Population	A push is the recommended technology.
Jobs	SM CLIP Down Time Population SM CI Connection Down Time CI	

The integration actually consists of two integration points: The first one retrieves downtimes from SM and stores them as scheduled downtime CIs in either the external UCMDB or the RTSM.

The second integration point converts the scheduled downtime CIs into BSM downtime CIs and pushes them to the RTSM.

For the second part, follow the *OMi Integrations Guide* and create an integration point on the UCMDB/OMi RTSM system that received the schedule downtime CIs from SM:

Field	Proposed value	Description
Integration Name	Scheduled Downtime to BSM Downtime	Name will appear in CI properties. Use a meaningful but not too long name (keep integration name plus the query name under 100 characters).
Integration Description	Convert scheduled_ downtimes into BSM downtimes	Provide an overview so that someone understands the scope of the integration without having to review each job and query in detail.
Adapter	SM scheduled Downtime Integration into BSM	Required for converting scheduled DTs into BSM/OMi DTs.
Hostname/IP	<FQDN of Gateway/LB>	

Port	<e.g. 80>	Use the Gateway/LB port, the default is 80 / 443.
Protocol	HTTP	Alternatively, use HTTPS if OMi requires HTTPS.
Credentials ID	UCMDBOMi / OMiOMi	Create and use a dedicated OMi user (best practice) - use Generic Protocol.
Data Flow Probe	<select>	Choose the integration service or DFP that is connected to UCMDB/OMi RTSM.
Type	Push	
Job(s)	Sync SM to BSM	Automatically created with schedule interval 1 min

If an APM system is integrated with OMi, then BSM downtimes created on the OMi system can be synchronized to the APM system as part of the APM integration. This integration uses APIs to synchronize downtimes, therefore it is not required to create an integration point for this.

How to integrate CIs from other UCMDBs or third-party CMDS into UCMDB

Follow the UCMDB documentation for the corresponding adapter. To access the documentation, create an integration point, select the adapter and then click **?** Help to get the adapter-specific documentation.

How to integrate CIs from other UCMDBs or third-party CMDS into OMi

Follow the UCMDB documentation for the corresponding adapter.

How to exchange configuration data between UCMDB and RTSM

Queries, views, CI types and other RTSM/UCMDB artifacts can be exported and imported using the RTSM/UCMDB package manager.

> **Tip:**
> - Views imported from a UCMDB system will not appear in OMi/Service Health components unless the bundle Service_Health is selected in the view definition properties.
>
> - Perspective-based views refer to local UCMDB IDs and cannot be imported on another UCMDB/RTSM system.

How to do manual service modeling

In a solution with multiple RTSM systems, an external UCMDB, a Service Manager system or even a

third-party CMS, the question comes up where the manual service modeling should be done. As seen above, those services and relationships can be synchronized between all systems, so the decision where to do the manual service modeling should be driven by where the most effective tools are available for service modeling.

An external UCMDB system comes with a UCMDB browser which supports templates to model services. It is also the central integration hub, and therefore recommended as the place to do manual service modeling.

In an architecture without UCMDB, the OMi MoM server with UCMDB browser is recommended as the place to do manual service modeling.

> **Tip:** The UCMDB browser which allows modeling using templates can be installed on a BSM or OMi RTSM. https://marketplace.microfocus.com/itom/content/ucmdb-browser-universal-cmdb-0

How to align UCMDB and APM/OMi class models

Synchronization jobs between APM, OMi and UCMDB systems might partially fail, report warnings or synchronize only a subset of attributes if the class models are not aligned. APM and OMi systems extend the UCMDB model for example by adding CI types or by adding attributes to CI types.

To add these extension to the UCMDB model, do the following:

Deploy the following resources to UCMDB by using the UCMDB package manager. Use the specified packages from the `<OMi_Home>`\odb\conf\factory_packages directory on the OMi data processing server system.

RTSM Package	Resources to deploy
Opr.zip	All class and valid links resources
ManagementSystem.zip	All resources
Business.zip	Class `configuration_item_ext` > **Note:** The deployment might take long as all subclasses have to be updated.
EUM.zip	Class `business_application_ext`

OMi Management Packs might add new classes, class extensions, or other resources to the RTSM model, like the OMi Management Pack for Hadoop. If you notice synchronization errors, make sure the corresponding resources are loaded from the Management Pack RTSM package from `<OMi_Home>`\odb\conf\factory_packages\content directory.

Additionally, in the UCMDB CI Type Manager, add the composition relationship between SAP system CI Type and CI Collection CI Type, as otherwise the RTSMtoCMSSync query might fail if those relationships are part of the query results.
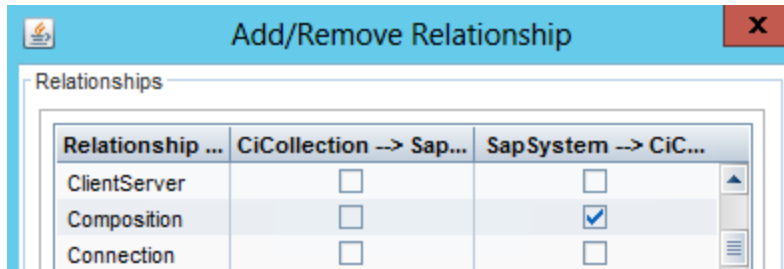
Chapter 4: Special configuration for Running Software CIs

This special configuration is necessary only if Service Manager version 9.40 or earlier is used. Service Manager 9.41 and later versions create CI Identifiers that do not use the display label.

Make sure the Container name attribute is part of Running Software sync queries

Both RTSM and UCMDB have enrichment rules which set the Container name of a Running Software CI to the node name of the node the software is running on. This is reflected in the display label. For example, a Running Software `Vertica` running on node `server01` will get a display label `Vertica (server01)` as a result of this rule.

However, the default `BasicInfrastructure_Sync` query of OMi does not synchronize the container name attribute, which leads to inconsistent display labels until the enrichment rule is run on the UCMDB or OMi server as well. To avoid the unnecessary second run of the enrichment rule on the UCMDB server, add the container name to the element layout of the RunningSoftware CIT in any query that is used for synchronizations:
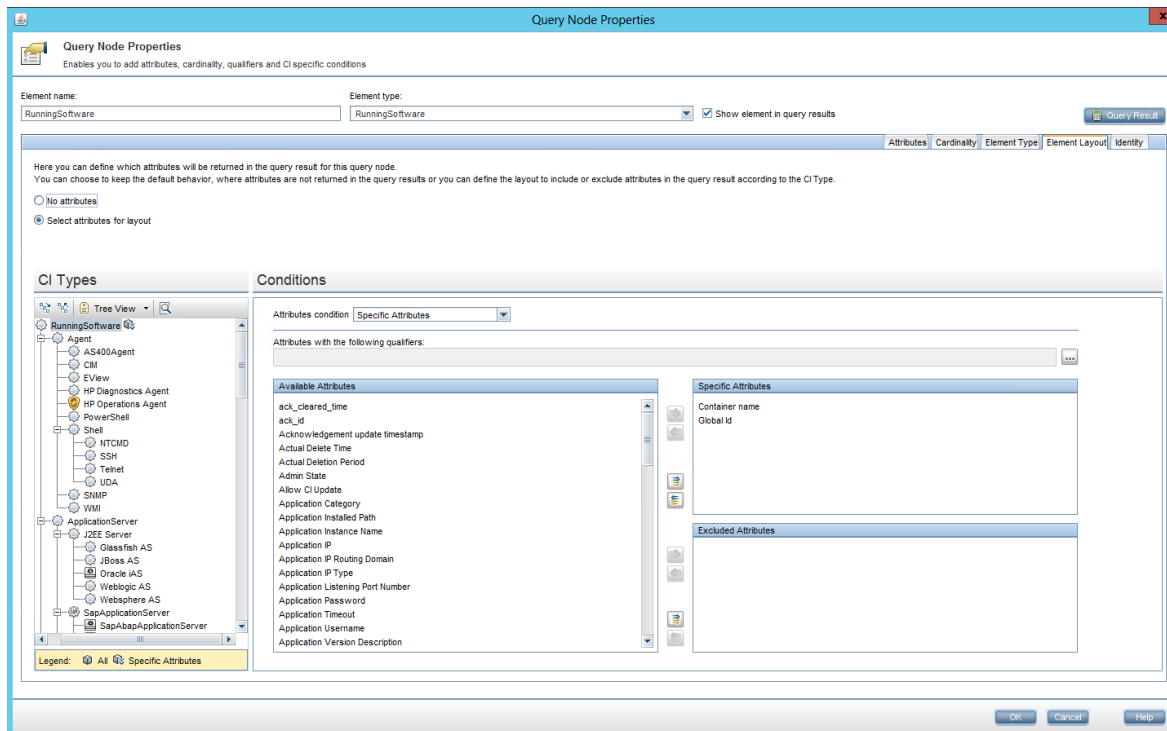
Change Running Software mapping in SM integration adapter

The default SM integration adapter changes the display label of Running Software CIs by adding the node to the display label before the software name. For example, a Running Software with display label `Vertica (server01)` running on the node `server01` will get the display label `server01_Vertica (server01)`. This is superfluous as the UCMDB enrichment rule already adds the node name. Furthermore, the default population jobs will synchronize all running software CIs back to the UCMDB/RTSM and change the label there as well, which is also not desired.

To avoid this, change the adapter configuration. Go to **Adapter Management**, select the SM adapter you are using, navigate to **Configuration Files** and edit the Running Software push configuration file. In case you are using the ServiceManagerEnhancedAdapter-9.x, you can use the Visual Mapping tool to change the mapping: change the CIIdentifier mapping to `Root['display_label']` as shown:

Make sure that the enrichment rule runs before a push to Service Manager

To ensure that Running Software CIs have a unique label when being pushed to Service Manager, schedule the enrichment rule and sync jobs in such a way that the enrichment rule always runs at least once before CIs are pushed to Service Manager. Align the start times and intervals of the jobs accordingly.

In case a Running Software CI is pushed to Service Manager before the enrichment rule run, CIs with duplicate names will not be created. However, CIs for which the push failed will be created during the next push. CIs created without the node in their name will be updated with the next push.

Chapter 5: Use of CI Types in RTSM/UCMDB deployments

The following table lists CI types / class names that are typically used in BSM and OMi RTSM systems. The Producers row shows which software components create CIs of that CI type. The Consumers row shows where corresponding CIs are typically used.

The following abbreviations are used:

- MP Apache = OMi Management Pack for Apache Web Server

- MP Hadoop = OMi Management Pack for Hadoop

- MP WebSphere = OMi Management Pack for IBM WebSphere Application Server

- MP Infra = OMi Management Pack for Infrastructure

- MP JBoss = OMi Management Pack for JBoss Application Server

- MP AD = OMi Management Pack for Microsoft Active Directory

- MP Exchange = OMi Management Pack for Microsoft Exchange Server

- MP IIS = OMi Management Pack for Microsoft IIS

- MP SharePoint = OMi Management Pack for Microsoft SharePoint Server

- MP Skype = OMi Management Pack for Microsoft Skype for Business Server

- MP MSSQL = OMi Management Pack for Microsoft SQL Server

- MP Oracle DB = OMi Management Pack for Oracle Database

- MP Weblogic = OMi Management Pack for Oracle WebLogic

- MP SAP = OMi Management Pack for SAP

- MP Hana = OMi Management Pack for SAP HANA

- MP Sybase = OMi Management Pack for SAP Sybase ASE

- MP Vertica = OMi Management Pack for Vertica

Note: CITs used by ITOM Marketplace Management Packs are not shown in this table.

Class name	Description	Superclass	Producers	Consumers
.NetAppDomain	.NET AppDomain	Application Resource	Diagnostics	Diagnostics
Active Directory Domain	A domain is a partition in an Active Directory forest, and enables organizations to replicate data only to where it is needed. Since Active Directory domains are organized in hierarchical structure, the Active Directory Domain CIT can have one of the two types of container: `Active Directory Forest` or `Active Directory Domain`	Active Directory	OMi (MP AD)	OMi
Active Directory Forest	Active Directory Forest is a logical group of Active Directory Domains.	Active Directory	OMi (MP AD)	OMi
Active Directory Site	A Site object in Active Directory represents a physical geographic location that hosts networks. Sites contain objects called Subnets.	Active Directory	OMi (MP AD)	OMi
Active Directory System	Active Directory System collection of Forests, Domains and Domain Controllers.	Active Directory	OMi	OMi
ActiveDirectoryApplicatio nMode	Identifies the Active Directory Application Mode software	DirectoryServer	OMi	OMi
Agent	Virtual class to all	RunningSoftware	SiS	SiS

Class name	Description	Superclass	Producers	Consumers
	agents			
Apache	Apache Web Server	WebServer	OMi (MP Apache)	OMi
Application Server Role	A Microsoft SharePoint Server that acts as Application Server.	SharePoint Server Role	OMi (MP SharePoint)	OMi
Archiving Server	Archiving Server enables you to archive IM communications and meeting content for compliance reasons.	Lync Server Role	OMi (MP Skype)	OMi
AV Conferencing Server	A/V Conferencing Server provides A/V conferencing functionality to your deployment. It can be collocated with Front End Server, or deployed separately as a single server or A/V Conferencing Server pool.	Lync Server Role	OMi (MP Skype)	OMi
BridgeHeadServer	Bridgehead Servers are the contact point for the exchange of directory information between sites.	DomainControllerRole	OMi (MP AD)	OMi
BusinessApplication	A collection of software components that can be managed as an independent unit that supports a particular business function. An application is a logical composition of the functionality required to manipulate the data	BusinessElement	BPM, RUM, SiS, Diagnostics, OMi	BPM, RUM, SiS, Diagnostics, OMi

Class name	Description	Superclass	Producers	Consumers
	and provide the functional requirements of underlying business processes. An application has a set of supporting infrastructure entities. Example: Call center application, trade application etc.			
BusinessService	Represents business or IT service. A business service is a service that a business provides to another business (B2B) or that one organization provides to another within a business (e.g. payment processing). An IT service is a business service that the IT organization provides to support business services or IT's own operations.	Service	SiS, OMi	SiS, OMi
BusinessTransaction	An end-to-end service provided to end-users or to other related applications (e.g. stock trade, account login, product purchase or billing inquiry), in the IT realm will be provided by an application. Each business transaction has a unique profile that contains a	BusinessElement	BPM, Diagnostics, TV	BPM, Diagnostics, TV

Class name	Description	Superclass	Producers	Consumers
	business context (i.e. activity type, user, time and location, etc.) and a technical profile.			
BusinessTransaction Flow	BusinessTransactio nFlow	CiCollection	BPM, RUM, Diagnostics, TV	BPM, RUM, Diagnosti cs, TV
Central Management Server	The Central Management Store is a centralized configuration database that is used to save configuration data for the entire Lync Server deployment.	Lync Server Role	OMi (MP Skype)	OMi
ClusterResourceGrou p	Represents a cluster resource group ("Cluster Package" in MC/ServiceGuard terminology) on a failover cluster. The CRG provides a runtime environment that is similar to a virtual node (network connectivity).	Node	OMi (MP Infra, SAP)	OMi
ClusterSoftware	The software that provides failover cluster capabilities on a certain node (e.g. the runtime software of MC/ServiceGuard on an HP-UX cluster node).	RunningSoftware	OMi (MP Infra, SAP)	OMi
Computer	This class represents a general purpose machine which has an IP	Node	SiS, OMi (MP Infra)	SiS, OMi

Class name	Description	Superclass	Producers	Consumers
	address, such as Windows, Unix, or Mainframe.			
ConfigurationDocument	A document that contains a block of arbitrary information, or resource for storing information, which is available to a computer program and is usually based on some kind of durable storage.	Application Resource	SiS	SiS
CPU	A central processing unit (CPU) is an electronic circuit that can execute computer programs.	NodeElement	OMi (MP Infra)	OMi
Database	A system that manages a collection of records arranged in a predefined structure and format allowing an efficient retrieval and search of data usually by key data items.	RunningSoftware	Diagnostics, OMi (MP SAP)	OMi, Diagnostics
Datacenter	Represents a Data center entity	BusinessElement	SiS, OMi (MP Infra)	SiS, OMi
DB2	A database from IBM that serves a number of different operating system platforms.	Database	SiS	SiS
DB Data File	The Data File belonging to a database or tablespace.	Database Resource	OMi (MP Oracle DB)	OMi
DB Tablespace	The tablespace belonging to a database.	Database Resource	OMi (MP Oracle DB)	OMi

Class name	Description	Superclass	Producers	Consumers
Diagnostics Probe	A Diagnostics probe deployed on a host	Monitor	Diagnostics	Diagnostics
Diagnostics Probe Group	A logical group of Diagnostics Probes	CiCollection	Diagnostics	Diagnostics
Director Server	Directors can authenticate Lync Server user requests, but do not home user accounts, or provide presence or conferencing services. Directors are most useful in deployments that enable external user access, where the Director can authenticate requests before sending them on to internal servers.	Lync Server Role	OMi (MP Skype)	OMi
DirectoryServer	A directory service is the software system that stores, organizes and provides access to information in a directory. A directory service is a shared information infrastructure for locating, managing, administering, and organizing common items and network resources, which can include volumes, folders, files, printers, users, groups, devices, telephone numbers, and other objects.	RunningSoftware	OMi	OMi

Class name	Description	Superclass	Producers	Consumers
DiskDevice	A DiskDevice is a peripheral device used to record and retrieve information. Main implementations are hard disks, floppy disks and optical discs. They are identified by device name on a given node e.g. /dev/sd0 in UNIX.	NodeElement	OMi (MP Infra)	OMi
DnsServer	A DNS or a Domain Name Server is a registry system for electronic services and resources. The DNS translates domain names which human understand into the appropriate network or application address.	RunningSoftware	OMi (MP AD)	OMi
DomainController	A domain controller is a directory server that physically store the Active Directory information. All domain controllers that belong to the same domain replicate information to each other. A domain controller which is defined as a global catalog server replicate and stores objects from all the domains that belong to the forest.	DirectoryServer	OMi (MP AD)	OMi
DomainController Resource	DomainController Resource	Application Resource	OMi (MP AD)	OMi

Class name	Description	Superclass	Producers	Consumers
DomainControllerRole	DomainController Role	DomainController Resource	OMi (MP AD)	OMi
DomainNamingMaster	The domain naming master domain controller controls the addition or removal of domains in the forest.	DomainControllerRole	OMi (MP Skype)	OMi
Edge Server	Edge Server enables your users to communicate and collaborate with users outside the organization's firewalls.	Lync Server Role	OMi (MP Skype)	OMi
EMS Group	EMS group	Group	SiS	SiS
EMS Measurement	EMS event	System Monitor	SiS	SiS
EMS Monitor	EMS monitor	System Monitor	SiS	SiS
End User Group	Logical group which separates content from the monitors.	BusinessElement	RUM	RUM
End User Subgroup	End User Subgroup	End User Group	RUM	RUM
Exchange Client Access Server	The Client Access server is the server that users connect to with their mail client, mobile device, or web browser. The Client Access server handles all connections whether they come from an application such as Outlook, Outlook Express, or any other MAPI, POP3, or IMAP4 client. The Client Access server also handles connections made	Exchange role	OMi (MP Exchange)	OMi

Class name	Description	Superclass	Producers	Consumers
	from mobile devices such as a Windows Mobile 5 Smartphone, or any other device using Exchange ActiveSync. This role also provides Outlook Web Access (OWA).			
Exchange Database Availability Group	A database availability group (DAG) is a set of up to 16 Microsoft Exchange Server 2010 Mailbox servers that provide automatic database-level recovery from a database, server, or network failure. Mailbox servers in a DAG monitor each other for failures. When a Mailbox server is added to a DAG, it works with the other servers in the DAG to provide automatic, database-level recovery from database, server, and network failures.	Exchange	OMi (MP Exchange)	OMi
Exchange Edge Server	The Edge Transport role is installed on the edge of the network and therefore is installed on a standalone server that is not a member of the Active Directory domain. Active	Exchange Transport Server	OMi (MP Exchange)	OMi

Class name	Description	Superclass	Producers	Consumers
	Directory Application Mode (ADAM) is used to sync AD with the Edge Transport server. ADAM and a component called EdgeSync are used to perform scheduled one-way synchronization of the configuration and recipient information from Active Directory. This allows the Edge Transport to perform recipient lookups and Spam filtering.			
Exchange Hub Server	The Hub Transport role is responsible for all internal mail flow. This role is similar to the bridgehead server in an Exchange 2000/2003 organization. The Hub Transport server is installed on member server(s) in an Active Directory domain. Because it is a member of an AD domain, all its configuration information is stored in AD and any other Hub Transport servers will get their configuration from AD.	Exchange Transport Server	OMi (MP Exchange)	OMi
Exchange Mail Server	Mailbox role holds the Exchange databases within	Exchange role	OMi (MP Exchange)	OMi

Class name	Description	Superclass	Producers	Consumers
	which the user mailboxes are contained. It is also home to the Public Folder databases if you enabled Public Folders.			
Exchange Mailbox Database	Exchange storage group — a logical container for Exchange databases and their associated system and transaction log files.	Microsoft Exchange Resource	OMi (MP Exchange)	OMi
Exchange Organization	This class represents Exchange Organization.	Exchange	OMi (MP Exchange)	OMi
Exchange role	Role of exchange server in global scope. One exchange server can have several roles. Server roles allow an administrator to split the functions of an Exchange server and place each role, or a combination of roles, on different servers in the organization. This type is a common super-type for specific roles, which are: - Edge Transport - Hub Transport - Client Access - Mailbox - Unified Messaging	Microsoft Exchange Resource	OMi (MP Exchange)	OMi
Exchange Storage Group	Exchange storage group - a logical container for Exchange databases	Microsoft Exchange Resource	OMi (MP Exchange)	OMi

Class name	Description	Superclass	Producers	Consumers
	and their associated system and transaction log files.			
Exchange Transport Server	This CIT is a common super-type for two transport roles: Edge role and Hub role.	Exchange role	OMi (MP Exchange)	OMi
Exchange Unified Messaging Server	This server role enables Unified Messaging for an Exchange 2007 organization. Unified Messaging lets users access their Exchange 2007 mailbox over any telephone for e-mail, voice mail, fax messages, and calendaring and contact information. The Unified Messaging role is responsible for merging VOIP infrastructure with Exchange organization. It provides the capability to: - combined voice, fax, and mail in one inbox - access to voice, fax and mail via multiple interfaces	Exchange role	OMi (MP Exchange)	OMi
FailoverCluster	A FailoverCluster is a Cluster that is implemented primarily for the purpose of providing high availability of services which the	Cluster	OMi (MP Infra, MSSQL, SAP)	OMi

Class name	Description	Superclass	Producers	Consum ers
	cluster provides. They operate by having redundant computers or nodes which are then used to provide service when system components fail.			
FileSystem	A file system mounted on a Node.A file system provides the means for storing and organizing computer files and the data they contain to make it easy to find and access them. This class corresponds to the general notion of file system used by Unix, Windows, Linux, etc.	NodeElement	OMi (MP Infra, MSSQL)	OMi
Front End Server	The Front End Server is the core server role, and runs many basic Lync Server functions. The Front End Server, along with the Back End Servers that provide the database, is the only server role required to be in any Lync Server Enterprise Edition deployment.	Lync Server Role	OMi (MP Skype)	OMi
GlobalCatalogServer	The global catalog is a distributed data repository that contains a searchable, partial	DomainControllerRole	OMi (MP Infra)	OMi

Class name	Description	Superclass	Producers	Consumers
	representation of every object in every domain in a multidomain Active Directory forest.			
HACMP Application Resource	HACMP Application Resource	HACMP Resource	OMi (MP Infra)	OMi
HACMP Group	HACMP Group	ClusterResourceGroup Config	OMi (MP Infra)	OMi
HACMP Resource	HACMP Resource	ClusterResourceConfig	OMi (MP Infra)	OMi
Hadoop Cluster	Hadoop Cluster	ApplicationSystem	OMi (MP Hadoop)	OMi
Hadoop Master	Hadoop Master	RunningSoftware	OMi (MP Hadoop)	OMi
Hadoop Slave	Hadoop Slave	RunningSoftware	OMi (MP Hadoop)	OMi
HP Diagnostics Agent	A Diagnostics probe deployed on a host	Agent	Diagnostics	Diagnostics
HP Operations Agent	Key Attributes: 1. Name (data_name) - Core ID of the Operations Agent 2. Container (root_ container) - The container Host Expected attributes: 1. Application IP - The primary IP that is used to communicate with the Agent 2. Application Listening Port Number - The port number that is used to communicate with the Agent (default: 383)	Agent	OMi	OMi

Class name	Description	Superclass	Producers	Consumers
HP Operations Manager System	An Operations Manager i or Operations Manager for Windows, Linux, Solaris or HP-UX system. A HP Operations Manager system representing an OMi system is linked with OMi Gateway Server(s) and OMi Data Processing Server(s) and other Management Systems it integrates with.	Management System	OMi	OMi
Hypervisor	Base class for different kinds of hypervisors (software that allows to host virtual machines) Represents the virtualization service provided by the Hypervisor, its properties and health. The Hypervisor is the link object between the virtual machine (a Node) and the physical host (a Node).	RunningSoftware	OMi (MP Infra)	OMi
IBM MQ Alias Queue	An IBM Alias Queue is simply an alias of another queue. It may be an alias of a local, remote, transmission or another alias queue. The alias queue and the queue for which it	IBM MQ Queue	TV	TV

Class name	Description	Superclass	Producers	Consumers
	is an alias are within the same queue manager. Messages/commands issued on the alias queue are forwarded to the queue for which it is an alias.			
IBM MQ Cluster	An MQ Cluster provides a flexible approach to join multiple queue managers with minimal configuration. This allows multiple instances of the same service to be hosted through multiple queue managers which allows for higher performance, capacity and resiliency.	FailoverCluster	TV	TV
IBM MQ Local Queue	A Local Queue is a basic message queue and container of messages. An application can place a message in it for delivery or request/retrieve a message from it.	IBM MQ Queue	TV	TV
IBM MQ Queue	The IBM MQ Queue is a container of messages in the MQ Infrastructure and controls how messages are routed between queue managers. Queues may be setup in	MQ Queue	TV	TV

Class name	Description	Superclass	Producers	Consum ers
	several configurations to control message ordering and delivery (F/LIFO, message priority, sequential delivery, guaranteed delivery, etc.) and are optimized to carry small amounts of information.			
IBM MQ Queue Manager	A WebSphere MQ instance may have one or more queue managers. The queue manager is responsible for functions not directly related to data movement such as storage, timing, triggering, etc. Queue Managers use a proprietary IBM technology known as a "bindings" connection to communicate with MQ objects it manages and with remote clients via a network. Key Attributes: 1. Name (data_ name) - The name of the MQ Queue Manager 2. Container (root_ container) - The container IBM WebSphere MQ Software Element"	Message Queue Resource	TV	TV

Class name	Description	Superclass	Producers	Consumers
IBM MQ Remote Queue	A Remote Queue is a remote or proxy instance of another queue. It may be a remote instance for a local, remote, transmission or another alias queue. The remote queue and the queue for which it is a remote may be on different queue managers.	IBM MQ Queue	TV	TV
IBMWebSphereMQ	Represents IBM WebSphere MQSeries Software	MessagingServer	Diagnostics, TV	Diagnostics, TV
IIS Application Pool	IIS Application Pool	IIS Resource	Diagnostics, OMi (MP IIS)	Diagnostics, OMi
IIS FTP Server	IIS FTP Server	RunningSoftware	OMi(MP IIS)	OMi
IIS SMTP Server	IIS SMTP Server	RunningSoftware	OMi (MP IIS)	OMi
IIS Virtual Dir	IIS Virtual Dir	IIS Web Dir	Diagnostics	Diagnostics
IIS Web Dir	IIS Web Dir	IIS Resource	Diagnostics	Diagnostics
IIS Web Server	IIS Web Server	WebServer	SiS, Diagnostics, OMi (MP IIS)	SiS, Diagnostics, OMi
IIS Web Service	IIS Web Service	IIS Service	Diagnostics	Diagnostics
IIS Web Site	IIS Web Site	IIS Resource	Diagnostics, OMi (MP IIS)	Diagnostics, OMi
InfrastructureMaster	The infrastructure is responsible for updating references from objects in its domain to objects in other domains.	DomainControllerRole	OMi (MP AD)	OMi

Class name	Description	Superclass	Producers	Consumers
InfrastructureService	An IT Service that is not directly used by the Business, but is required by the IT Service Provider so they can provide other IT Services. For example Directory Services, naming services, or communication services. Infrastructure service is a synonym for technical service in ITILv3.	Service	SiS	SiS
Interface	Describes a logical interface (Note: This is NOT a physical interface card) that supports various data link layer and other higher layer protocols such as tunnels, mpls, frame, atm etc.	NodeElement	OMi, NNMi, Diagnostics, TV	OMi, Diagnostics, TV
IpAddress	This class represents the logical network identifier of a node on the network. An IP Address can represent either an IPv4 or an IPv6 address.	NetworkEntity	RUM, SiS, OMi, NNMi, Diagnostics, TV	RUM, SiS, OMi, Diagnostics, TV
IpServiceEndpoint	Represents any kind of a network service end point based on a variety of protocols such as UDP or TCP or more specific ones such as SMTP, SNMP etc. The	CommunicationEndpoint	RUM, SiS, Diagnostics, TV	RUM, SiS, Diagnostics, TV

Class name	Description	Superclass	Producers	Consumers
	class describes the IP address and network port a service end point is bound to and the type of protocol it uses to expose an end point.			
IpSubnet	This class represents an IP subnet in a network. The network could be an IPv4 or an IPv6 network. An instance of this class will exists for each IP subnet in a routing domain.	NetworkEntity		OMi
J2EE Application	J2EE application - is a deployable unit of J2EE functionality Key Attributes: 1. Name (data_ name) - A unique name that identifies application in the J2EE domain. 2. Container (root_ container) - The relevant J2EE Domain	J2EE Deployed Object	OMi (MP WebSphere, Weblogic, JBoss), Diagnostics, TV	OMi, Diagnostics, TV
J2EE Cluster	Cluster of Java EE Servers that provides high availability, scalability and fault tolerance services	Load Balancing Cluster	OMi (MP WebSphere, Weblogic, JBoss)	OMi
J2EE Domain	Management domain of Java EE resources (i.e. servers, clusters, application components, etc.)	ApplicationSystem	OMi (MP WebSphere, Weblogic, JBoss), Diagnostics, TV	OMi, Diagnostics, TV

Class name	Description	Superclass	Producers	Consumers
J2EE Server	The J2EE server identifies the server core of one instance of a J2EE platform product as described in the Java 2 Enterprise Edition Platform specification.	ApplicationServer	OMi (MP WebSphere, Weblogic, JBoss), Diagnostics, TV	OMi, Diagnostics, TV
JBoss AS	The Jboss Application Server	J2EE Server	OMi (MP JBoss), Diagnostics	Diagnostics
JDBC Data Source	Represents JDBC connector to data source. JDBC Data Source provides database connectivity through a pool of JDBC connections	Application Resource	OMi (MP WebSphere, Weblogic, JBoss)	OMi
JMS Destination	JMS destination	JMS Resource	TV	TV
JMS Server	JMS server	JMS Resource	TV	TV
JVM	Key Attributes: 1. Name (data_name) - JVM 2. Container (root_container) - The container Software Element	J2EE Managed Object	OMi (MP WebSphere, Weblogic, JBoss)	OMi
Layer2Connection	Represents a ISO Layer-2 connection between 2 or more interfaces.	NetworkEntity	NNMi	OMi
Logical Volume	A Logical Volume of a disk device	NodeElement	OMi (MP Infra)	OMi
Lync Pool	A Lync Server pool is a collection of Lync Servers. All Lync Servers in the pool run exactly the same services and one	Lync	OMi (MP Skype)	OMi

Class name	Description	Superclass	Producers	Consumers
	server in a pool of many can go down without detribalizing the pool. A pool is defined by a full qualified domain name.			
Lync Server	Microsoft Lync Server (previously Microsoft Office Communications Server) is an enterprise real-time communications server, providing the infrastructure for enterprise instant messaging, presence, file transfer, peer-to-peer and multiparty voice and video calling, ad hoc and structured conferences (audio, video and web) and PSTN connectivity.	Communication Server	OMi (MP Skype)	OMi
Lync Server Role	Lync Server 2010 allows for role based deployment. During Lync Server 2010 installation user can select for the components to be installed on a machine. The services installed on the Lync Server identify the role on the server.	Lync Resource	OMi (MP Skype)	OMi
Lync Site	A Lync Server site can be either a central site or a branch site. A central	Lync	OMi (MP Skype)	OMi

Class name	Description	Superclass	Producers	Consumers
	site contains at least one Front End pool or one Standard Edition server. A branch site is associated with exactly one central site, and the users at the branch site get most of their Lync Server functionality from the servers at the associated central site.			
Mainframe	Main computer which can serve many users	Computer	TV	TV
Mediation Server	Mediation Server is a necessary component for implementing Enterprise Voice and dial-in conferencing. Mediation Server translates signaling and, in some configurations, media between your internal Lync Server infrastructure and an Internet Protocol/Public Switched Telephone Network (IP-PSTN) gateway or a Session Initiation Protocol (SIP) trunk.	Lync Server Role	OMi (MP Skype)	OMi
MicrosoftExchangeServe r	This class represents Microsoft Exchange server software installed on some host.	MailServer	OMi (MP Exchange)	OMi
Monitoring Server	Monitoring Server collects data about	Lync Server Role	OMi (MP Skype)	OMi

Class name	Description	Superclass	Producers	Consumers
	the quality of your network media, in both Enterprise Voice calls and A/V conferences.			
MQ Queue	A Queue is a container of messages in the MQ Infrastructure	Message Queue Resource	Diagnostics	Diagnostics
MS Cluster	Microsoft cluster server provides a clustering technology that keeps server-based applications available, regardless of individual component failures	FailoverCluster	OMi (MP Infra)	OMi
MSSQL Database	SQL Data Base from Microsoft	Database Schema	OMi, (MP MSSQL) Diagnostics	Diagnostics
Net Device	The Net Device class represents a specific purpose machines such as Routers, Switches, Printers	Node	OMi	OMi
Node	The Node class represents a general purpose machine (i.e., computer). This also is a base class from which all the other classes representing devices such as virtual machines will inherit. Machines are typically reachable via the network but there are times when users model a	InfrastructureElement	OMi (MP Infra), RUM, SiS, NNMi, TV	RUM, SiS, OMi, TV

Class name	Description	Superclass	Producers	Consumers
	machine even when it is not reachable via the network. Examples of machines include UNIX/Windows systems, switches, routers, firewalls etc.			
NTCMD	xcmd or pstools	Shell	SiS	SiS
OMi Data Processing Server	An OMi server responsible for aggregating data and controlling the Run-time Service Model (RTSM) service within OMi.	Management Software	OMi	OMi
OMi Gateway Server	An OMi server that is responsible for running the OMi application, producing reports, operating the administration area, receiving data samples from the data collectors and distributing this data to the relevant OMi components.	Management Software	OMi	OMi
Oracle	Oracle database	Database	SiS, OMi (MP Oracle DB), Diagnostics	SiS, OMi, Diagnostics
Oracle iAS	The Oracle IAS Application Server	J2EE Server	Diagnostics	Diagnostics
Oracle RAC	Oracle Real Application Cluster (RAC), allows multiple computers to run the Oracle RDBMS software	Load Balancing Cluster	OMi (MP Oracle DB)	OMi

Class name	Description	Superclass	Producers	Consumers
	simultaneously while accessing a single database			
Persistant Chat Server	A Persistent Chat Server is required for multiparty, topic-based conversations that persist over time.	Lync Server Role	OMi (MP Skype)	OMi
PrimaryDomainController Master	The PDC emulator is a domain controller that advertises itself as the primary domain controller (PDC) to workstations, member servers, and domain controllers that are running earlier versions of Windows.	DomainControllerRole	OMi (MP AD)	OMi
Process	An instance of a program.	NodeElement	Diagnostics	Diagnostics
Physical Port			NNMi	OMi
Registrar Server	A registrar is a service that accepts register requests from Session Initiation Protocol (SIP) endpoints. Registrars then save the registration information into a location database.		OMi (MP Skype)	OMi
RelativeIDMaster	The RID master is responsible for processing RID pool requests from all domain controllers in a particular domain.	DomainControllerRole	OMi (MP AD)	OMi
Resource Pool	A generic Resource	Application Resource	OMi	OMi

Class name	Description	Superclass	Producers	Consumers
	Pool			
RunningSoftware	This class represents the runtime aspects of a software system that is currently running or intended to be running on a Node. An instance of the RunningSoftware class is the place for runtime overview information such as last- startup-time and application-instance-name. The rather static characteristics of an installed software are represented by the InstalledSoftware class.	InfrastructureElement	RUM, SiS, TV	RUM, SiS, TV
SAP ABAP Application Server	SAP's integrated software solution for client/server and distributed open systems.	SapApplicationServer	OMi (MP SAP), SiS, Diagnostics	SiS, Diagnostics
SAP J2EE Application Server	Represents an instance of the J2EE Application server	SapApplicationServer	OMi (MP SAP), Diagnostics	Diagnostics
SAPABAPCentralServices		SapApplicationServer	OMi (MP SAP)	OMi
SAPJ2EECentralServices		SapApplicationServer	OMi (MP SAP)	OMi
SAP System	A logical unit, grouping together SAP-related entities (and possibly other entities as well) into one homogenous SAP deployment	ApplicationSystem	OMi (MP SAP), SiS	OMi, SiS

Class name	Description	Superclass	Producers	Consumers
SAP Work Process	A logical single-instance representation of a certain type of work process	SAP Resource	OMi (MP SAP), SiS	OMi, SiS
SchemaMaster	The schema master domain controller controls all updates and modifications to the schema.	DomainControllerRole	OMi (MP AD)	OMi
Service Guard Cluster	A Service Guard Cluster	FailoverCluster	OMi	OMi
SharePoint Farm	A Microsoft SharePoint Server Farm	ApplicationSystem	OMi (MP SharePoint)	OMi
Microsoft SharePoint Server	A Microsoft SharePoint Server	RunningSoftware	OMi (MP SharePoint)	OMi
Siebel Application Server	An application running the business logic tier	ApplicationServer	SiS	OMi
Siebel Component	A process on the Siebel Application Server encapsulating some Siebel application functionality	Application Resource	SiS	OMi
Siebel Component Group	An application running on the Siebel application server.	Application Resource	SiS	SiS
Siebel Enterprise	A logical unit, which describes a group of servers that function together to build a full- blown Siebel toolset experience	ApplicationSystem	SiS	SiS
Siebel Gateway	A coordinating server, which routes requests to the correct component	ApplicationServer	SiS	SiS

Class name	Description	Superclass	Producers	Consumers
Siebel Web Application	A Siebel application's location on the web server	Application Resource	SiS	SiS
Siebel Web Server Extension	A server running the Web tier of Siebel	Application Resource	SiS	SiS
SiteScope Group	SiteScope Logical Group	Group	SiS	SiS
SiteScope Measurement	Represents a SiteScope measurement.	System Monitor	SiS	SiS
SiteScope Measurement Group	A group of measurements of the same type	Group	SiS	SiS
SiteScope Monitor	SiteScope Monitor	System Monitor	SiS	SiS
SiteScope Profile	SiteScope Profile	Group	SiS	SiS
SiteScope Profile Monitor	SiteScope Profile Monitor (Internal)	System Monitor	SiS	SiS
SiteScope Web Service Monitor	SiteScope Web Service Monitor	SiteScope Monitor	SiS	SiS
SQL Server	SQL server	Database	SiS, OMi (MP MSSQL, SharePoint), Diagnostics	SiS, OMi, Diagnostics
SSH	ssh agent	Shell	SiS	SiS
Sybase ACE	Sybase database	Database	OMi (MP Sybase)	OMi
Telnet	telnet	Shell	SiS	SiS
Unix	Host with Unix Operation system.	Computer	SiS, OMi, Diagnostics, TV	
Veritas Cluster	Veritas cluster server provides a clustering technology that keeps server-based	FailoverCluster	OMi	SiS, OMi, Diagnostics, TV

Class name	Description	Superclass	Producers	Consumers
	applications available, regardless of individual component failures			
Vertica	Vertica database	Database	OMi (MP Vertica)	OMi
Vertica Database Cluster	Vertica database cluster	ApplicationSystem	OMi (MP Vertica)	OMi
Virtual Management Software	Represents a Virtual Management Software	RunningSoftware	OMi	OMi
Virtualization Layer Software	Represents the thin software layer running on bare metal. It can represent a kernel of the ESX Server's hypervisor for Vmware virtualization solution or any other hypervisor for other vendors	Hypervisor	SiS, OMi, Diagnostics	SiS, OMi
VMware Cluster	VMware Cluster is a collection of ESX Server hosts with shared resources and a shared management interface. When you add a host to a cluster, the host's resources become part of the cluster's resources. The cluster manages the resources of all hosts	FailoverCluster	SiS, OMi	SiS, OMi
VMware ESX Server	VMware ESX Server is a computer that uses virtualization	Computer	SiS, OMi, Diagnostics	SiS, OMi

Class name	Description	Superclass	Producers	Consumers
	software. ESX Hosts provide CPU and memory resources, access to storage, and network connectivity to virtual machines that reside on them			
VMware Resource Pool	VMware Resource Pool represents a pool where Virtual machines execute in, and draw their resources from	Resource Pool	SiS, OMi	SiS, OMi
Web Service	Represent a web service	WebService Resource	SiS, Diagnostics	SiS, Diagnostics
Web Service Operation	Web Service Operation	WebService Resource	SiS, Diagnostics	SiS, Diagnostics
Weblogic AS	The Weblogic Application Server	J2EE Server	SiS, OMi (MP Weblogic), Diagnostics, TV	SiS, OMi, Diagnostics, TV
WebServer	A software that accepts http requests and delivers as a response web pages. WebServers allow web-clients to access the pages and resources of web-applications. Examples: 'Apache web Server' , 'IIS'.	RunningSoftware	SiS	SiS
Web Server Role	A Microsoft SharePoint Server that acts as Web Server	SharePoint Server Role	OMi (MP SharePoint)	OMi

Class name	Description	Superclass	Producers	Consumers
Websphere AS	The Websphere Application Server	J2EE Server	SiS, OMi (MP WebSphere), Diagnostics, TV	SiS, OMi, Diagnostics, TV
Web Server Virtual Host	Virtual host on a web server	Application Resource	OMi (MP Apache)	OMi
Windows	Host with Microsoft Operation system (NT).	Computer	SiS, OMi, Diagnostics, TV	SiS, OMi, Diagnostics, TV
Windows Service	A Windows background process	NodeElement	OMi (MP MSSQL)	OMi

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