Hewlett Packard
Enterprise

HPE Operations Bridge Reporter

Software Version: 10.00
Windows® and Linux operating systems

Microsoft SQL Server Content Pack Reference

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About This Document

This document provides an overview of HPE OBR and Microsoft SQL Server Content Pack, This document also provides the list of Microsoft SQL Server reports available with the Microsoft SQL Server Content Pack. The document also lists the prerequisite aspects and policies required for HPE Operations Bridge Reporter (OBR) to integrate with HP Operations Smart Plug-ins (SPIs) and HP OMi Management Packs.

This document helps you to deploy the topology views and install and configure the data source for the Microsoft SQL Server Content Pack. It provides information on report navigation, metric mapping for report and calculate instance availability.

Getting Started

This section provides HPE OBR overview, deployment scenarios, and types of reports.

HPE Operations Bridge Reporter (OBR) Overview

HPE OBR is a cross-domain historical infrastructure performance reporting solution. It displays top-down reports from Business Service Management (BSM) Business Service and Business Application, HP Operations Manager (HPOM) Node Group or HP OMi10 perspective to the underlying infrastructure. It also displays bottoms-up reports from the infrastructure to the impacted Business Services and Business Applications or Node Groups. It leverages the topology information to show how the underlying infrastructure health, performance and availability affects your Business Services and Business Applications or Node Groups in the long term. You can navigate from higher level cross domain reports to detailed domain level reports.

Deployment Scenarios

Following are the deployment scenarios supported on HPE OBR:

- **Deployment with BSM/OMi** - In this deployment, Run-time Service Model (RTSM) is the source of topology information. HPE OBR discovers and synchronizes topology information from OMi. In a BSM environment with underlying HPOM servers, this synchronization technique receives discovered topology data from multiple HPOM systems and updates the Configuration Items (CIs) and CI relationships in the RTSM as soon as changes are discovered. However, you can also use the HPOM D-MoM dynamic topology synchronization technique to discover and synchronize the topology information in RTSM. In an environment with OMi 10.00, HPE OBR uses RTSM to obtain topology information and metrics from HP Operations Agent or HP SiteScope systems that are configured with OMi.

- **Deployment with HP Operations Manager** - In this deployment, the topology information is a group of managed nodes defined in HPOM that are logically combined for operational monitoring. These logical node groups are created by HPOM users to classify the nodes as specific organizations or entities within their enterprise. For example, a group called `Exchange Servers` can be created in HPOM to organize the specific Exchange Servers and Active Directory nodes for reporting or monitoring purposes. HPE OBR uses the node groups from HPOM for its topology computation.

- **Deployment with VMware vCenter** - VMware vCenter is a distributed server-client software solution that provides a central and a flexible platform for managing the virtual infrastructure in business-critical enterprise systems. VMware vCenter centrally monitors performance and events, and provides an enhanced level of visibility of the virtual environment, thus helping IT administrators to control the environment with ease.
- **Other deployments** - Apart from the basic deployment scenarios, you can collect data from the following sources independently:
  - Deployment with NNMi
  - Deployment with a generic database
  - Deployment with other applications using CSV

Types of Reports

The reports available in HPE Operations Bridge Reporter (OBR) are divided into two broad categories:

• Business Service Management

• Infrastructure Management

The following image shows the supported list of reports folders under both these categories:
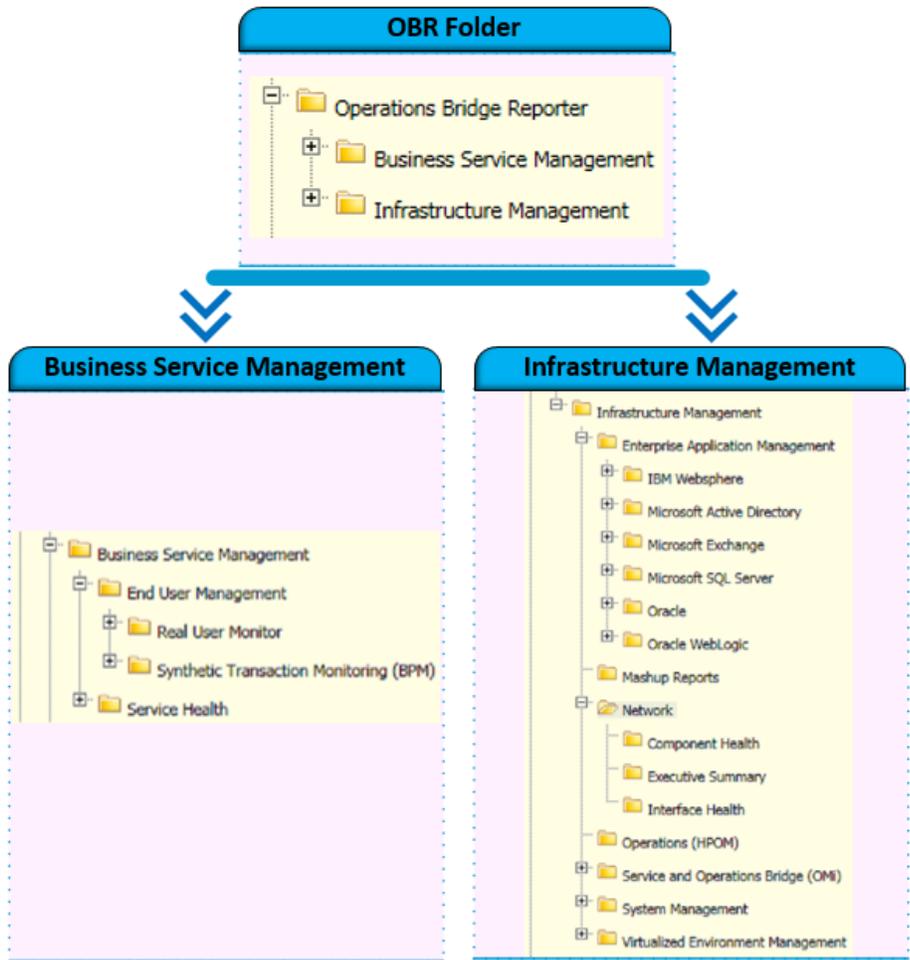
To view a map of all the reports available in the Microsoft SQL Server Content Pack, see Report Navigation.

For more information on HPE Operations Bridge Reporter concepts, see *HPE Operations Bridge Reporter Concepts Guide* and *HPE Operations Bridge Reporter Content Development Guide*.

Microsoft SQL Server Content Pack Overview

This section provides an overview of Microsoft SQL Server Content Pack, target audience, and supported data sources.

The Microsoft SQL Server Content Packs determine the fact data that are to be collected from the various data sources, and the interval at which the data is collected. Configuration of the data source connections for the Microsoft SQL Server Content Packs depends on the type of deployment scenario used.

Target Audience

Target audience for MS SQL Server reports are Operations Center Managers and Database Administrators, who help to setup and maintain the database systems in the IT infrastructure. MS SQL Server reports help to identify and analyze the best and worst performing database servers and instances, in a specific period, based on availability, space usage, and I/O metrics. These instances and metrics help users to optimize the database parameters and appropriately consolidate the applications.

Data Sources for Microsoft SQL Server Data

OBR integrates with and collects historical and ongoing database performance metrics from the HP Operations Smart Plug-In and HP OMi Management Pack for Microsoft SQL Server datastores in both BSM Run-time Service Model (RTSM) and HP Operations Manager (HPOM) deployment scenarios.

The **Microsoft SQL Server Content Pack** identifies the list of metrics or facts that OBR must collect from each of these data sources. The corresponding dimension data is collected from the RTSM or HPOM topology source, depending on OBR's deployment scenario.

OBR collects data from different data sources at periodic intervals based on the collection policies predefined in the **MicrosoftSQLServer_ETL_DBSPI Content Pack**. From each data source, summarized fact data is collected at a 5-minute interval. This fact data is called rate data and is stored in the database in rate tables as individual records. Therefore, for a 60-minute interval, there are 12 in the tables. OBR then performs aggregation routines on these records and converts the data to hourly and daily data. This aggregated data is displayed in the reports along with monthly and yearly aggregates that are derived by online aggregation.

Integrating with Data Sources for HP Operations Smart Plug-ins

To show reports on the data collected from Microsoft SQL Server, OBR relies on the metrics collected by collectors of HP Operations Smart Plug-ins for Microsoft SQL Server (SQL Server SPI). SPI collectors store the data into the data store provided by the HP Operations agent. OBR's integration with SPI data sources facilitate transfer of data from HP Operations agent's data store to OBR's database. This integration is established when you deploy OBR in the HPOM deployment scenario.

OBR provides performance reports for the Microsoft SQL Server enterprise applications.

Prerequisite

The following is the prerequisite to integrate with data source for HP Operations Smart Plug-ins:

- CODA logging is a prerequisite for HPE OBR to be able to collect data from multiple instances.

Working of the Integration

1. Installation and configuration of the SPI ensures that necessary instrumentation, scripts, programs, and policies are transferred to a node where the application is running and the HP Operations agent is already installed.

   Tip: For successful installation and configuration of SQL Server SPI, see the SPI documentation.

2. SPI collectors start collecting data on the node based on rules and specifications available with the policies deployed on the node.
3. SPI stores the collected data into HP Operations agent's data store. The SPI creates at least one *data source* in agent's data store.
4. After configuring OBR to collect data from a data source and installing Microsoft SQL Server, OBR starts collecting historical data from agent's data store.

Prerequisite Policies for Microsoft SQL Server Reports

The following table lists the Microsoft SQL Server SPI policies required by each Microsoft SQL Server report.

Note: See the SPI documentation for information on how the policies should be deployed and what additional configuration steps may be required.

Note: Policy Configuration Requirement is not required; deploy the policy with default settings.

Report Name	Data Source	Data Class	SPI Policy
MSSQL Database and Virtual Device Space Usage Top N	DBSPI_ MSS_ REPORT	DBSPI_ MSS_ REPORT	- Scheduled task policy - DBSPI-MSS-1d-Reporter - Measurement threshold Policy - M240_DBSize - DBSPI-MSS-1h
MSSQL Performance Summary	DBSPI_ MSS_ GRAPH	DBSPI_ MSS_ GRAPH	- Scheduled task policy - DBSPI-MSS-1d-Reporter - DBSPI-MSS-05min - Measurement threshold Policy - DBSPI-3001 - DBSPI-3025 - DBSPI-3013 - DBSPI-3009 - DBSPI-3008
MSSQL Table Space Usage Top N	DBSPI_ MSS_ GRAPH	DBSPI_ MSS_ GRAPH	- Scheduled task policy - DBSPI-MSS-1d-Reporter - Measurement threshold Policy - M241_

Report Name	Data Source	Data Class	SPI Policy
			TableSize

MSSQL Database Input and Output Statistics	DBSPI_ MSS_ GRAPH	DBSPI_ MSS_ GRAPH	• Scheduled task policy
			  • DBSPI-MSS-1h
			• Measurement threshold Policy
			  • DBSPI-3007
			  • DBSPI-3008

MSSQL Database Locks Summary	DBSPI_ MSS_ GRAPH	DBSPI_ MSS_ GRAPH	• Scheduled task policy
			  • DBSPI-MSS-1h
			  • DBSPI-MSS-05min
			• Measurement threshold Policy
			  • DBSPI-3013
			  • DBSPI-3071
			  • DBSPI-3070
			  • DBSPI-3072
			  • DBSPI-3075

MSSQL Database Performance Summary	DBSPI_ MSS_ GRAPH	DBSPI_ MSS_ GRAPH	• Scheduled task policy
			  • DBSPI-MSS-1h
			• Measurement threshold Policy
			  • DBSPI-3023
			  • DBSPI-3024
			  • DBSPI-3053

Report Name	Data Source	Data Class	SPI Policy
			• DBSPI-3054 • DBSPI-3051 • DBSPI-3052

MSSQL Database Space Usage Details	DBSPI_MSS_REPORT	DBSPI_MSS_REPORT	• Scheduled task policy
			  • DBSPI-MSS-1d-Reporter
			
			• Measurement threshold Policy
			  • M240_DBSize

MSSQL Database Table Space Usage Details	DBSPI_MSS_REPORT	DBSPI_MSS_REPORT	• Scheduled task policy
			  • DBSPI-MSS-1d-Reporter
			
			• Measurement threshold Policy
			  • M241_DBSize

MSSQL Instance Availability Details	DBSPI_MSS_REPORT	DBSPI_MSS_REPORT	• Scheduled task policy • DBSPI-MSS-05min-Reporter

MSSQL Server Transaction Summary	DBSPI_MSS_GRAPH	DBSPI_MSS_GRAPH	• Scheduled task policy
			  • DBSPI-MSS-1h
			
			• Measurement threshold Policy
			  • DBSPI-3064
			
			  • DBSPI-3066
			
			  • DBSPI-3067

Report Name	Data Source	Data Class	SPI Policy
MSSQL Users Connection Summary	DBSPI_ MSS_ GRAPH	DBSPI_ MSS_ GRAPH	- Scheduled task policy - DBSPI-MSS-1h - Measurement threshold Policy - M031_ NumUsersCnt - DBSPI-3032 - DBSPI-3026
MSSQL Virtual Device Space Usage Details	DBSPI_ MSS_ REPORT	DBSPI_ MSS_ REPORT	- Scheduled task policy - DBSPI-MSS-1d-Reporter - Measurement threshold Policy - M240_DBSize - DBSPI-MSS-1h
MSSQL Instance Availability	DBSPI_ MSS_ REPORT	DBSPI_ MSS_ REPORT	- Scheduled task policy - DBSPI-MSS-05min-Reporter

Integrating with Data Sources for HP OMi Management Packs

To show reports on the data collected from Microsoft SQL Server, OBR relies on the metrics collected by HP OMi Management Pack. The HP OMi Management Pack collectors store the data into the data store provided by the HP Operations agent. OBR's integration with HP OMi Management Pack data sources facilitates transfer of data from HP Operations agent's data store to OBR's database. This integration is established when you deploy OBR views in the RTSM deployment scenario.

OBR provides performance reports for the Microsoft SQL Server enterprise application.

Working of the Integration

1. Installation and configuration of HP OMi Management Pack ensures that necessary instrumentation, scripts, programs, and policies are transferred to a node where the application is running and the HP Operations agent is already installed.

   Tip: For successful installation and configuration of HP OMi Management Packs, see the *HP Operations Manager i Management Pack* documentation.

2. HP OMi Management Pack collectors start collecting data on the node based on rules and specifications available with the policies deployed on the node.

3. HP OMi Management Pack stores the collected data into HP Operations agent's data store. HP OMi Management Pack creates at least one *data source* in agent's data store.

4. After configuring OBR to collect data from a data source and installing Content Packs, OBR starts collecting historical data from agent's data store.

Prerequisite Policies for Microsoft SQL Server Reports

The following table lists the OMi MP for Microsoft SQL Server policies and aspects required for each Microsoft SQL Server report.

Note: See the OMi MP documentation for information on how the policies should be deployed and what additional configuration steps may be required.

For OMi MP for Microsoft SQL Server, Data Source Name is same as Data Class Name.

Report Name	Aspect Name	Policy Templates in Aspect	HP Operations agent
			Data Source Name
MSSQL Database and Virtual Device Space Usage Top N	Microsoft SQL Server Space	MSSQLServer_ 3242 MSSQLServer_ 3240	DBSPI_ MSS_ REPORT
MSSQL Performance Summary	Microsoft SQL Server Processes and Statistics	MSSQLServer_ 3001 MSSQLServer_	DBSPI_ MSS_ GRAPH

Report Name	Aspect Name	Policy Templates in Aspect	HP Operations agent
			Data Source Name
		3025	
	Microsoft SQL Server Locks	MSSQLServer_ 3013	
	Microsoft SQL Server Transactions	MSSQLServer_ 3009	
	Microsoft SQL Server Input and Output Utilization	MSSQLServer_ 3008	
MSSQL Table Space Usage Top N	Microsoft SQL Server Space	MSSQLServer_ 3241	DBSPI_ MSS_ REPORT
MSSQL Database Input and Output Statistics	Microsoft SQL Server Input and Output Utilization	MSSQLServer_ 3007 MSSQLServer_ 3008	DBSPI_ MSS_ GRAPH
MSSQL Database Locks Summary	Microsoft SQL Server Locks	MSSQLServer_ 3071 MSSQLServer_ 3013 MSSQLServer_ 3070 MSSQLServer_ 3072 MSSQLServer_ 3075	DBSPI_ MSS_ GRAPH
MSSQL Database Performance Summary	Microsoft SQL Server Error	MSSQLServer_ 3023 MSSQLServer_	DBSPI_ MSS_ GRAPH

Report Name	Aspect Name	Policy Templates in Aspect	HP Operations agent
			Data Source Name
		3024	
	Microsoft SQL Server Data Access Methods	MSSQLServer_ 3053 MSSQLServer_ 3054 MSSQLServer_ 3051 MSSQLServer_ 3052	DBSPI_ MSS_ GRAPH
MSSQL Database Space Usage Details	Microsoft SQL Server Space	MSSQLServer_ 3240	DBSPI_ MSS_ REPORT
MSSQL Database Table Space Usage Details	Microsoft SQL Server Space	MSSQLServer_ 3241	DBSPI_ MSS_ REPORT
MSSQL Instance Availability Details	Microsoft SQL Server Availability	MSSQLServer_ 3243	DBSPI_ MSS_ REPORT
MSSQL Server Transaction Summary	Microsoft SQL Server Transactions	MSSQLServer_ 3064 MSSQLServer_ 3066 MSSQLServer_ 3067	DBSPI_ MSS_ GRAPH
MSSQL Users Connection Summary	Microsoft SQL Server Processes and Statistics	MSSQLServer_ 3032 MSSQLServer_ 3026	DBSPI_ MSS_ GRAPH

Report Name	Aspect Name	Policy Templates in Aspect	HP Operations agent
			Data Source Name
MSSQL Virtual Device Space Usage Details	Microsoft SQL Server Space	MSSQLServer_ 3242	DBSPI_ MSS_ REPORT
MSSQL Virtual Device Space Usage Details	Microsoft SQL Server Space	MSSQLServer_ 3242 MSSQLServer_ 3240	DBSPI_ MSS_ REPORT
MSSQL Instance Availability	Microsoft SQL Server Availability	MSSQLServer_ 3243	DBSPI_ MSS_ REPORT

Note: M031_NumUsersCnt is not available in the SQL list.

Deploy Topology Views

To configure HPE OBR to collect domain-specific data, you need to deploy the topology views for Microsoft SQL Server Content Pack. These topology views contain specific CI attributes that Microsoft SQL Server Content Pack uses to collect the relevant data.

> **Note:** The following deployment of topology views in HP BSM server is applicable only if the topology source is RTSM.

List of Content Pack and Topology Views to Deploy

The following table lists the topology views to deploy for Microsoft SQL Server Content Pack:

Content Pack	View Name	Location
On Windows		

Microsoft SQL Server	`SHR_DBMSSQL_ Views.zip`
	
	`SHR_DBMSSQL_ OM.zip`
		`%PMDB_ HOME%\packages\DatabaseMSSQL\ETL_ DBMSSQL_DBSPI.ap\source\cmdb_ views`

On Linux		

Microsoft SQL Server	`SHR_DBMSSQL_ Views.zip`
	
	`SHR_DBMSSQL_ OM.zip`
		`$PMDB_ HOME/packages/DatabaseMSSQL/ETL_ DBMSSQL_DBSPI.ap/source/cmdb_ views`

HP BSM Server

To deploy the topology model views for the Microsoft SQL Server Content Pack in the HP BSM server, follow these steps:

1. In the web browser, type the following URL:

   `http://<BSM system FQDN>/bsm`

   where, `<BSM system FQDN>` is the FQDN of the HP BSM server.

> **Note:** You can launch the HP BSM server from a system where HPE OBR is installed or any other local system. If you are launching from local system, ensure that you browse to the location mentioned in List of Content Pack and Topology Views to Deploy and copy the required views to your local system.

The Business Service Management Login page appears.

2. Type the login name and password and click **Log In**. The Business Service Management - Site Map appears.

3. Click **Administration > RTSM Administration**. The RTSM Administration page appears.
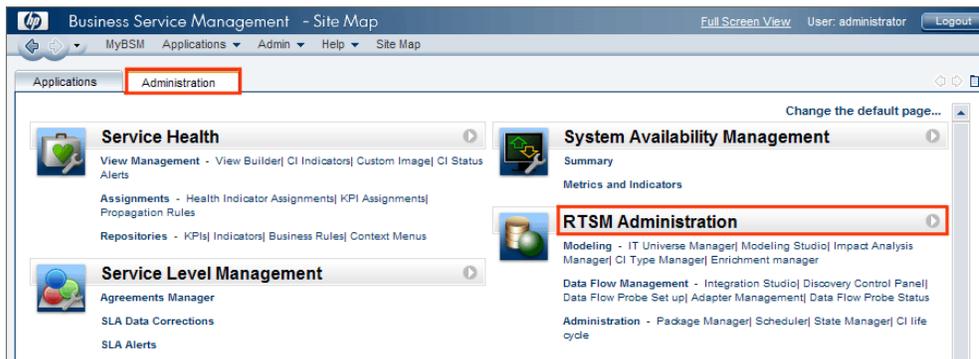
4. Click **Administration > Package Manager**. The Package Manager page appears.

5. Click the **Deploy Packages to Server (from local disk)** icon. The **Deploy Package to Server** dialog box appears.

6. Click the **Add** icon.

The **Deploy Package to Server (from local disk)** dialog box appears.

7. Browse to the location of the Content Pack zip files, select the required files, and then click **Open**.

You can view and select the TQL and ODB views that you want to deploy under **Select the resources you want to deploy** in the **Deploy Package to Server (from local disk)** dialog box. Ensure that all the files are selected.

8. Click **Deploy** to deploy the Content Pack views.

You have successfully deployed the Content Packs views based on the type of deployment scenario selected for HPE OBR.

Deploy Topology Views in HP OMi 10 Server

To deploy the topology model views for the Microsoft SQL Server Content Pack in the HP OMi 10 server, follow these steps:

1. In the web browser, type the following URL:

   `http://<OMi system FQDN>/omi`

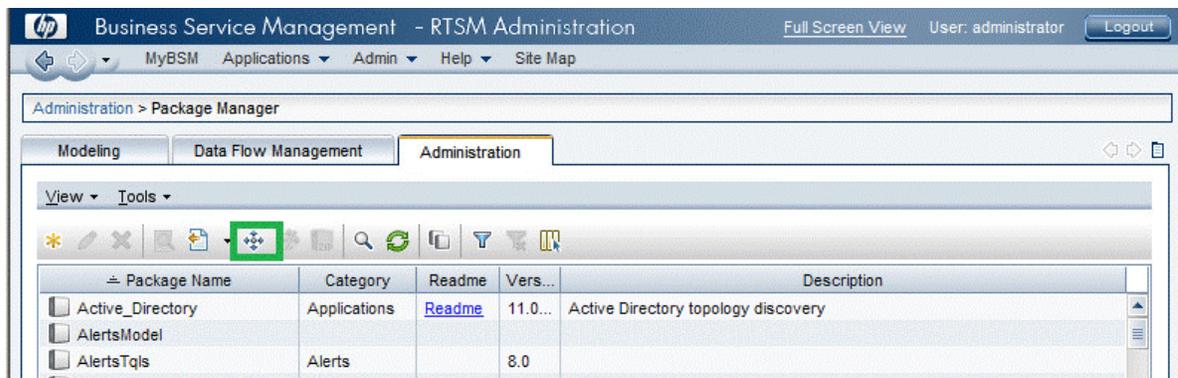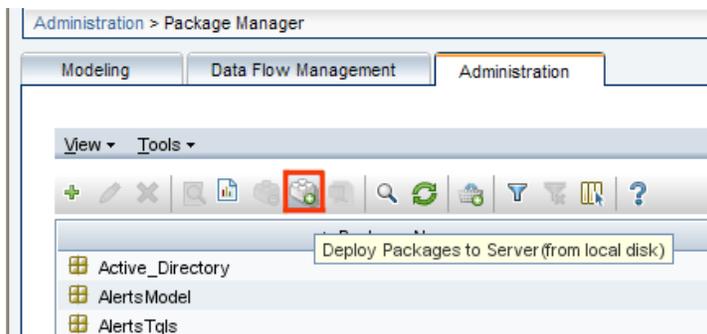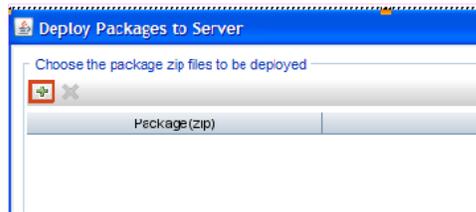   where, `<OMi system FQDN>` is the FQDN of the HP OMi server.

   > **Note:** You can launch the HP OMi server from a system where HPE OBR is installed or any other local system. If you are launching from local system, ensure that you browse to the location mentioned in List of Content Pack and Topology Views to Deploy and copy the required views to your local system.

   The Operations Manager i Login page appears.

2. Type the login name and password and click **Log In**. The Operations Manager i Workspace page appears.

3. Click **Administration > RTSM Administration > Package Manager**.
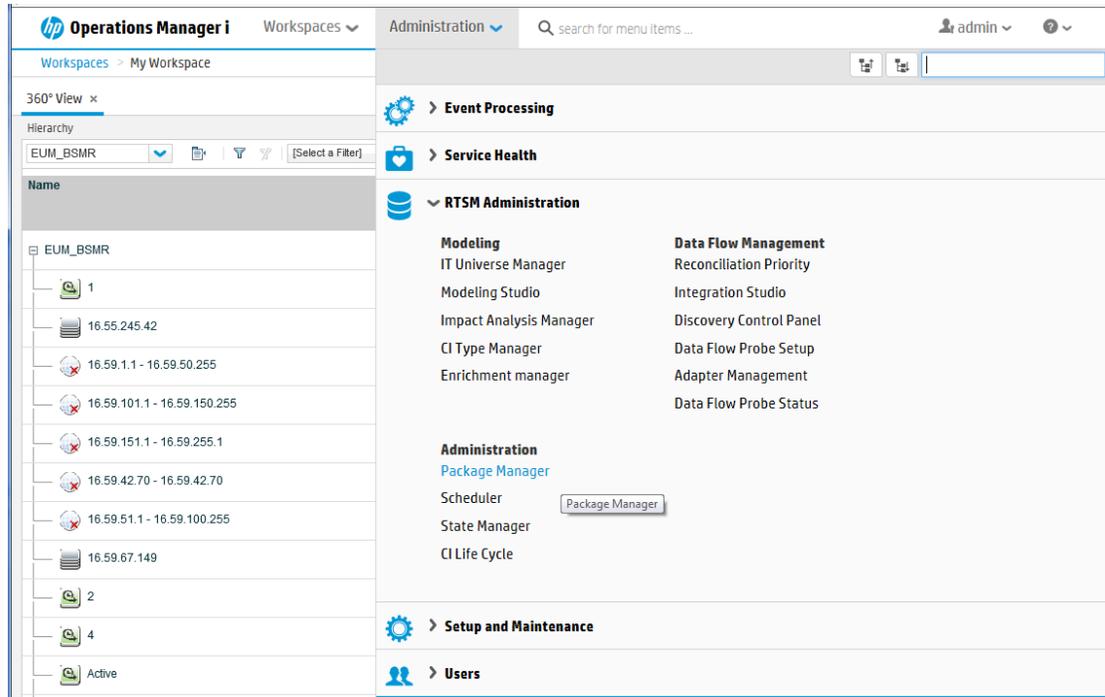
The Package Manager page appears.

4. Click the **Deploy Packages to Server (from local disk)** icon. The **Deploy Package to Server** dialog box appears.
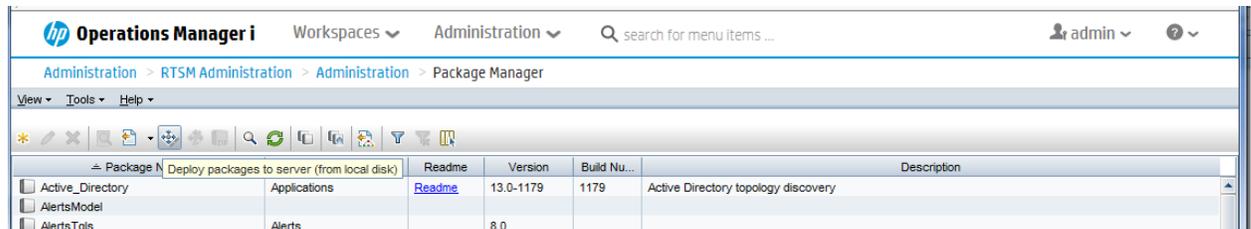
5. Click the **Add** icon.
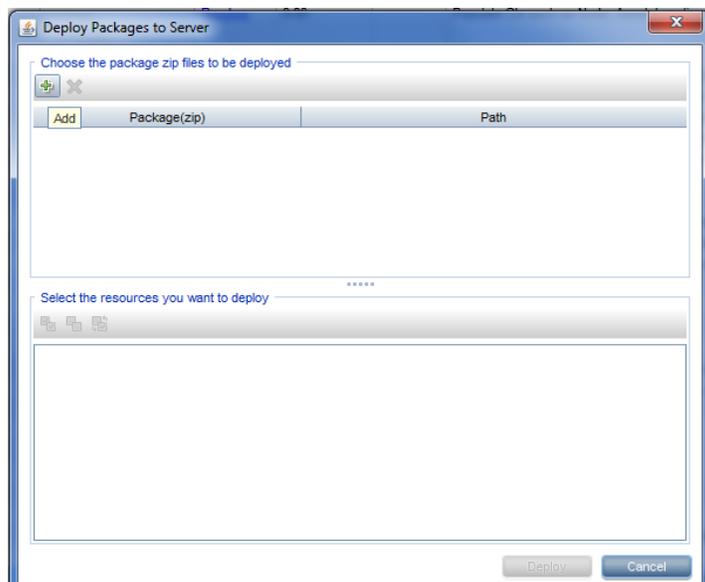
The **Deploy Package to Server (from local disk)** dialog box appears.

6. Browse to the location of the Content Pack zip files, select the required files, and then click **Open**.

   You can view and select the TQL and ODB views that you want to deploy under **Select the resources you want to deploy** in the **Deploy Package to Server (from local disk)** dialog box. Ensure that all the files are selected.

7. Click **Deploy** to deploy the Content Pack views.

You have successfully deployed the Content Packs views based on the type of deployment scenario selected for HPE OBR.

Install the Content Pack

Before you begin to install the Content Packs, check the availability and integrity of the data sources.

Check Availability and Integrity of Data Sources

OBR enables you to check the availability and integrity of data sources prior to installing Content Packs.

1. Launch the following page:

   `http://<OBR Server FQDN>:<port>/BSMRApp/dscheck.jsf`

2. To check the data sources related to RTSM, click **RTSM**.

   Click **View** to see the results. Results include the list of missing mandatory CI types and attributes.

3. To check the data sources in the HP Operations agent, click **PA**.

   Click **View** to see the results. Results include a status summary of nodes and missing policies.

Selecting the Content Pack Components

A typical Content Pack consists of three components - the Domain, Extraction Transformation Loading (ETL), and Application components.

The following figure shows the typical data flow between the components of the Content Pack:
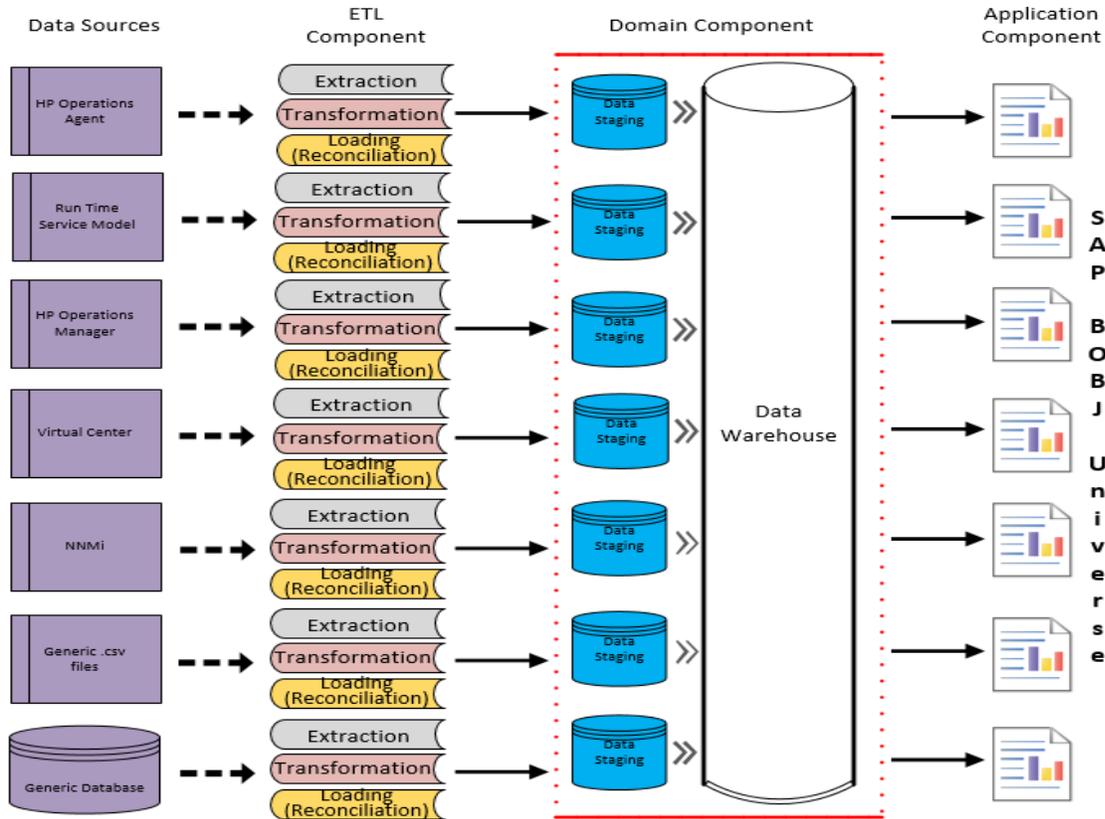
- **Domain component**: The Domain or Core Domain component defines the data model for a particular Content Pack. It contains the rules for generating the relational schema. It also contains the data processing rules, including a set of standard pre-aggregation rules, for processing data into the database. The Domain component can include the commonly-used dimensions and cubes, which can be leveraged by one or more Report Content Pack components. The Domain Content Pack component does not depend on the configured topology source or the data source from where you want to collect data.

- **ETL (Extract, Transform, and Load) component**: The ETL Content Pack component defines the collection policies and the transformation, reconciliation, and staging rules. It also provides the data processing rules that define the order of execution of the data processing steps.

  A single data source app.lication can have multiple ETL components. For example, you can have one ETL component for each virtualization technology supported in Performance Agent such as Oracle Solaris Zones, VMware, IBM LPAR, and Microsoft HyperV. The ETL component can be dependent on one or more Domain components. In addition, you can have multiple ETL components feeding data into the same Domain component.

  The ETL Content Pack component is data source dependent. Therefore, for a particular domain, each data source application has a separate ETL Content Pack

component. For example, if you want to collect system performance data from the HP Operations Agent, you must install the `SysPerf_ETL_PerformanceAgent` component. If you want to collect system performance data from HP SiteScope, you must install either `SysPerf_ETL_SiS_API` (sourcing data logged in API) or `SysPerf_ ETL_SiS_DB` (sourcing data logged in BSM Profile database).

- **Application component**: The Application Content Pack component defines the application-specific aggregation rules, business views, SAP BOBJ universes, and the reports for a particular domain. Report components can be dependent on one or more Domain components. This component also provides the flexibility to extend the data model that is defined in one or more Domain components.

The list of Content Pack components that you can install depends on the topology source that you configured during the post-install configuration phase of the installation. Once the topology source is configured, the Deployment Manager filters the list of Content Pack components to display only those components that can be installed in the supported deployment scenario. For example, if RTSM is the configured topology source, the Deployment Manager only displays those components that can be installed in the SaOB and APM deployment scenarios.

Install the Content Pack in Deployment Manager

To install the required Microsoft SQL Server Content Pack, follow these steps:

1. Launch the Administration Console in a web browser using the following URL:

   `http://<OBR_Server_FQDN>:21411`

2. In the Administration Console, click **Administration > Deployment Manager**. The Deployment Manager page is displayed.

   If you are installing this Content Pack to generate reports on data from HPOM, BSM, or OMi, select the following and click Install/Upgrade:

   To install this Content Pack and to generate reports on data from HPOM, BSM, or OMi, make the following selections:

   - MicrosoftSQLServer_ETL_DBSPI (10.00.000)

   - MicrosoftSQLServer_Domain (10.00.000)

   - MicrosoftSQLServer_Reports (10.00.000)

   > **Tip:** Install the following dependent Content Packs (and their components) along with this Content Pack for it to function:

- Core
  - Core_Domain

- System Performance
  - SysPerf_Domain

Note: The dependent domain content pack get selected automatically, you have to select only the ETLs based on the topology source.

Note: For more details on ETLs, see *HPE Operations Bridge Reporter Content Pack Release Notes*.

3. Click **Install/Upgrade** to install the Content Packs.
   The color of the status column changes for all the selected Content Packs. An `Installation Started` status appears in the **Status** column for Content Pack that is currently being installed. The Deployment Manager page automatically refreshes itself to display the updated status. Once the installation completes, an `Installation Successful` status appears. If the installation fails, an `Installation Failed` status appears.

   Note: The timer service will be stopped automatically during install/uninstall/upgrade operation and will be started once operation is complete.

4. Click the link in the **Status** column for more information about the installation process.
   The Content Pack Component Status History window is displayed. It displays the details of the current and historical status of that Content Pack component's installation.

Note: During install/uninstall process, Deployment Manager does not allow you to interrupt the process. Instead, you must wait till the current process is complete before you can perform any other operations on the Deployment Manager page.

Data Source Collection Configuration

After installing Content Packs, you must configure HPE OBR to collect required data from various data collectors. The data collectors work internally within the HPE OBR infrastructure to collect the data. Therefore, you cannot directly interface with these collectors. Instead, you can specify the data sources from where the collectors can collect the data through the Administration Console.

Configuring the HP Operations Agent Data Source

In the RTSM deployment scenario, you do not have to create new HP Operations Agent data source connections. Because, by default, all the nodes on which HP Operations Agent is installed are automatically discovered when the topology information is collected. These data sources or nodes are listed in the HP Operations Agent Data Source page of the Administration Console.

To view the list of HP Operations Agent data sources, follow these steps:

1. In the **Administration Console**, click **Data Source Configuration > HP Operations Agent**. The **HP Operations Agent Data Source** page appears.
2. To view detailed information about the HP Operations Agent data sources, click the Domain name or the number in the **HP Operations Agent Data Source Summary** table. The **HP Operations Agent Data Source Details** table appears.
3. To change the data collection schedule for one or more hosts, specify a polling time between 1 and 24 hours in the **Hrs** box in the **Schedule Polling Frequency** column.
4. Click **Save** to save the changes. A Saved Successfully message appears in the Information message panel.

Report Navigation

The Microsoft SQL Server reports are categorized into high-level Executive Summary and detailed Performance reports. You can navigate from the higher-level reports to the detailed reports through the various cross launch and hyperlink features. For example, you may start with the MS-SQL Performance Summary for an overall summary of the database performance and then navigate to the detailed reports for specific information.

The Microsoft SQL Server reports display performance, health, and resource requirement information for the following:

- SQL Server databases available in your environment
- Instances running on these database servers

  These reports also help to analyze the database performance impact in the context of an associated Business Service, Business Application, or a Group.

New Microsoft SQL Server Content Pack Report

The following is the new Microsoft SQL Server report:

- **MSSQL Instance Availability** - Provides information about the availability of the database instances that are running on selected node over a period of time. Displays the availability details of Microsoft SQL instances, as a heat-map based on predetermined thresholds, for every hour across the selected time period.

  Note: This availability report presents the instance availability information for the application. This report should not to be used for uptime calculation.

Availability	Color
< 90	
> 90 and < 95	
> 95	
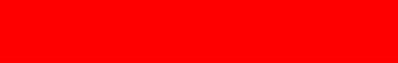
Report Navigation

Report navigation can vary depending on the use-cases around which these reports are designed. The following diagram shows a way to navigate the reports:
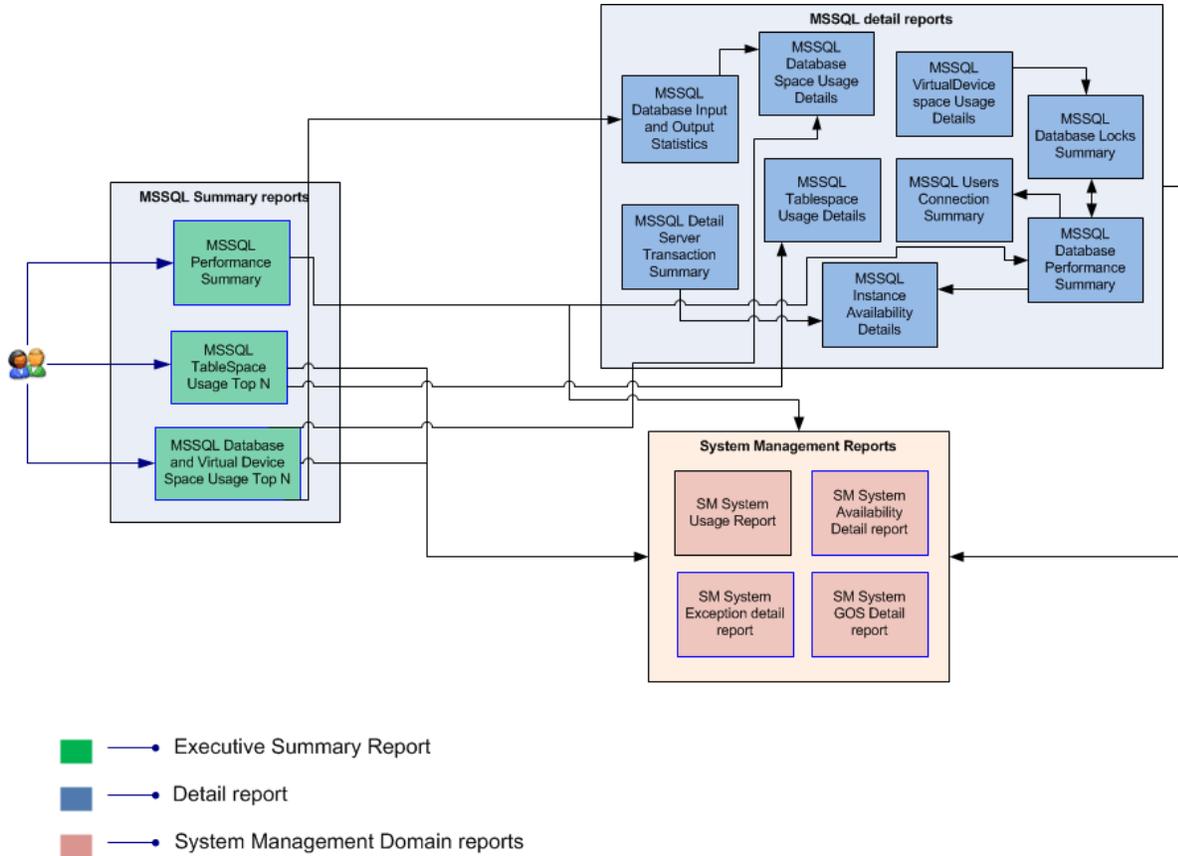
Use Cases

This section provides information on use cases for Microsoft SQL Server reports. The following table provides description, user, and report name for the use cases:

Description	User	Report Name
To view the performance metrics of the MSSQL instances in a node with the resource utilization at the node level	Executive Summary	MSSQL Performance Summary
To view the top N tables based on the space used for the selected database instance and database	Executive Summary	MSSQL Table Space Usage Top N
To view the top N databases and virtual devices based on the space used among the various intances of a selected node	Executive Summary	MSSQL Database and Virtual Device Space Usage Top N

Description	User	Report Name
To view the average outstanding read and write rate for each of selected database instance	Performance	MSSQL Database Input and Output Statistics
To correlate the number of transactions against the growth of logs for each of the selected database instance	Performance	MSSQL Detail Server Transaction Summary
To view the trend space used by all the databases over a period of time for each of the selected database instances	Performance	MSSQL Database Space Usage Details
To view the trend of space used by all the tables over a period of time for each of the selected databases in a given instance	Performance	MSSQL Database Table Space Usage Details
To view the trend of space used by all virtual device over a period of time for each of the selected database instance	Performance	MSSQL Virtual Device Space Usage Details
To view the total number of users connected over a period of time for each of the selected database instance	Performance	MSSQL Users Connection Summary
To view the details of locks over a period of time for each of the selected database instance	Performance	MSSQL Database Locks Summary
To view the input/output performance details over a period of time for each of the selected database instance	Performance	MSSQL Database Performance Summary
To view the availability over a period of time for each of the selected database instance	Performance	MSSQL Instance Availability Details

Appendix

This section provides information on Terminology, Calculating Microsoft SQL Server Instance Availability, and Metric Mapping for Reports.

Appendix A: Terminology

Table Space usage

- **Space Allocated (MB)**: Total space, in megabytes (MB), allocated for a database table
- **Free Space (MB)**: Total space, in MB, within a database table that is currently unallocated
- **Space Used (MB)**: Total amount of space, in MB, used by a database table
- **Free Space (%)**: Percentage of free space available for each database table against the amount of space allocated to it

Database Space Usage

- **Space Allocated (MB)**: Total amount of space, in megabytes (MB), allocated to a database
- **Space Used (MB):** Total amount of space, in MB, used by a database
- **Free Space (MB):** Total space, in MB, within the database that is currently unallocated
- **Free Space (%):** Percentage of free space available for each database against the amount of space allocated to it

Virtual Device Space Usage

- **Space Allocated (MB)**: Total amount of space, in MB, allocated to a specified virtual device
- **Space Used (MB)**: Total amount of space, in MB, used by the virtual device
- **Free Space (MB)**: Total space, in MB, within the virtual device that is currently unallocated
- **Free Space (%):** Percentage of free space available for each virtual device against the amount of space allocated to it

Average Cache Hit (%): Average number of cache hit percentage for the selected instance.

Average Writes Outstanding Rate (Min): Average number of write requests issued to the operating system that are not completed.

Average CPU Used (%): Percentage CPU time used by SQL Server, which is calculated as seconds of CPU time used by SQL Server in ratio to the total amount of elapsed time since the last probing. This percentage is aggregated for all CPUs in the system.

Average number of Transactions (Sec): Average number of business transactions per second for the entire server.

Number of Locks Wait (Sec): Average number of locks request per second.

Average Reads Outstanding Rate Count: Average number of read requests issued to operating system that were not completed.

Average Writes Outstanding Rate Count: Average number of write requests issued to operating system that were not completed.

Average Outstanding Read Per Minute and Average Outstanding Write Per Minute: Using this, you can compare the ratio between the number of blocks read to the physical reads and identify the instance with least availability and heavy business transaction load. This helps you identify I/O as a bottleneck. Follow any of the following options to improve the I/O performance:

- Add more memory
- Install a faster I/O system
- Review the business application's business transaction management

Average Dead Lock Rate Count: Average number of lock requests per second that resulted in a deadlock for all objects combined.

Average Locks Memory Use Percentage: Average number of lock memory approaching the reconfiguration threshold.

Average Locks TimeOut Rate Count: Average number of lock requests per second that timed out, including internal requests for NOWAIT locks for each object type—Extent, Key, Page, Table, RID, Database.

Average Locks Use Percentage: Average percentage of locks in use.

Average Locks Wait Time Rate Count: Average number of lock requests per second that resulted in a deadlock for all objects combined.

Average Full Scan Rate Count: Average number of unrestricted full scans per second. These can be either base-table or full-index scans. This metric can be useful as an overall indicator of either of the following:

- An increased level of activity in the database
- A change in the types of users

- The way the users are using the database

Average Page Allocated Rate Count: Average number of pages allocated per second to database objects used for storing index or data records. If a large amount of data is being added to the database, or data is being moved in an unfortunate manner it causes page splitting.

Average Extents Allocation Rate Count: Average number of extents allocated per second to database objects used for storing index or data records. This indicates creation of temporary tables. If many new rows are added to indexed database tables, the index may have more than a usual rate of Extents allocated.

Average Index Search Rate Count: Average number of index searches per second. These are used to start range scans and single index record fetches and to reposition an index.

Average Read Write Errors Count: Average number of SQL Server read or write errors since the last probing.

Average Read Write Packet Errors Count: Average number of packet errors while reading or writing packets.

Average Active Transaction: Average number of active business transactions for the entire server.

Average DB Logs Expands: Average number of times the business transaction log for each database has expanded for the entire server.

Average DB Logs Shrinks: Average number of times the business transaction log for each database has shrunk.

Average Active Transactions Count: The average number of active business transactions for the entire server. If the number of active business transactions for the entire server is too high, it leads to increased server workload. To improve the server performance you have to optimize queries, upgrade server hardware, or migrate part of the data to a separate server.

Average Single Page Writes Count: The average number of single page writes performed per second by logging and cache flushes.

If this metric value increases, determine whether it is CPU or I/O bound. If it is CPU bound, add more processors. If it is I/O bound, it's time to revisit the I/O subsystem or add more memory.

Average DB Logs Expands Count: The average number of times the business transaction log has been expanded for the entire server.

If the changes are due to a single unique event, an administrator may consider truncating the log and shrinking it back to its original size.

Average DB Logs Shrinks Count: The average number of times the business transaction log for each database shrinks.

If you want to prevent this, an administrator can disable the automated process and expand the log back to its original size.

Instance Up Time Percentage: The percentage of time the database instances were up and running for a selected node.

Instance Down Time Percentage: The percentage of time the database instances were down and unavailable for a selected node.

Instance Unknown Time Percentage: The percentage of time the availability status of the database instance was unknown to OBR.

Maximum Users Count: Maximum number of users connected to the database.

Average Active to Connected (%): Average number of current active connections as a percentage of total connections.

Average Connected to Configured (%): Average number of current connections as a percentage of total configured.

Average Runnable To Configured (%): Average number of current connections that can be run as a percentage of total connections.

Appendix B: Calculating Microsoft SQL Server Instance Availability

HPE OBR collects five-minute summary data for the Microsoft SQL Server from the HP Performance Agent. This data is in the form of status values as follows:

- Downtime—0
- Uptime—5

The status values are stored in the rate table. The availability calculation procedure in HPE OBR uses this information to calculate the actual uptime, downtime, availability and unknown time values for 5 minute interval. The possible scenarios are as follows:

- If the status value is 5, the procedure interprets it as uptime. The procedure updates the uptime value as 5, and downtime and unknown time values as 0 in the rate table.
- If the status value is 0, the procedure interprets it as downtime. The procedure updates the downtime value as 5, and uptime and unknown time value as 0 in the rate table.
- If, for some reason, HPE OBR is unable to retrieve the status value for particular interval (12 records within an hour, that is, one record each for every five minutes), the procedure interprets it as unknown status. The procedure updates the uptime and downtime values as 0 and unknown time value as 5 in the rate table.

The availability calculation procedure for Microsoft SQL Server instances ensures that 12 records are available for every hour and each record would either represent uptime, downtime, or unknown time. Using this data, the actual uptime, actual downtime, availability and unknown times are calculated as follows:

- **Actual Uptime Percentage**

  Uptime/(Uptime + Downtime)*100

- **Actual Downtime Percentage**

  [(Downtime /(Uptime + Downtime)]*100

- **Availability Computation**

  [(Uptime + Planned Downtime + Excused Downtime)/(Uptime + Downtime)]*100

- **Unknown Time Percentage**

  [(Unknown Time)/(Uptime + Downtime + Unknown Time)]*100

The availability procedure computes the planned downtime and excused downtime based on the configuration provided in the downtime XML file.

For more information on how to configure downtime, see *Configuring downtime in reports* section in *HPE Operations Bridge Reporter Online Help for Administrators*.

Appendix C: Metric Mapping for Reports

HPE OBR provides a utility to generate metric flow documents. The utility has strong filtering capabilities and generates the metric flow documents in HTML format. These HTML output files can then be saved in Excel for further filtering and metric tracking.

To generate the metric flow documents, follow these steps:

1. Run the utility using the following command:

   On Windows:

   ```
   %PMDB_HOME%\bin\shr_utility -flow -dir %PMDB_
   HOME%\packages\DatabaseMSSQL
   ```

   On Linux:

   ```
   $PMDB_HOME/bin/shr_utility -flow -dir $PMDB_
   HOME/packages/DatabaseMSSQL
   ```

   The command generates multiple HTML output files in the current directory.

2. Open the HTML output file in Excel.

   You can apply combination of filters to compare and track a particular metric(s).

Note: The output file in Excel format is published for some of the Content Packs. You can download the files from the following URL:

https://hpln.hp.com/node/24267/attachment

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Feedback on Microsoft SQL Server Content Pack Reference (Operations Bridge Reporter 10.00)

Just add your feedback to the email and click send.

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We appreciate your feedback!