OMi Management Pack for Microsoft SQL Server

Software Version: 1.00

For Operations Manager i for Linux and Windows® operating systems

User Guide

Hewlett Packard Enterprise

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Chapter 1: OMi Management Pack for Microsoft SQL Server

The OMi Management Pack for Microsoft SQL Server (OMi MP for Microsoft SQL Server) works with Operations Manager i (OMi) and enables you to monitor Microsoft SQL Server database environments and its underlying infrastructure using the Business Service Management (BSM). It includes Indicators - Health Indicators (HIs), Event Type Indicators (ETIs) and Correlation Rules that analyze the events that occur in the Microsoft SQL Server databases and report the health status. It provides out of the box Management Templates for monitoring different types of Microsoft SQL Server environments (standalone and cluster) and also includes capabilities to monitor the health and performance of systems. These Management Templates consist of a wide range of Aspects which enable the monitoring of Microsoft SQL Server components and the system components.

These Management Templates can be seamlessly deployed by administrators for monitoring Microsoft SQL Server databases in an environment. The Subject Matter Experts (SMEs) and developers can easily customize the Microsoft SQL Server Management Templates.

The OMi MP for Microsoft SQL Server works with OMi and provides the following additional functionalities to support a unified monitoring solution:

- Microsoft SQL Server instance-based deployment and configuration
- Supports agent and agentless monitoring of SQL Server instances

Chapter 2: Getting Started

The following section provides step-by-step instructions about deploying out-of-the-box components of OMi MP for Microsoft SQL Server for monitoring Microsoft SQL Servers using the BSM or OMi console.

Task 1: Adding Nodes to the BSM 9.2x or OMi 10.x Console

> **Note:** If the Node already exists in RTSM, you can skip this step and proceed to "Task 3: Deploying the Microsoft SQL Server Discovery Aspect".

Before you begin monitoring, you need to add the nodes to the BSM or OMi console.

1. Open the Monitored Nodes pane:

   On BSM 9.2x, click **Admin > Operations Management > Setup > Monitored Nodes**.

   On OMi 10.x, click **Administration > Setup and Maintenance > Monitored Nodes**.

2. In the Node Views pane, click **Predefined Node Filters > Monitored Nodes** and then click ✳ and then click **Computer > Windows**. The Create New Monitored Nodes dialog box appears.

3. Specify the Primary DNS Name, IP Address, Operating System, and Processor Architecture of the node and click **OK**.

   The newly created node is saved as a CI instance in RTSM.

   > **Note:** You must activate the node with Operations Agent on OMi server and grant certificate.

Task 2: Enabling the Enrichment Rules

You must enable the following enrichment rules to populate the Microsoft SQL Server CI's display label with additional information about container or the hostname:

- **SoftwareElementDisplayLabelForNewHost**

- **SoftwareElementDisplayLabelForExistingHost**

- **SoftwareElementDisplayLabelPopulator**

To enable the Enrichment Rules, follow these steps:

1. Open the Enrichment manager pane:

    On BSM 9.2x, click **Admin > RTSM Administration > Modeling > Enrichment manager**.

    On OMi 10.x, click **Administration > RTSM Administration > Modeling > Enrichment manager**.

2. In the Enrichment Rules pane, select **SoftwareElementDisplayLabelForNewHost** from the list.

3. Right-click and select **Properties**. The Enrichment Rule Properties window appears.

4. Click **Next**.

5. Select **Rule is Active**.

6. Click **Finish**.

7. In the Enrichment Rules pane, click 💾 to save the changes.

8. Select **SoftwareElementDisplayLabelForExistingHost** and repeat steps 3 to 7.

9. Select **SoftwareElementDisplayLabelPopulator** and repeat steps 3 to 7.

Task 3: Deploying the Microsoft SQL Server Discovery Aspect

To discover the Microsoft SQL Server CIs on the added managed nodes, you must deploy the Microsoft SQL Server Discovery Aspect.

1. Open the Management Templates & Aspects pane:

    On BSM 9.2x, click **Admin > Operations Management > Monitoring > Management Templates and Aspects**.

    On OMi 10.x, click **Administration > Monitoring > Management Templates & Aspects**.

2. In the Configuration Folders pane:

Configuration Folders > Database Management > Microsoft SQL Server > Microsoft SQL Server Aspects.

3. In the Microsoft SQL Server Aspects folder, right-click the **Microsoft SQL Server Discovery** Aspect, and then click ✦**Assign and Deploy Item** to open the Assign and Deploy Wizard.

4. In the **Configuration Item** tab, click the configuration item to which you want to deploy the Discovery aspect and then click **Next**.

5. *(Optional).* In the **Required Parameters** tab, click **Next**.

   > **Note:** Microsoft SQL Server Discovery Aspect do not have mandatory parameters. You will get a notification stating the following message:`There are no parameters that require editing for this Assignment.`

6. *(Optional).* In the **All Parameters** tab on BSM 9.2x or **Parameter Summary** tab on OMi 10.x, click **Next**.

7. *(Optional).* If you do not want to enable the assignment immediately, follow the step:

   On BSM 9.2x, clear the **Enable Assigned Objects** check box.

   On OMi 10.x, clear the **Enable Assignment(s)** check box.

   You can then enable the assignment later using the Assignments & Tuning pane.

8. Click **Finish**.

> **Note:** After the Microsoft SQL Server Discovery Aspect is deployed, a message stating the `Assignment and deployment jobs created` appears. To check the status of the deployment jobs, go to the following location:
>
> On BSM 9.2x, click **Admin > Operations Management > Monitoring > Deployment Jobs**.
>
> On OMi 10.x, click **Administration > Monitoring > Deployment Jobs**.

Task 4: Verifying Discovery

After you deploy the Microsoft SQL Server Discovery Aspect, you must verify if the CIs are populated in the View Explorer.

To view the CIs populated in the View Explorer, follow these steps:

1. Open the Events Perspective pane:

   On BSM 9.2x, click **Applications > Operations Management > Event Perspective**.

   On OMi 10.x, click **Workspaces > Operations Console > Event Perspective**.

2. In the View Explorer, select **MSSQL_Cluster_Deployment** or **MSSQL_Database_Deployment** view from the drop-down list to see the associated CIs.

Task 5: Deploying the Microsoft SQL Server Management Templates or Microsoft SQL Server Aspects

This section provides information about user privileges requried for monitoring, data collection process, and deploying Management Templates and Aspects. For more information about deploying Microsoft SQL Management Templates, go to "Task 5a: Deploying Microsoft SQL Server Management Templates". For more information about deploying Microsoft SQL Aspects, go to "Task 5b: Deploying Microsoft SQL Server Aspects".

User Privileges

Make sure SQL user has following grants and privoleges to monitor Microsoft SQL Server instances.

Following is the list of grants and privileges of Microsoft SQL Server user account for OMi MP for Microsoft SQL Server:

Database master:	Database msdb:
• GRANT select ON sys.sysperfinfo	• GRANT select ON msdb..sysjobs
• GRANT select ON sys.sysprocesses	• GRANT select ON msdb..sysjobhistory
• GRANT select ON sys.dm_tran_locks	• GRANT select ON msdb..sysjobsteps
• GRANT select ON sys.sysconfigures	• GRANT select ON msdb..sysjobschedules
• GRANT select ON sys.databases	• GRANT select ON msdb..sysjobs_view
• GRANT select ON sys.sysdatabases	• GRANT select ON msdb..MSdistributiondbs
• GRANT select ON sys.sysfiles	• GRANT select ON msdb..log_shipping_monitor_ primary

Database master:	Database msdb:
• GRANT select ON sys.sysindexes • GRANT select ON sys.sysobjects • GRANT select ON sys.sysdevices • GRANT execute ON sys.sp_monitor • GRANT execute ON sys.xp_sqlagent_enum_jobs • GRANT VIEW SERVER STATE to '<user>'	• GRANT select ON msdb..log_shipping_primary_databases • GRANT select ON msdb..log_shipping_monitor_error_detail • GRANT select ON msdb..log_shipping_monitor_secondary • GRANT select ON msdb..log_shipping_secondary • GRANT select ON msdb..sysjobservers • GRANT select ON msdb..sysjobactivity • GRANT execute ON msdb..sp_help_job • EXEC sp_addrolemember 'SQLAgentReaderRole', '<user>'

On all the databases, run the stored procedure `sp_grantdbaccess` by typing the following command:

`EXEC sp_grantdbaccess '<user>','<passwd>'`

Grant the following to all the databases:

`GRANT select on executionlog`

Grant the following to all databases listed in the `msdb.MSdistributiondbs`:

- GRANT select ON MSmerge_agents
- GRANT select ON MSmerge_history
- GRANT select ON MSmerge_sessions
- GRANT select ON MSsnapshot_agents
- GRANT select ON MSlogreader_agents
- GRANT select ON MSdistribution_history
- GRANT select ON MSsnapshot_history
- GRANT select ON MSlogreader_history
- GRANT select ON MSdistribution_agents

Note: The Microsoft SQL Server metric 3035 needs the `DBCC opentran` privilege to run.

Data Collection

Frequency (polling interval) at which each policy must be monitored is predefined with a default value in a specific frequency parameter. Frequency parameter is an expert parameter that is defined for each of the metrics regardless of whether they are for generating events or not.

Following are the four predefined frequency parameters:

Parameter	Frequency
Very High	5 mins
High	15 mins
Medium	1 hour
Low	24 hours

After Management Templates and Aspects are deployed, the collector is triggered based on the predefined frequency parameter in a specific policy. You can modify the default value of the parameter at following two levels:

- During deployment of the Management Template or Aspects using the Management Templates & Aspects pane.

- After deployment using the Assignments & Tuning pane.

For more information about how to modify the parameter values, see section *Editing Parameters in the OMi MP for Microsoft SQL Server User Guide.*

Task 5a: Deploying Microsoft SQL Server Management Templates

You **must** deploy the Microsoft SQL Server Discovery Aspect even if the CIs are already populated by any other source such as SiteScope, DDM, and so on. For more information, see "Task 3: Deploying the Microsoft SQL Server Discovery Aspect".

Before deploying the Microsoft SQL Server Management Templates, you must identify the Microsoft SQL Server Management Template suitable for your environment by following these recommendations:

- If you want to monitor the standalone Microsoft SQL Server environment, you can deploy **Extensive Microsoft SQL Server Management Template**.

- If you want to monitor basic functionality of Microsoft SQL Server cluster environment, you can deploy **Essential Microsoft SQL Server Cluster Management Template**.

- For in-depth and detailed monitoring of Microsoft SQL Server cluster environment, you can deploy **Extensive Microsoft SQL Server Cluster Management Template**.

- For agent and agentless monitoring, you can deploy **Hybrid Microsoft SQL Server Management Template**.

To deploy the Microsoft SQL Server Management Templates to the Microsoft SQL Server CIs, follow these steps:

1. Open the Management Templates & Aspects pane:

   On BSM 9.2x, click **Admin > Operations Management > Monitoring > Management Templates & Aspects**.

   On OMi 10.x, click **Administration > Monitoring > Management Templates & Aspects**.

2. In the Configuration Folders pane, click:

   Configuration Folders > Microsoft SQL Server > Microsoft SQL Server Management Templates.

3. In the **Microsoft SQL Server Management Templates** folder, click the Management Template that you want to deploy, and then click 🌐. The Assign and Deploy wizard opens.

4. In the **Configuration Item** tab, click the CI to which you want to assign the Management Template, and then click **Next**.

5. In the **Required Parameters** tab, you must specify the parameters based on the environment:

   Note: For **Microsoft SQL Server with Windows authentication**: You do not have to specify the Domain Name, User Name, and Password.

   For **Mixed Mode authentication**: You must specify the user name and password of the SQL Server User.

   For **Microsoft SQL Server Domain Authentication**: You must specify the user name, domain name, and password of the system.

   For **Hybrid Microsoft SQL Server Management Template**: The assignment is supported with SQL Server Authentication.

> **Note:** The User Name that you enter during the deployment of a Management Template must have the required privileges to connect to the Microsoft SQL Server and collect the data for monitoring needs of OMi MP for Microsoft SQL Server. Following are the guidelines:
>
> ○ When you have the predefined User Name created by the admin, you can use the same while deploying the Management Template.
>
> ○ When you want to use the create user tools provided by Management Pack explicitly, you need to deploy Management Templates without entering the User Name and Password as there are no mandatory parameters.
>
> After you deploy the Management Template, all the files are deployed and you can run the create user tool to create users and update the User Name and Password parameters to begin the monitoring.

   a. Select the **Microsoft SQL Server Instance User Name** parameter in the list, and then click
      . The Microsoft SQL Server Instance User Name dialog box opens.

   b. Click **Value**, specify the value, and then click **OK**.

   c. Select the **Microsoft SQL Server Instance Password** parameter in the list, and then click
      . The Microsoft SQL Server Password dialog box opens.

   d. Click **Value**, specify the value, and then click **OK**.

   e. Select the **Microsoft SQL Server Domain Name** parameter in the list, and then click the
      . The Microsoft SQL Server Domain Name dialog box opens.

   f. Click **Value**, specify the value, and then click **OK**.

   f. Click **Next**.

6. In the **All Parameters** tab on BSM 9.2x or **Parameter Summary** tab on OMi 10.x, you can change the default values of the parameters. To change the default values of the parameters, follow these steps:

   a. Select the **MSSQL Server Instance Name** parameter and then click . The Edit Instance Parameter window appears.

   b. Select the parameter from the list and then click . The Edit Parameter dialog box opens. Click **Value**, specify the value, and then click **OK**.

      > **Note:** In the **All Parameters** tab on BSM 9.2x or **Parameter Summary** tab on OMi 10.x, you can override the default values of any parameter. You can specify a value for each parameter at the Management Template level. By default, parameters defined as expert

> parameters are not shown. To show expert parameters, click 🐝 **Show Expert Parameters**.

   c. Click **Next**.

7. *(Optional).* In the **Configure Options** tab, if you do not want to enable the assignment immediately, follow the step:

   On BSM 9.2x, clear the **Enable Assigned Objects** check box.

   On OMi 10.x, clear the **Enable Assignment(s)** check box.

   You can then enable the assignment later using the Assignments & Tuning pane.

8. Click **Finish**.

Task 5b: Deploying Microsoft SQL Server Aspects

You **must** deploy the Microsoft SQL Server Discovery Aspect even if the CIs are already populated by any other source such as SiteScope, DDM, and so on. For more information, see "Task 3: Deploying the Microsoft SQL Server Discovery Aspect".

To deploy Microsoft SQL Aspects to the Microsoft SQL Server CIs, follow these steps:

1. Open the Management Templates & Aspects pane:

   On BSM 9.2x, click **Admin > Operations Management > Monitoring > Management Templates & Aspects**.

   On OMi 10.x, click **Administration > Monitoring > Management Templates & Aspects**.

2. In the Configuration Folders pane:

   Configuration Folders > Database Management > Microsoft SQL Server > Microsoft SQL Server Aspects.

3. In the **Microsoft SQL Server Aspects** folder, right-click the Microsoft SQL Aspect that you want to deploy, and then click **Assign and Deploy** item to open the Assign and Deploy Wizard.

4. In the **Configuration Item** tab, click the configuration item to which you want to deploy the Aspect and then click **Next**.

5. *(Optional).* In the **Required Parameters** tab, click **Next**.

> **Note:** Microsoft SQL Server Aspects do not have Mandatory Parameters. You will get a notification stating that `There are no parameters that require editing for this Assignment.`

6. *(Optional).* In the **All Parameters** tab on BSM 9.2x or **Parameter Summary** tab on OMi 10.x, you can change the default values of the parameters. To edit the parameters, follow these steps:

    a. Double-click the parameter, or select the parameter from the list, and then click ✎ . The Edit Parameter window opens.

    b. Change the default value and click **OK**.

    c. Click **Next**.

7. *(Optional).* In the **Configure Options** tab, if you do not want to enable the assignment immediately, follow the step:

    On BSM 9.2x, clear the **Enable Assigned Objects** check box.

    On OMi 10.x, clear the **Enable Assignment(s)** check box.

    You can then enable the assignment later using the Assignments & Tuning pane.

8. Click **Finish**.

Checking Topology Synchronization Settings

If there are Operations Manager (OM) servers in the environment and you want to synchronize the topology information discovered by Smart Plug-in for Microsoft SQL Server (SPI for Microsoft SQL Server) to the OMi, then follow these steps:

1. Open the Infrastructure Settings from the Administration:

    On BSM 9.2x, click **Admin > Platform > Setup and Maintenance > Infrastructure Settings**.

    On OMi 10.x, click **Administration > Setup and Maintenance > Infrastructure Settings**.

2. In the Infrastructure Settings pane, select **Applications > Operations Management**.

3. In the **Operations Management - HPOM Topology Synchronization Settings**, the packages for Topology Sync should contain the packages that are used for topology synchronization - **default;nodegroups;operations-agent;HPOprSys;HPOprMss**.

4. If the package is not available, add the toposync package by following these steps:

      a. In the Packages for Topology Sync, click .

      b. In Value, add **HPOprMss** and click **Save**.

Chapter 3: Components

The OMi MP for Microsoft SQL Server includes the following components for monitoring Microsoft SQL Server databases in an environment:

- "Microsoft SQL Server Management Templates"

- "Microsoft SQL Server Aspects"

- "Parameters"

- "Configuration Item (CI) and Configuration Item Types(CITs)"

- "Run-time Service Model (RTSM) Views"

- "Health Indicators"

- "Event Type Indicators"

- "Policies Setting ETIs and HIs"

- "Topology Based Event Correlation (TBEC) Rules"

- "Operations Orchestration Flows"

- "Tools"

Microsoft SQL Server Management Templates

The Microsoft SQL Server Management Templates consist of several Microsoft SQL Server Aspects, which enable you to monitor Microsoft SQL Server databases, based on the criticality and type of the environment. By default, the OMi MP for Microsoft SQL Server consists of a set of Management Templates. You can deploy the out of the box Management Templates with the default parameters or you can customize the Management Templates based on your requirements. In addition, you can also create Microsoft SQL Server Management Templates based on the monitoring requirements using the Microsoft SQL Server Aspects.

Overview

The OMi MP for Microsoft SQL Server comprises the following Management Templates:

- "Essential Microsoft SQL Server Cluster Management Template"

- "Extensive Microsoft SQL Server Management Template"

- "Extensive Microsoft SQL Server Cluster Management Template"

- "Hybrid Microsoft SQL Server Management Template"

How to Access Microsoft Management Template

1. Open Management Templates & Aspects pane:

   On BSM, click **Admin > Operations Management > Monitoring > Management Templates & Aspects**.

   On OMi, click **Administration > Monitoring > Management Templates & Aspects**.

2. In the Configuration Folder pane, click **Configuration Folders > Database Management > Microsoft SQL Server > Microsoft SQL Server Management Templates**.

Tasks

How to Deploy Microsoft SQL Server Management Templates

For more information about deploying Microsoft SQL Server Management Templates, see "Task 5: Deploying the Microsoft SQL Server Database Management Templates or Microsoft SQL Aspects".

How to Automatically Assign Microsoft SQL Server Management Templates or Microsoft SQL Server Aspects

To automatically assign Microsoft SQL Server Management Templates or Microsoft SQL Server Aspects, you must specify the required privileges. To automatically assign, follow these steps:

1. Open Automatic Assignment Rules pane:

   On BSM, click **Admin > Operations Manager > Monitoring > Automatic Assignment Rules**.

   On OMi, click **Administration > Monitoring > Automatic Assignment Rules**.

   The pane consists of the Auto-Assignment Rules pane at the top, and a parameter list at the bottom.

2. Click ✳ **New Assignment** in the toolbar of the **Auto-Assignment Rules** pane and select the appropriate option. The Create Auto-Assignment Rule wizard appears.

3. Select the Microsoft SQL Server View containing the CIs for which you want to create an automatic assignment, and click **Next**.

4. In **Select Item to Assign** window, click the **Microsoft SQL Server Management Template** or Aspect that you want to automatically assign to all CIs with a CIT appearing in the selected view.

   > **Note:** The list shows only the Management Templates that have a root CIT that appears in the View that you selected or, if an Aspect is auto-assigned, only the compatible Aspects appear.
   >
   > By default, the latest version of the Management Template or Aspect that you want to assign is selected. If required, select a different version in column **Version**.

5. Click **Next** to go to **Required Parameters**.

6. This step lists all mandatory parameters in the Management Template that do not yet have a value. As they are mandatory, however, all listed parameters *must* be given a value before the Management Template can be deployed.

   If all required values are specified, you can choose one of the following actions:

   ○ Click **Finish** to assign the configuration object to the selected CI and close the wizard or dialog.

   ○ Click **Next** to go to **All Parameters** on BSM and **Parameter Summary** on OMi, where you can override the default value of any parameter, including those that are not required.

   > **Note:** To access step *Configure Options*, click **Next** in this step, and **Next** again in step *All Parameters/Parameters Summary*.

   To change a parameter, double-click it, or select it in the list and click 🖉 **Edit**.

   ○ For standard parameters, the **Edit Parameter** dialog opens.

     Click **Value**, specify the value, and then click **OK**.

   ○ For instance parameters, the **Edit Instance Parameter** dialog opens.

     Add instance values, and then for each instance value, specify dependent parameter values. After you specify the instances and dependent parameter values, click **OK**.

7. *Optional.* In step **All Parameters/Parameter Summary**, specify a value for each parameter to be monitored against a different value than the default value.

To change a parameter, double-click it, or select it in the list and click **Edit**.

- For standard parameters, the **Edit Parameter** dialog opens.

  Click **Value**, specify the value, and then click **OK**.

- For instance parameters, the **Edit Instance Parameter** dialog opens.

  Add instance values, and then for each instance value, specify dependent parameter values. After you specify the instances and dependent parameter values, click **OK**.

Click **Next** to go to the **Configure Options** tab, or **Finish** to save the assignment and close the wizard.

8. *Optional.* In step **Configuration Options**, clear the **Activate Auto-Assignment Rule** check box if you do not want to activate the assignment rule immediately.

9. Click **Finish** to save the changes and close the wizard. The assignment rule is added to the list of auto-assignment rules.

An assignment may trigger an event to be sent to OMi if one of the following situations applies:

- A deployment job fails.

- An auto-assignment fails.

- An auto-assignment succeeds. This behavior can be configured in the Infrastructure Settings.

You can check if the automatic assignment rule successfully created the expected assignments as follows:

- Go the Assignments & Tuning pane:

  On BSM, click **Admin > Operations Management > Monitoring > Assignments & Tuning**

  On OMi, click **Administration > Monitoring > Assignments & Tuning**.

- In the Browse Views pane, select the view you identified when creating your automatic assignment rule.

- Expand the view, and select a node that corresponds to the root CI type of the assigned item. Assignments created as a result of Automatic Assignment Rules are shown in the list of assignments at the top of the right pane, and have the value Auto Assignment in the column Assigned By.

You can consider the following options for tuning the assignment:

- Use the Automatic Assignment Rules screen to tune the parameter values for all assignments triggered by the automatic assignment rule.

- Use the Assignments and Tuning screen to tune, redeploy, delete, and enable or disable individual assignments.

How to Display an Assignment Report for a Microsoft SQL Server Management Template

1. Select the Management Template for which you want to create a report.

2. Click **Generate Assignment Report** in the **Management Templates & Aspects** pane.

   The preconfigured **Assignment Report** appears.

You can display additional types of reports from the Assignments & Tuning pane.

> **Note:** The list shows only the Management Templates that have a root CIT that appears in the View that you selected or, if an Aspect is auto-assigned, only the compatible Aspects appear.
>
> The latest version of the Management Template or Aspect that you want to assign is selected by default. If required, select a different version in column **Version**.

Essential Microsoft SQL Server Cluster Management Template

The Essential Microsoft SQL Server Cluster Management Template can be used to monitor primary monitoring areas of Microsoft SQL Server clusters in an environment. It comprises of essential Microsoft SQL Server Aspects and Infrastructure Aspects for monitoring the availability, health, and performance of Microsoft SQL Server databases.

> **Note:** To use and deploy Infrastructure Aspects, you must install OMi Management Pack for Infrastructure software.

How to Access Essential Microsoft SQL Server Cluster Management Template

1. Open Management Templates & Aspects pane:

   On BSM, click **Admin > Operations Management > Monitoring > Management Templates & Aspects**.

   On OMi, click **Administration > Monitoring > Management Templates & Aspects**.

2. In the Configuration Folders pane, click **Configuration Folders > Database Management > Microsoft SQL Server > Microsoft SQL Server Management Templates > Essential Microsoft SQL Server Cluster Management Template**.

User Interface Reference

Management Template - General

Provides an overview of the attributes of the Management Template.

UI Element	Description
Name	Essential Microsoft SQL Server Cluster Management Template.
Description	Manages primary monitoring areas of Microsoft SQL Server Failover Cluster instance environments for availability, locks, Transaction, Space and so on along with critical infrastructure areas of CPU, Memory, and Disk.
ID	A unique identifier for this version of the Management Template.
Version ID	A unique identifier for this version of the Management Template.
Version	The current version of the Management Template. In this instance, the version of the Management Template is 1.0.
Change Log	Text that describes what is new or modified in this version of the Management Template.

Management Template - Topology View

UI Element	Description
Topology View	MSSQL_Cluster_Deployment is the Topology View for Essential Microsoft SQL Server Cluster Management Template.
CI Type	The type of configuration items that the Essential Microsoft SQL Server Cluster Management Template enables you to manage. FailoverCluster is the type of CI to which the Management Template can be assigned.

Management Template - Aspects

The Essential Microsoft SQL Server Cluster Management Template contains the following Aspects:

- "Microsoft SQL Server Availability"

- "Microsoft SQL Server Base"

- "Microsoft SQL Server Data Access Methods"

- "Microsoft SQL Server Discovery"

- "Microsoft SQL Server Error"

- "Microsoft SQL Server IO Utilization"

- "Microsoft SQL Server Jobs"

- "Microsoft SQL Server Latches"

- "Microsoft SQL Server Locks"

- "Microsoft SQL Server Processes and Statistics"

- "Microsoft SQL Server Space"

- "Microsoft SQL Server Transactions"

The Essential Microsoft SQL Server Management Template contains the following Infrastructure Aspects:

Cluster Infrastructure Discovery

The Cluster Infrastructure Discovery Aspect discovers the high availability components such as cluster nodes and resource pool availability in a clustered environment. This Aspect consists of the following policy templates:

Cluster Strength and Status

The Cluster Strength and Status Aspect monitors the single point of failure (SPOF), quorum conditions, and node strength in a clustered environment. This Aspect consists of the following policy templates:

System Fault Analysis

The System Fault Analysis Aspect monitors the kernel log file, boot log file, and event log file for critical error conditions and instructions on what might have caused it.

Resource Bottleneck Diagnosis

The Resource Bottleneck Diagnosis Aspect identifies congestions and bottleneck conditions for system resources like the CPU, memory, network and disk. CPU bottleneck monitoring is based on global CPU utilization and load average (Run Queue Length).

Extensive Microsoft SQL Server Management Template

The Extensive Microsoft SQL Server Management Template can be used to monitor primary and advanced monitoring areas of Microsoft SQL Server databases in an environment. It comprises of Microsoft SQL Server Aspects and Infrastructure Aspects for monitoring the availability, health, and performance of Microsoft SQL Server databases.

> **Note:** To use and deploy Infrastructure Aspects, you must install OMi Management Pack for Infrastructure software.

How to Access Extensive Microsoft SQL Server Management Template

1. Open Management Templates & Aspects pane:

   On BSM, click **Admin > Operations Management > Monitoring > Management Templates & Aspects**.

   On OMi, click **Administration > Monitoring > Management Templates & Aspects**.

2. In the Configuration Folders pane, click **Configuration Folders > Database Management > Microsoft SQL Server > Microsoft SQL Server Management Templates > Extensive Microsoft SQL Server Management Template**.

User Interface Reference

Management Template - General

Provides an overview of the attributes of the Management Template.

UI Element	Description
Name	Extensive Microsoft SQL Server Management Template
Description	Manages primary and advanced areas of Microsoft SQL Server standalone database instance environments for availability, DB Mirroring, Backup, LogShipping, Replication, and so on along with deep infrastructure areas of CPU, Memory, and Disk.
ID	A unique identifier for this version of the Management Template.

UI Element	Description
Version ID	A unique identifier for this version of the Management Template.
Version	The current version of the Management Template. In this instance, the version of the Management Template is 1.0.
Change Log	Text that describes what is new or modified in this version of the Management Template.

Management Template - Topology View

UI Element	Description
Topology View	MSSQL_Database_Deployment is the Topology View for Extensive Microsoft SQL Server Management Template.
CI Type	The type of CIs that the Extensive Microsoft SQL Server Management Template enables you to manage.

Management Template - Aspects

The Extensive Microsoft SQL Server Management Template contains the following Aspects:

- "Microsoft SQL Server Availability"

- "Microsoft SQL Server Base"

- "Microsoft SQL Server Backup"

- "Microsoft SQL Server Data Access Methods"

- "Microsoft SQL Server Database Mirroring"

- "Microsoft SQL Server Discovery"

- "Microsoft SQL Server Error"

- "Microsoft SQL Server IO Utilization"

- "Microsoft SQL Server Jobs"

- "Microsoft SQL Server Latches"

- "Microsoft SQL Server Locks"

- "Microsoft SQL Server LogShipping"

- "Microsoft SQL Server Processes and Statistics"

- "Microsoft SQL Server Replication"

- "Microsoft SQL Server Reports"

- "Microsoft SQL Server Space"

- "Microsoft SQL Server Transactions"

The Extensive Microsoft SQL Server Management Template contains the following Infrastructure Aspects:

Space Availability and Disk IOPS

Monitors the disk I/O operations and space utilization of the system.

Bandwidth Utilization and Network IOPS

Monitors I/O operations, and performance of the systems in the network. It monitors the network I/O operations and performance based on the bandwidth used, outbound queue length and average bytes transferred per second.

CPU Performance

Monitors I/O operations, and performance of the systems in the network. It monitors the network I/O operations and performance based on the bandwidth used, outbound queue length and average bytes transferred per second.

Memory and Swap Utilization

Monitors memory performance of the system. Memory performance monitoring is based on Memory utilization (in percentage), Swap space utilization (in percentage), Free memory available (in MBs) and Free swap space available (in MBs).

Remote Disk Space Utilization

Monitors the space utilization of the remote disk.

System Infrastructure Discovery

Discovers and gathers information regarding the system resources, operating system, and applications on a managed node.

Extensive Microsoft SQL Server Cluster Management Template

The Extensive Microsoft SQL Server Cluster Management Template is used to monitor primary and advanced monitoring areas of Microsoft SQL Server Failover clusters in an environment. It comprises of Microsoft SQL Server Aspects and Infrastructure Aspects for monitoring the availability, health, and performance of Microsoft SQL Server databases.

> **Note:** To use and deploy Infrastructure Aspects, you must install OMi Management Pack for Infrastructure software.

How to Access Extensive Microsoft SQL Server Cluster Management Template

1. Open Management Templates & Aspects pane:

   On BSM, click **Admin > Operations Management > Monitoring > Management Templates & Aspects**.

   On OMi, click **Administration > Monitoring > Management Templates & Aspects**.

2. In the Configuration Folders pane, click **Configuration Folders > Database Management > Microsoft SQL Server > Microsoft SQL Server Management Templates > Extensive Microsoft SQL Server Cluster Management Template**.

User Interface Reference

Management Template - General

Provides an overview of the attributes of the Management Template.

UI Element	Description
Name	Extensive Microsoft SQL Server Cluster Management Template.
Description	Manages primary monitoring areas of Microsoft SQL Server Failover Cluster instance environments for availability, locks, Transaction, Space, and so on along with critical infrastructure areas of CPU, Memory and Disk.
ID	A unique identifier for this version of the Management Template.
Version ID	A unique identifier for this version of the Management Template.
Version	The current version of the Management Template. In this instance, the version of the Management Template is 1.0.
Change Log	Text that describes what is new or modified in this version of the Management Template.

Management Template - Topology View

UI Element	Description
Topology View	MSSQL_Cluster_Deployment is the Topology View for Extensive Microsoft SQL Server Cluster Management Template.
CI Type	The type of configuration items that the Extensive Microsoft SQL Server Cluster Management Template enables you to manage.

Management Template - Aspects

The Essential Microsoft SQL Server Cluster Management Template contains the following Aspects:

"Microsoft SQL Server Availability"

"Microsoft SQL Server Base"

"Microsoft SQL Server Backup"

"Microsoft SQL Server Data Access Methods"

"Microsoft SQL Server Database Mirroring"

"Microsoft SQL Server Discovery"

"Microsoft SQL Server Error"

"Microsoft SQL Server IO Utilization"

"Microsoft SQL Server Jobs"

"Microsoft SQL Server Latches"

"Microsoft SQL Server Locks"

"Microsoft SQL Server LogShipping"

"Microsoft SQL Server Processes and Statistics"

"Microsoft SQL Server Replication"

"Microsoft SQL Server Reports"

"Microsoft SQL Server Space"

"Microsoft SQL Server Transactions"

The Essential Microsoft SQL Server Cluster Management Template contains the following Infrastructure Aspects:

Cluster Infrastructure Discovery

Discovers the HA Cluster Components such as Cluster Nodes and Resource Pools.

Cluster Strength and Status

The Cluster Strength and Status Aspect monitors the single point of failure (SPOF), quorum conditions, and node strength in a clustered environment. This Aspect consists of the following policy templates:

Remote Disk Space Utilization

Monitors the space utilization of the remote disk.

Bandwidth Utilization and Network IOPS

Monitors I/O operations, and performance of the systems in the network. It monitors the network I/O operations and performance based on the bandwidth used, outbound queue length and average bytes transferred per second.

CPU Performance

Monitors I/O operations, and performance of the systems in the network. It monitors the network I/O operations and performance based on the bandwidth used, outbound queue length and average bytes transferred per second.

Memory and Swap Utilization

Monitors memory performance of the system. Memory performance monitoring is based on Memory utilization (in percentage), Swap space utilization (in percentage), Free memory available (in MBs) and Free swap space available (in MBs).

Space Availability and Disk IOPS

Monitors the disk I/O operations and space utilization of the system.

Hybrid Microsoft SQL Server Management Template

The Hybrid Microsoft SQL Server Management Template can be used for monitoring Microsoft SQL Server databases in an environment using agent and agentless monitoring. It comprises agent based Microsoft SQL Server Aspects, agent based Infrastructure Aspects, and agentless Microsoft SQL Server Aspects.

> **Note:** To use and deploy Infrastructure Aspects, you must install OMi Management Pack for Infrastructure software.

How to Access Hybrid Microsoft SQL Server Management Template

1. Open Management Templates & Aspects pane:

   On BSM, click **Admin > Operations Management > Monitoring > Management Templates & Aspects**.

   On OMi, click **Administration > Monitoring > Management Templates & Aspects**.

2. In the Configuration Folders pane, click **Configuration Folders > Database Management > Microsoft SQL Server > Microsoft SQL Server Management Templates > Hybrid Microsoft SQL Server Management Template**.

User Interface Reference

Management Template - General

Provides an overview of the attributes of the Management Template.

UI Element	Description
Name	Hybrid Microsoft SQL Server Management Template.
Description	Manages primary and advanced areas of Microsoft SQL Server standalone database instance environments using Agent for availability, DB Mirroring, Backup, LogShipping, Replication, and so on along with deep infrastructure areas of CPU, Memory, and Disk. This also includes Agentless Microsoft SQL Server Aspects to monitor Microsoft SQL Server standalone database instance environments for availability.
ID	A unique identifier for this version of the Management Template.
Version ID	A unique identifier for this version of the Management Template.
Version	The current version of the Management Template. In this instance, the version of the Management Template is 1.0.
Change Log	Text that describes what is new or modified in this version of the Management Template.

Management Template - Topology View

UI Element	Description
Topology View	MSSQL_Database_Deployment is the Topology View for Hybrid Microsoft SQL Server Management Template.
CI Type	The type of configuration items that the Microsoft SQL Server Management Template enables you to manage.

Management Template - Aspects

The Hybrid Microsoft SQL Server Management Template contains the following Aspects:

- "Microsoft SQL Server Availability"

- "Microsoft SQL Server Availability (Agentless)"

- "Microsoft SQL Server Base"

- "Microsoft SQL Server Backup"

- "Microsoft SQL Server Data Access Methods"

- "Microsoft SQL Server Database Mirroring"

- "Microsoft SQL Server Discovery"

- "Microsoft SQL Server Error"

- "Microsoft SQL Server IO Utilization"

- "Microsoft SQL Server Jobs"

- "Microsoft SQL Server Latches"

- "Microsoft SQL Server Locks"

- "Microsoft SQL Server LogShipping"

- "Microsoft SQL Server Processes and Statistics"

- "Microsoft SQL Server Replication"

- "Microsoft SQL Server Reports"

- "Microsoft SQL Server Response Time (Agentless)"

- "Microsoft SQL Server Space"

- "Microsoft SQL Server Transactions"

The Hybrid Microsoft SQL Server Management Template contains the following Infrastructure Aspects:

Remote Disk Space Utilization

Monitors the space utilization of the remote disk.

Space Availability and Disk IOPS

Monitors the disk I/O operations and space utilization of the system.

Memory and Swap Utilization

Monitors memory performance of the system. Memory performance monitoring is based on Memory utilization (in percentage), Swap space utilization (in percentage), Free memory available (in MBs) and Free swap space available (in MBs).

CPU Performance

Monitors I/O operations, and performance of the systems in the network. It monitors the network I/O operations and performance based on the bandwidth used, outbound queue length and average bytes transferred per second.

Bandwidth Utilization and Network IOPS

Monitors I/O operations, and performance of the systems in the network. It monitors the network I/O operations and performance based on the bandwidth used, outbound queue length and average bytes transferred per second.

Remote Disk Space Utilization

Monitors the space utilization of the remote disk.

System Infrastructure Discovery

Discovers and gathers information regarding the system resources, operating system, and applications on a managed node.

Microsoft SQL Server Aspects

Microsoft SQL Server Aspects can be used to monitor the building blocks or units of Microsoft SQL Server. A Microsoft SQL Server Aspect comprises of policy templates, instrumentation, and parameters for monitoring the health and performance of Microsoft SQL Servers.

How to Access Microsoft SQL Server

1. Open Management Templates & Aspects pane:

   On BSM, click **Admin > Operations Management > Monitoring > Management Templates & Aspects**

On OMi, click **Administration > Monitoring > Management Templates & Aspects**

2. In the Configuration Folder pane, click **Configuration Folders > Database Management > Microsoft SQL Server > Microsoft SQL Server Aspects**.

Tasks

How to Create Microsoft SQL Server Aspects

1. Open the Management Templates & Aspects pane:

   On BSM, click **Admin > Operations Management > Monitoring > Management Templates & Aspects**

   On OMi, click **Administration > Monitoring > Management Templates & Aspects**

2. In the Configuration Folders pane, click **Configuration Folders > Database Management > Microsoft SQL Server > Microsoft SQL Server Aspects**.

3. In the Management Templates & Aspects pane, click ✳ , and then click 🖹 **Aspect**. The Create Aspect wizard opens.

4. In the **General** tab, type a unique **Name** for the new aspect.

   Click **Next**.

5. Each aspect enables you to manage one feature or characteristic of one or more types of configuration item. In the CI Types page, select one or more **Available CI Type(s)** to which this Aspect can be assigned, and then click ➡ to add them to the list of assigned CI types. (Press **CTRL** to select several CI types.)

   Click **Next**.

6. In the **Instrumentation** tab, click 🖹 to add instrumentation to the aspect. The Add Instrumentation dialog box opens, that enables you to select the instrumentation that you want to add. Click **Next**.

7. *Optional.* In the **Aspects** tab, click ➕ , and then click 🖹 **Add Existing Aspect**. The Add Existing Aspect dialog box opens, which enables you to select an existing aspect that you want to nest within this aspect. Click an aspect, and then click **OK**. Click **Next**.

8. If suitable Aspects do not exist, click ➕ , and then click 🖹 **Add New Aspect** to create them from here.

9. In the **Policy Templates** tab, click ➕ **Add Policy Template** on BSM or **Add Policy Template From List** on OMi. The Add Policy Template to Aspect or Add Policy Template From List dialog box opens. Select the policy templates that you want to add, and then click **OK**. (Press **CTRL** to select several policy templates.)

10. If suitable policy templates do not exist, click ✳ , and then click ✳ **Add New Policy Template** to create policy templates.

11. In the Policy Templates page, select the **Version** of the policy templates that you want to add.

    Each modification to a policy template is stored in the database as a separate version. Aspects contain specific versions of policy templates. If a new version of a policy template becomes available later, you must update the aspect to include the latest version.

12. *Optional.* In the Policy Templates page, click the policy template to which you want to add a deployment condition, click 🖊 , and then click 🚦 **Edit Deployment Condition**. The Edit Deployment Condition dialog box opens, that enables you to specify deployment conditions for the selected policy template. Set the condition and then click **OK**.

    In the Policy Templates page, click **Next**.

13. In the Parameters page, you see a list of all the parameters from the policy templates that you added to this aspect.

    To combine parameters:

    a. Press **CTRL** and click parameters that you want to combine.

    b. Click 🔲. The Edit/Combine Parameters dialog box opens.

    c. Type a **Name** for the combined parameters.

    d. *Optional.* Specify a **Description**, **Default Value**, and whether the combined parameter is **Read Only**, an **Expert Setting**, or **Hidden**.

       Read Only prevents changes to the parameter value when the aspect is assigned to a configuration item. Hidden also prevents changes, but additionally makes the parameter invisible. Users can choose whether to show expert settings when they make an assignment.

    e. You can set either a specific default value, or you can click **From CI Attribute** and then browse for a CI attribute. When you specify a CI attribute, Operations Management sets the parameter value automatically during deployment of the policy templates, using the actual

    value of this attribute from the CI. You can also set conditional parameter values here.

    f. Click **OK**.

You can also edit the parameters without combining them, to override the defaults in the policy template. Click one parameter, and then click □. The Edit/Combine Parameters dialog box opens.

14. In the Create Aspect wizard, click **Finish** to save the aspect and close the wizard. The new aspect appears in the Management Templates & Aspects pane.

Microsoft SQL Server Aspects

Microsoft SQL Server Aspects comprises policy templates, instrumentation, and parameters for monitoring the health and performance of Microsoft SQL Server databases. Each Microsoft SQL Server Aspect can be used to monitor individual units of Microsoft SQL Server databases.

User Interface Reference

General	Provides an overview of the general attributes of the Microsoft SQLServer Aspects.
CI Type	The type of CIs that the Aspect can be assigned to. This is the type of CI to which the Management Template can be assigned.
Instrumentation	Provides a single package which contains the binaries for discovery, collection, and data logging.
Aspects	Provides an overview of any Aspects that the Microsoft SQLServer Aspect contains. You can expand each item in the list to see more details about the nested aspect. The Microsoft SQLServer Base Aspect is part of all the other Aspects.
Policy Templates	Provides an overview of the policy templates that the Microsoft SQLServer Aspect contains. You can expand each item in the list to see more details about the policy template.

The OMi MP for Microsoft SQL Server comprises the following Microsoft SQL Server Aspects:

Microsoft SQL Server Availability

This Aspect monitors the Microsoft SQL Server database connection status and services.

CI Type	Policy Template	Policy Description	Policy Type
SQL Server	MSSQLServer_ 3028	Monitors the number of databases marked as suspect.	Measurement Threshold Template
	MSSQLServer_ 3030	Monitors the ability to connect to a server.	
	MSSQLServer_ 3057	Monitors the SQL Server services.	
	MSSQLServer_ 3058	Monitors the SQL Agent service.	
	MSSQLServer_ 3230	Monitors the ability to connect to a database.	
	MSSQLServer_ 3243	Monitors the availability of Microsoft SQL Server and reports uptime information.	ConfigFile Template

Microsoft SQL Server Backup

This Aspect monitors the database and transaction log backups.

CI Type	Policy Template	Policy Description	Policy Type
SQL Server	MSSQLServer_ 3233	Monitors the number of hours since the last database backup.	Measurement Threshold Template
SQL Server	MSSQLServer_ 3234	Monitors the number of hours since the last database transaction log backup.	

Microsoft SQL Server Base

This is the base Aspect for monitoring Microsoft SQL Server database.

CI Type	Policy Template	Policy Description	Policy Type
SQL Server	MSSQLServer_ Configuration	This policy is used to update user configuration.	ConfigFile Template
	MSSQLServer_ High	Runs the MSSQL DBSPI collector every 15 minutes with the high frequency metrics.	Scheduled Task Template

CI Type	Policy Template	Policy Description	Policy Type
	MSSQLServer_ Logger	Monitors the MSSQL Server logger data feed every 5 minutes.	
	MSSQLServer_ Low	Runs the MSSQL DBSPI collector on a low schedule.	
	MSSQLServer_ Medium	Runs the MSSQL DBSPI collector on a medium schedule.	
	MSSQLServer_ VeryHigh	Runs the MSSQL DBSPI collector on a very high schedule.	
	MSSQLServer_ Messages	Runs the MSSQL Server Message Interceptor policy.	Open Message Interface Template

Microsoft SQL Server Data Access Methods

This Aspect monitors the amount of data, indexes, and free space in a database.

CI Type	Policy Template	Policy Description	Policy Type
SQL Server	MSSQLServer_ 3051	Monitors the full scans rate.	Measurement Threshold Template
	MSSQLServer_ 3052	Monitors the index searches rate.	
	MSSQLServer_ 3053	Monitors the pages allocated rate.	
	MSSQLServer_ 3054	Monitors the extents allocated rate.	
	MSSQLServer_ 3055	Monitors the page splits rate.	
	MSSQLServer_ 3056	Monitors the table lock escalation rate.	

Microsoft SQL Server Database Mirroring

This Aspect monitors the data flow in a database mirroring session.

CI Type	Policy Template	Policy Description	Policy Type
SQL Server	MSSQLServer_3084	Monitors the mirroring state of the Microsoft SQL Server instance.	Measurement Threshold Template
	MSSQLServer_3085	Monitors the unsent log on the principal.	
	MSSQLServer_3086	Monitors the unrestored log on the mirror.	
	MSSQLServer_3087	Monitors the log generation rate on the principal.	
	MSSQLServer_3088	Monitors the current send rate on the principal.	

Microsoft SQL Server Discovery

This Aspect discovers Microsoft SQL Server standalone instances and failover cluster instances, databases, services, and so on.

CI Type	Policy Template	Policy Description	Policy Type
SQLServer Computer	MSSQLServer_Discovery	Runs the MSSQLServer_Discovery policy.	Service Auto-Discovery Template
	MSSQLServer_DeepDiscovery	Runs the MSSQLServer_DeepDiscovery once in a day.	Schedule Task Template

Microsoft SQL Server Error

This Aspect monitors the activity of Microsoft SQL Servers such as Read/Write errors, packet errors, and logfiles.

CI Type	Policy Template	Policy Description	Policy Type
SQL Server	MSSQL_3023	Monitors the number of SQL server read/write errors since the last probing.	Measurement Threshold Template
	MSSQL_3024	Monitors the number of packet errors while reading or writing packets.	
	MSSQLServer_	Forwards application log entries with	Windows Event Log

CI Type	Policy Template	Policy Description	Policy Type
	EventLog_Errors	severity error.	Template
	MSSQLServer_ EventLog_Warnings	Forwards application log entries with severity warning.	
	MSSQLServer_ AlertLog	Monitors the MSSQL Server log file.	Logfile Entry Template

Microsoft SQL Server IO Utilization

This Aspect monitors the Input Output statistics such as outstanding reads and write rate.

CI Type	Policy Template	Policy Description	Policy Type
SQL Server	MSSQLServer_3007	Monitors the number of read requests issues to the operating system that are not completed.	Measurement Threshold Template
	MSSQLServer_3008	Monitors the number of write requests issues to the operating system that are not completed.	
	MSSQLServer_3227	Monitors the percentage of physical I/O used by process ID.	
	MSSQLServer_3244	Monitors the number of physical reads and writes to the disk since the last collection for each tablespace.	ConfigFile Template

Microsoft SQL Server Jobs

This Aspect monitors the jobs running on an SQL Server instance by using SQL Server Agent.

CI Type	Policy Template	Policy Description	Policy Type
SQL Server	MSSQLServer_ 3277	Reports the failed and cancelled jobs.	Measurement Threshold Template

Microsoft SQL Server Latches

This Aspect monitors the latches to determine user activity and resource usage that help you to identify performance bottlenecks.

CI Type	Policy Template	Policy Description	Policy Type
SQL Server	MSSQLServer_3068	Monitors the latch waits rate.	Measurement Threshold Template
	MSSQLServer_3069	Monitors the average latch wait time.	
	MSSQLServer_3076	Monitors the current average latch wait time.	

Microsoft SQL Server Locks

This Aspect monitors the SQL Server lock resources accessed by concurrent transactions.

CI Type	Policy Template	Policy Description	Policy Type
SQLServer	MSSQL_3013	Monitors the percentage of locks in use.	Measurement Threshold Template
	MSSQL_3070	Monitors the lock timeout rate.	
	MSSQL_3071	Monitors the deadlocks rate.	
	MSSQL_3072	Monitors the locks wait rate.	
	MSSQL_3073	Monitors the average lock wait time.	
	MSSQL_3075	Monitors the percentage of lock memory in use.	
	MSSQL_3270	Monitors the lock timeout rate per object type.	
	MSSQL_3271	Monitors the deadlock rate per object type.	
	MSSQL_3272	Monitors the locks wait rate per object type.	

CI Type	Policy Template	Policy Description	Policy Type
	MSSQL_3273	Monitors the lock wait time per object type.	

Microsoft SQL Server LogShipping

This Aspect monitors backing up the transaction logs from a primary database and then copying and restoring them to a secondary database.

CI Type	Policy Template	Policy Description	Policy Type
SQLServer	MSSQLServer_3291	Monitors backup job in primary instance of logshipping configuration.	Measurement Threshold Template
	MSSQLServer_3292	Monitors copy backup job in secondary instance of logshipping configuration.	
	MSSQLServer_3293	Monitors restore job in secondary instance of logshipping configuration.	

Microsoft SQL Server Processes and Statistics

This Aspect monitors the Microsoft SQL Server database processes and statistics such as CPU usage, LRU statistics, SQL statistics, runnable connections, and blocked processes.

CI Type	Policy Template	Policy Description	Policy Type
SQL Server	MSSQLServer_ 3001	Monitors the number of times a data page is found in the cache.	Measurement Threshold Template
	MSSQLServer_ 3011	Monitors the number of current users that are connected.	
	MSSQLServer_ 3014	Monitors the number of blocked processes.	
	MSSQLServer_ 3017	Monitors the percentage of command queue length used.	
	MSSQLServer_ 3025	Monitors the percentage of CPU time used by SQL Server.	

CI Type	Policy Template	Policy Description	Policy Type
	MSSQLServer_3026	Monitors the percentage of total connections that are active versus sleeping.	
	MSSQLServer_3032	Monitors the percentage of connections that are runnable.	
	MSSQLServer_3074	Monitors the batch requests rate.	

Microsoft SQL Server Replication

This Aspect monitors copying and distributing data and database objects from one database to another and then synchronizing between databases.

CI Type	Policy Template	Policy Description	Policy Type
SQL Server	MSSQLServer_3081	Monitors the replication agents status.	Measurement Threshold Template
	MSSQLServer_3082	Monitors the replication latency.	
	MSSQLServer_3083	Monitors the delivery latency.	
	MSSQLServer_3403	Monitors the elapsed time in seconds.	
	MSSQLServer_3404	Monitors the number of conflicts per second.	
	MSSQLServer_3411	Monitors the elapsed time in seconds.	

Microsoft SQL Server Reports

This Aspect monitors the SQL Server failed reports.

CI Type	Policy Template	Policy Description	Policy Type
SQLServer	MSSQLServer_3080	Monitors the number of failed reports	Measurement Threshold Template
	MSSQLServer_3280	Monitors the number of failed reports(drill down)	

Microsoft SQL Server Space

This Aspect monitors the SQL Server space utilization such as virtual device space, database space, and filegroup free space.

CI Type	Policy Template	Policy Description	Policy Type
SQLServer	MSSQLServer_ 3215	Monitors the percentage of space used on a specific virtual device.	Measurement Threshold Template
	MSSQLServer_ 3216	Monitors the percentage of transaction log space used for each database.	
	MSSQLServer_ 3218	Monitors the percentage of database space used.	
	MSSQLServer_ 3240	Monitors the free and allocated database size in MB.	ConfigFile Template
	MSSQLServer_ 3241	Monitors the free and allocated table size in MB.	
	MSSQLServer_ 3242	Monitors the virtual device size that is allocated in MB.	
	MSSQLServer_ 3278	Monitors the percentage of space used per filegroup and database.	Measurement Threshold Template
	MSSQLServer_ 3279	Monitors the space free per filegroup per database.	

Microsoft SQL Server Transactions

This Aspect monitors the Microsoft SQL Server transactions rate, log shrink, and log growths.

CI Type	Policy Template	Policy Description	Policy Type
SQL Server	MSSQLServer_ 3009	Monitors the server transaction rate.	Measurement Threshold Template
	MSSQLServer_ 3035	Monitors the long running transaction.	
	MSSQLServer_ 3064	Monitors the number of active transactions for the entire server.	

CI Type	Policy Template	Policy Description	Policy Type
	MSSQLServer_ 3066	Monitors the transactions log expansions for the server.	
	MSSQLServer_ 3067	Monitors the number of transactions log shrinks for the server.	
	MSSQLServer_ 3209	Monitors the database transaction rate.	
	MSSQLServer_ 3264	Monitors the number of active transactions for each database.	
	MSSQLServer_ 3266	Monitors the number of transactions log expansions per database.	
	MSSQLServer_ 3267	Monitors the number of transactions log shrinks per database.	

Microsoft SQL Server Used Defined Aspects

This Aspect discovers the Microsoft SQL Server standalone instances and failover cluster instances, databases, and services.

CI Type	Policy Template	Policy Description	Policy Type
SQLServer	MSSQLServer_ 37XX	UDM monitor metric 37XX.	Measurement Threshold Template
	MSSQLServer_ UDM	Sample to create User Defined Metrics.	ConfigFile Template

Microsoft SQL Server Availability (Agentless)

CI Type	Policy Template	Policy Description	Policy Type
SQL Server	MSSQLServer_Availability	This policy monitors Microsoft SQL Server Connection status remotely.	SiteScope Template

Microsoft SQL Server Response Time (Agentless)

This Aspect monitors the Microsoft SQL Server Response Time remotely.

CI Type	Policy Template	Policy Description	Policy Type
SQL Server	MSSQLServer_ ReponseTime	Monitors Microsoft SQL Server Response Time remotely.	SiteScope Template

Parameters

Parameters are variables that are an integral component of Microsoft SQL Server Management Templates, Microsoft SQL Server Aspects, and Policy Templates. Each parameter corresponds to a variable. Parameters contain default values that are used for monitoring the different components of Microsoft SQL Server databases. You can also modify the values of the variables to suit your monitoring requirements.

Types of Parameters

The parameters are grouped as follows:

- **Instance Parameters** - These parameters are essential for monitoring Microsoft SQL Server CIs. For example, Microsoft SQL Server instance name is an Instance Parameter.

- **Mandatory Parameters** - These parameters contain the essential information required by policy templates. For example, Microsoft SQL Server instance name is a mandatory parameter.

- **Dependent Parameters** - There are some parameters which are a subset of the mandatory parameters. Such parameters are referred to as dependent parameters. For example, Microsoft SQL Server username is a dependent parameter of Microsoft SQL Server instance name.

- **Expert Parameters** - These parameters can be used by SMEs and Administrators.

Microsoft SQL Server Parameters

OMi MP for Microsoft SQL Server contains the following parameters:

Parameter	Parameter Type	Description	Default Values
MSSQL Server Instance Name	Mandatory	Microsoft SQL Server Instance Name that must be monitored.	CI Name
MSSQL Server Instance User	Dependent	Microsoft SQL Server User Name with the required privileges to collect data.	

Parameter	Parameter Type	Description	Default Values
Name			
MSSQL Server Instance Password	Dependent	Password for Microsoft SQL Server User Name.	
Filter	Expert	Filter the monitored components. For example, Microsoft SQL Server Segment Filter parameter filters the segments for monitoring.	
MSSQL Server Instance Collection	Expert	Turn on or off collection for Microsoft SQL Server Instance.	ON
MSSQL Server Instance Tracing	Expert	Enable Tracing on or off for trace to be captured on node at `%ovdatadir%/dbspi/log/trace`.	OFF
Frequency of High Scheduler	Expert	Frequency for the scheduler which is expected to run for high intervals (in minutes).	15
Frequency of Low Scheduler	Expert	Frequency for the scheduler which is expected to run for short intervals (in hours).	24
Frequency of Medium Scheduler	Expert	Frequency for the scheduler which is expected to run for medium intervals (in hours).	1
Frequency of Very High Scheduler	Expert	Frequency for the scheduler which is expected to run for very high intervals (in minutes).	5
Frequency	Mandatory	Frequency of monitoring by a policy template. For example, the frequency of monitoring MSSQL Server Database availability.	
Threshold	Mandatory	Threshold of a policy template. For example, the threshold of monitoring available database nodes.	
Severity	Mandatory	Severity level of a policy template. For example, the severity of monitoring critical database nodes count.	

Tuning Parameters

You can edit the parameters of the Microsoft SQL Server Management Templates that are already deployed to the CIs. To edit the parameters, follow these steps:

1. Open the Assignments & Tuning pane:

   On BSM, click **Admin > Operations Management > Monitoring > Assignments & Tuning**.

   On OMi, click **Administration > Monitoring > Assignments & Tuning**.

2. In the **Browse Views** tab, select the **MSSQL_Database_Deployment** view that contains the CI for which you want to tune parameters. Alternatively, you can use the **Search** tab to find a CI.

3. In the list of Microsoft SQL Server CIs, click a CI. The Assignments pane shows details of any existing assignments for the Microsoft SQL Server CI.

4. Click the assignment for which you want to tune parameters. The Assignment Details pane shows the current parameter values.

5. In the Assignment Details pane, change the parameters:

   a. *Optional.* By default, the list shows only mandatory parameters. To see all parameters, click ▼.

   b. Select a parameter in the list, and then click 🖉.

      - For standard parameters, the Edit Parameter dialog box opens.

        Click **Value**, specify the value, and then click **OK**.

      - For instance parameters, the Edit Instance Parameter dialog box opens.

        Change the instance values if necessary, and then for each instance value, change dependent parameter values. After you change the instances and dependent parameter values, click **OK**.

6. In the Details of Assignment pane, click **Save Changes**. Operations Management deploys the new parameter values to the relevant HPE Operation Agents.

Configuration Item (CI) and Configuration Item Types(CITs)

Configuration Items (CIs) are components that need to be managed in order to deliver an IT Service. For example, IT Services, hardware and software are CIs.

Configuration Item Type (CIT) describes the type of a CI and its attributes. The Microsoft SQL Server CIs that are discovered in an environment are grouped under the corresponding CITs. OMi MP for Microsoft SQL Server comprises the following CITs:

- MSSQL Database

- SQL Server

- FailoverCluster

# Run-time Service Model (RTSM) Views

A view enables you to build and visualize a subset of the overall CI model that comprises Microsoft SQL Server CITs related to specific area of interest.

How to Access RTSM Views

1. Open the Modeling Studio pane:

   On BSM, click **Admin > RTSM Administration > Modeling > Modeling Studio**.

   On OMi, click **Administration > RTSM Administration > Modeling > Modeling Studio**.

2. Click **Resource Type** as Views.

3. Click **Operations Management > Databases** from the list.

By default, OMi MP for Microsoft SQL Server includes the following Views:

- **MSSQL_Deployment:** This view refers to the SQL Server, File System, and Computer CI type. The following image shows the relationship among the CI types.
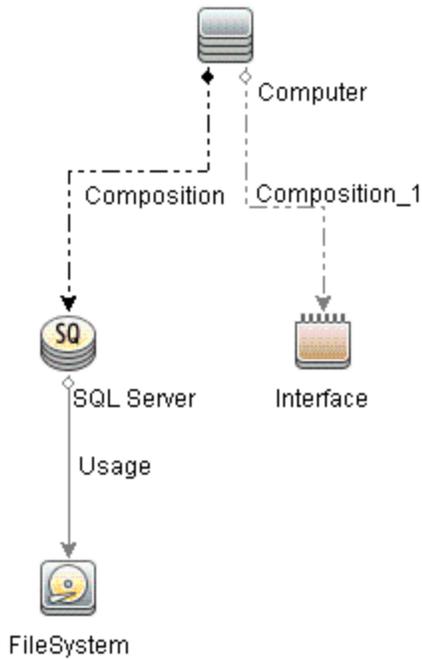
- **MSSQL_Network_Deployment:** This view refers to the SQL Server, File System, Node, and Interface CI type. The following image shows the relationship among the CI types.
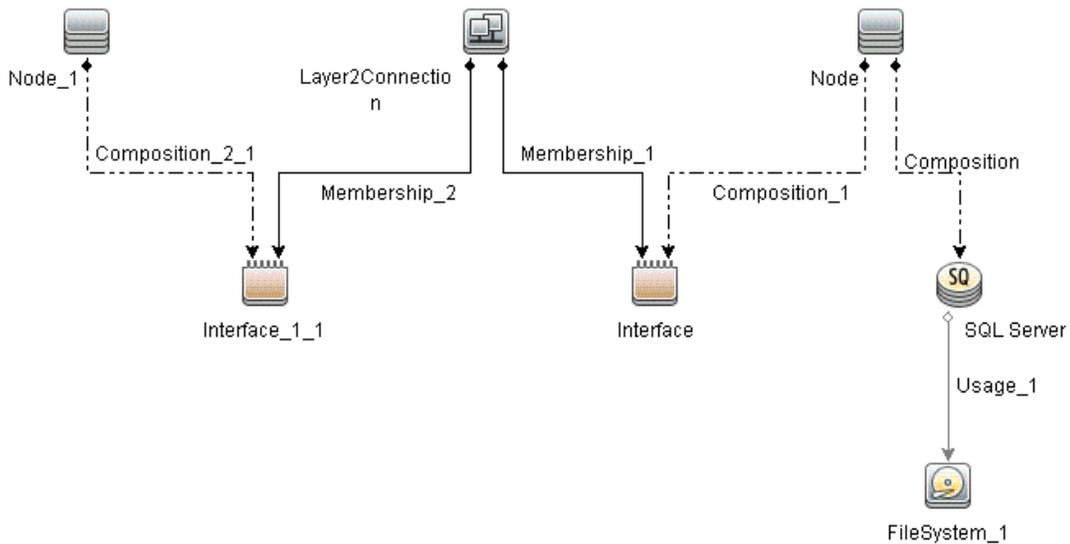
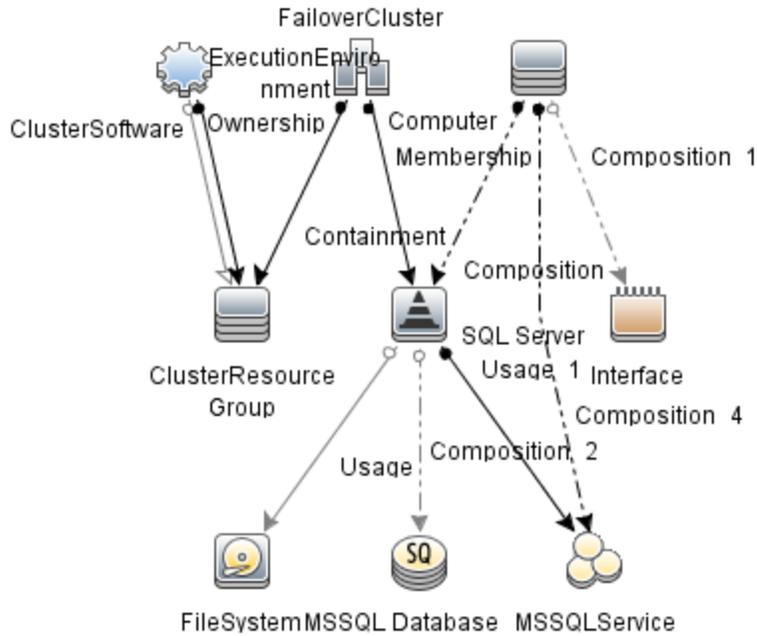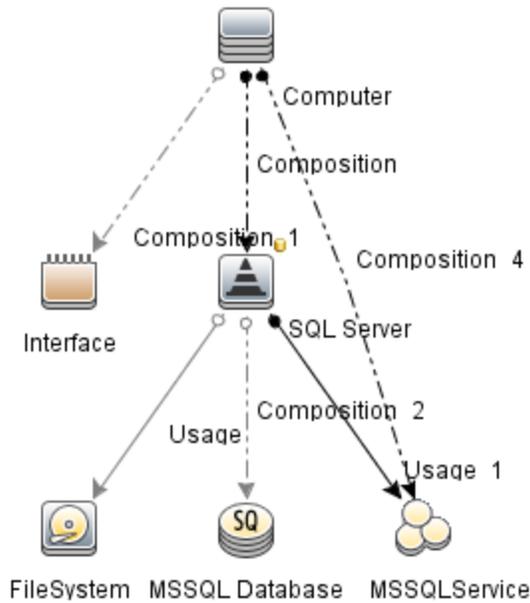- ○ **MSSQL_Cluster_Deployment:** This view refers to the cluster deployment and shows the FailoverCluster CIT.

- **MSSQL_Database_Deployment**: This view refers to the database deployment and shows the SQL Server CIT.

Health Indicators

Health Indicators (HIs) analyze the events that occur in Microsoft SQL Server CIs and report the health of the Microsoft SQL Server CIs. The OMi MP for Microsoft SQL Server includes the following HIs to monitor Microsoft SQL Server-related events:

How to Access Health Indicators

1. Open the Indicators pane:

   On BSM, click **Admin > Operations Management > Monitoring > Indicators**.

   On OMi, click **Administration > Service Health > CI Status Calculation > Health- and Event Type Indicators**.

2. In the CI Type pane:

   ○ For SQL Server, click **ConfigurationItem > InfrastructureElement > RunningSoftware > Database > SQL Server**.

   ○ For MSSQL Database, click **ConfigurationItem > InfrastructureElement > Application Resource > Database Resource > Database Schema > MSSQL Database**

CI Type	HI	Description	Value
MSSQLDatabase	MSSQL Database Transaction Log Usage Level	Indicates the availability of SQL Server instance as affected by the percentage of transaction log space used in MSSQL database.	Normal High
	MSSQL Database Space Usage Level	Indicates the availability of database in the SQL Server instance affected by the percentage of transaction log space used in MSSQL database.	Normal High
	MSSQL Server Filegroup Space Usage Level	Indicates availability of a database in the SQL Server instance as the percentage of space used per filegroup per database	Broken Failed Up
	MSSQL Database Status	Indicates the availability of an MSSQL database in an SQL Server instance.	Down Up

CI Type	HI	Description	Value
	MSSQL Database Mirroring Status	Indicates mirroring state of the SQL Server database.	Normal Warning
	MSSQL Database Transaction Rate	Indicates the rate of transactions for MSSQL database.	High Normal
SQL Server	MSSQL Server CPU Usage by SQL	Indicates SQL statements with high CPU time per execution.	High Normal
	Cache Performance	Indicates cache hit percentage.	Low Normal
	Database Deadlock Rate	Indicates the performance of a SQL Server instance based on the rate of deadlocks in the database.	High Normal
	Database Mirroring Status	Indicates mirroring state of the SQL Server.	Normal Warning
	Database FileGroup Space Usage Level	Indicates availability of a database in the SQL Server Instance as the percentage of space used per filegroup per database and the percentage of space available per filegroup per database.	High Medium Normal
	Database Latch Wait Rate	Indicates the performance of an SQL Server instance based on number of latch waits.	High Normal
	Database Lock Timeout Rate	Indicates the performance of a SQL Server instance based on the rate of deadlocks in the database.	High Normal
	Database Mirroring Transaction Delay	Indicates the delay in waiting for unterminated commit acknowledgement.	High Normal
	Database Reads Outstanding	Indicates the performance of a SQL Server instance with respect to the number of outstanding read requests to the host operating system.	High Normal

CI Type	HI	Description	Value
	Database Status	Indicates the availability of a database in an SQL Server Instance.	Down Up
	Database Space Usage Level	Indicates availability of database in the SQL Server Instance as the percentage of database space used.	High Normal
	Inactive Database Connections	Indicates the total number of connections that are active versus sleeping in an SQL Server instance.	High Normal
	Database Writes Outstanding	Indicates the performance of a SQL Server instance with respect to the number of outstanding write requests to the host operating system.	High Normal
	Lock Memory Used Pct	Indicates percentage of used lock memory.	High Normal
	Lock Wait Rate	Indicates number of lock requests per second that could not be satisfied immediately and required the caller to wait, for all object types combined: Extent, Key, Page, Table, RID, database. Also indicates number of lock requests per second that resulted in a deadlock.	High Normal
	Locks in Use Percentage	Indicates percentage total locks currently held to the total number of locks configured for SQL Server.	High Normal
	Merge Conflicts	Indicates the number of conflicts per second during publisher or subscriber upload or download in an SQL Server instance.	High Normal Medium
	MSSQL Server Query Performance	Indicates SQL statements with high elapsed time per execution.	Low Normal
	MSSQL Server SQL Query Tuning	Indicates MSSQL Server SQL statements with low query tuning.	Normal Low
	MSSQL Server Replication Status	Indicates database server replication status.	Broken Failed Up

CI Type	HI	Description	Value
	MSSQL Server Status	Indicates MSSQL server availability.	Down Up
	Database Mirroring Status	Indicates mirroring state of the SQL Server database.	Normal Warning
	Database Transaction Rate	Indicates the rate of transactions for the entire database server.	High Normal
	SQL Server Databases Data File Size	Indicates the cumulative size of all the data files in the database including any automatic growth.	High Normal
	MSSQL Server Transaction Rate	Indicates Number transactions started for the database per second.	High Normal
	SQL Server Service Status	Indicates the availability of a SQL Server Service that corresponds to a given SQL Server Instance.	Down Up
	Transaction Log Usage Level	Indicates the availability of an SQL Server instance as affected by the percentage of transaction log space used.	High Normal
	Users Connected Percentage	Indicates percentage of the current user connections to the total number of user connections configured for SQL Server.	High Medium Normal
	SQL Server Active Cursor	Indicates Microsoft SQL Server active cursors.	High Normal
	SQL Server Cursor Memory Usage	Indicates amount of memory consumed by cursors.	High Normal
	SQL Server Database Active Transactions	Indicates the number of active transactions with the database.	High Normal
	SQL Server	Indicates the cumulative size of all the data files	High

CI Type	HI	Description	Value
	Databases Data File Size	in the database including any automatic growth.	Normal
	SQLServer Databases Transaction Rate	Indicates Number transactions started for the database per second.	High Normal
	SQL Server Service Status	Indicates the availability of a SQL Server Service that corresponds to a given SQL Server Instance.	Down Up
	Runnable Workers Ratio	Indicates the ratio between SQL server workers running and workers potentially runnable.	Normal FullCapacity High
	Virtual Device Space Usage Level	Indicates percentage of space used on a virtual device.	High Medium Normal

Event Type Indicators

Event Type Indicators (ETIs) are categorization of events based on the type of occurrence. The OMi Management Pack for Microsoft SQL Server includes the following ETIs to monitor Microsoft SQL Server-related events:

How to Access Event Type Indicators

1. Open the Indicators pane:

   On BSM, click **Admin > Operations Management > Monitoring > Indicators**.

   On OMi, click **Administration > Service Health > CI Status Calculation > Health- and Event Type Indicators**.

2. In the CI Type pane:

   o For SQL Server, click **ConfigurationItem > InfrastructureElement > RunningSoftware > Database > SQL Server**.

   o For MSSQL Database, click **Configuration Item > Infrastructure Element > Application Resource > Database Resource > Database Schema > MSSQL Database**

CI Type	ETI	Description	Value
SQL Server	Database Mirroring Status	Indicates mirroring state of the SQL Server.	Normal
SQL Server	Inactive Database Connections	Indicates the number of total active and sleeping connections in a SQL Server instance.	Normal
SQL Server	Merge Conflicts	Indicates the number of conflicts per second during Publisher or Subscriber upload and download in a SQL Server instance.	Normal
Database	MSSQL Server Query Tuning	Indicates SQL statements with low query tuning.	Normal
SQL Server	SQL Server Disk Read/Write Errors	Indicates SQL Server disk read/write errors.	Normal

Note: The CITs from Operations Manager (OM) are mapped to Run-time Service Model (RTSM) in OMi using the OMi MP for Microsoft SQL Server.

Policies Setting ETIs and HIs

The following table lists the ETIs and HIs. It also lists the OMi MP for Microsoft SQL Server Policy Templates that set the ETIs and HIs.

ETI/HI	Policy Name	Policy Description
Cache Performance	MicrosoftSQLServer_ 3001	Percentage of times a data page is found in the cache.
MSSQL Server CPU Usage by SQL	MicrosoftSQLServer_ 3025	CPU time percentage used by Microsoft SQL Server.
MSSQL Database Mirroring Status	MicrosoftSQLServer_ 3084	Mirroring state of the Server instance.
	MicrosoftSQLServer_ 3085	Unsent log on the principle.
	MicrosoftSQLServer_ 3086	Unrestored log on the mirror.

ETI/HI	Policy Name	Policy Description
MSSQL Database Space Usage Level	MicrosoftSQLServer_ 3218	Percentage of database space used.
MSSQL Database Status	MicrosoftSQLServer_ 3230	Number of databases marked as suspect.
MSSQL Server Status	MicrosoftSQLServer_ 3030	Ability to connect to a database.
SQL Server Disk ReadWrite Errors	MicrosoftSQLServer_ 3023	Number of Microsoft SQL Server read or write errors since the last probing.
	MicrosoftSQLServer_ 3024	Number of packet errors while reading or writing packets.
Locks in Use Percentage	MicrosoftSQLServer_ 3013	Percentage total locks currently held to the total number of locks configured for Microsoft SQL Server.
Lock Memory Used Percentage	MicrosoftSQLServer_ 3075	Percentage of lock memory in use.
Database Lock Timeout Rate	MicrosoftSQLServer_ 3070	Lock timeout rate.
Lock Wait Rate	MicrosoftSQLServer_ 3072	Locks wait rate.
MSSQL Server Replication Status	MicrosoftSQLServer_ 3081	Replication agents status.
SQL Server Service Status	MicrosoftSQLServer_ 3057	Checks the status of SQL Server service.
	MicrosoftSQLServer_ 3058	Checks the status of the SQL Agent service.
MSSQL Server SQL Query Performance	MicrosoftSQLServer_ 3035	Checks the Long running transaction.
MSSQL Query Tuning	MicrosoftSQLServer_ 3051	Checks the Full scans rate.
	MicrosoftSQLServer_ 3052	Checks the Index searches rate.
	MicrosoftSQLServer_ 3053	Pages allocation rate.

ETI/HI	Policy Name	Policy Description
	MicrosoftSQLServer_3054	Checks the Extents allocation rate.
	MicrosoftSQLServer_3055	Checks the Page splits rate.
Users Connected Percentage	MicrosoftSQLServer_3011	Percentage of current users connected.
Virtual Device Space Used	MicrosoftSQLServer_3215	Percentage of space used on a specific virtual device.

Topology Based Event Correlation (TBEC) Rules

The OMi MP for Microsoft SQL Server includes the following rules to correlate Microsoft SQL Server-related events.

For more information on how the correlation rules work, see the *Operations Manager i Concepts Guide*.

How to Access TBEC Rules

On BSM, click **Admin > Operations Management > Event Correlation > Topology-Based Event Correlation**.

On OMi, click **Administration > Event Processing > Correlation > Topology-Based Event Correlation**.

Database::FileSystem:SQLServer Space Usage Level HIs > Disk Usage Level

Description: Correlates the high usage of Virtual Device Space by Microsoft SQL Server to near capacity disk usage level of FileSystem		
Cause		
CIT: SQL server	ETI: Database Space Usage Level	Value: High
Symptom		
CIT: File System	ETI: Disk Usage Level	Value: Near Capacity

Database::FileSystem:SQLServer Transaction Log Usage Level HIs >> Disk Usage Level

Description: Correlates the high usage of Virtual Device Space by Microsoft SQL Server to near capacity disk usage level of FileSystem		
Cause		

Description: Correlates the high usage of Virtual Device Space by Microsoft SQL Server to near capacity disk usage level of FileSystem		
CIT: SQL server	ETI: Transaction Log Usage Level	Value: High
Symptom		
CIT: File System	ETI: Disk Usage Level	Value: Near Capacity

Database::FileSystem:SQLServer Virtual Device Space Usage Level HIs >> Disk Usage Level

Description: Correlates the high usage of Virtual Device Space by Microsoft SQL Server to near capacity disk usage level of FileSystem		
Cause		
CIT: SQL server	ETI: Virtual Device Space Usage Level	Value: High
Symptom		
CIT: File System	ETI: Disk Usage Level	Value: Near Capacity

Database::FileSystem:SQLServer FileGroup Space Usage Level HIs >> Disk Usage Level

Description: Correlates the high usage of Virtual Device Space by Microsoft SQL Server to near capacity disk usage level of FileSystem		
Cause		
CIT: SQL server	ETI: Database FileGroup Space Usage Level	Value: High
Symptom		
CIT: File System	ETI: Disk Usage Level	Value: Near Capacity

Database::Interface: InterfaceCommunicationStatus >> SQLServer Database Packet Error

Description: Correlates Interface Communication Status of node to Microsoft SQL Server Database Packet Error		
Cause 1		
CIT: Interface	ETI: Interface Communication Status	Value: Unavailable
Cause 2		
CIT: Interface	ETI: Interface Discard Rate	Value: High
Cause 3		

Description: Correlates Interface Communication Status of node to Microsoft SQL Server Database Packet Error		
CIT: Interface	ETI: Interface Error Rate	Value: High
Symptom		
CIT: SQL Server	ETI: SQL Server Disk ReadWrite Errors	Value: High

Operations Orchestration Flows

Operations Orchestration (OO) provides OO flows that enable IT process automation and run book automation. For more information, see the *HPE Operations Orchestration* documentation. The following section provides information about using OO flows for OMi MP for Microsoft SQL Server.

When creating the mapping for the OO flows, you can set default values for the attributes listed in the following table. You need not specify these values each time you run the OO flows.

How to upload OO flows

To upload OO Flows from OMi MP for Microsoft SQL Server, follow these steps:

1. In BSM, go to the directory:

   `<HPBSM_Root_Directory>/conf/opr/oo`

2. Copy the required OO JAR file to a temporary location on a system where OO Studio (version 07.51.02 or greater) is installed.

   The file names can be one of the following:

   `HPOprOO<content_name>.jar`

   For OO Studio version 09.00:

   `HPOprOOMss90.jar` for Microsoft SQL Server

   To install and upload the OO flows run the command:

   `java -jar -Xmx1024m "<temp>/HPOprOO<content_name>" -centralPassword <centralpassword>`

   For example:

   `java -jar -Xmx1024m "<temp>/HPOprOOMss90" -centralPassword <centralpassword>`

> **Note:** If the admin user in OO is not the default user, another parameter is required. For further details about installing content and the options available, see the OO Software Development Kit Guide.

Using OO Studio, the uploaded OO flows can be accessed under:

../Library/Operations Management/..

3. From OMi, complete the mapping of OO flows to CIs and map the OO flow input variables to CI attributes using:

   On BSM, click **Admin > Integration > Operations Orchestration**.

   On OMi, click **Administration > Operations Console > Run Books Mapping**.

Attribute	Description
omServerPort	Port number of the OM Tool WS.
omServerUser	User name for the OM Server that will use used in the OM Tool WS.
omServerPassword	Password for the OM Server that will use used in the OM Tool WS.

The following section lists the Microsoft SQL Server OO flows:

SQL Server Health Check

You can use this flow to check the health of a Microsoft SQL Server. The flow checks if the value of **% of Current Users Connected** for Microsoft SQL Server is above the specified threshold.

> **Note:** You can run this flow only on the Microsoft SQL Server, which is monitored by OM Smart Plug-in for Microsoft SQL Server.

You must map this flow to the CIT **sqlserver**.

The following table lists the user input items when executing this OO flow.

Flow input	Description
omNode	FQDN of the node. This must be a managed node for the OM Server and must be specified each time you run the OO flow.
sqlServerName	Name of the Microsoft SQL Server.
SqlConnectionPCT_ Threshold	The threshold value for **% of Current Users Connected** for Microsoft SQL Server. This is an optional attribute and the default value is 98.
timeout	Timeout value to be used when running the remote command on the node. This is an optional attribute and the default value is 100000.

Flow input	Description
omServer	FQDN of the OM Server. You can map this input to the Event attribute **Originating Server**.

SQL Server Performance Check

You can use this flow to check the performance of a Microsoft SQL Server.

This flow checks the following:

- If the Microsoft SQL Server CPU Utilization is above the specified threshold.

- If the Microsoft SQL Server Cache Hit Percentage is below the specified threshold.

- If the Microsoft SQL Server Lock Wait Rate is above the specified threshold.

- If the Microsoft SQL Server Writes Outstanding Rate is above the specified threshold.

- If the Microsoft SQL Server Reads Outstanding Rate is above the specified threshold.

Note: You can run this flow only on the Microsoft SQL Server, which is monitored by OM Smart Plug-in for Microsoft SQL Server.

You must map this flow to the CIT **sqlserver**.

The following table lists the user input items when executing this OO flow.

Flow input	Description
omNode	FQDN of the node. This must be a managed node for the OM Server and must be specified each time you run the OO flow.
ServerWriteOutstanding_ Threshold	Threshold value for **Writes Outstanding Rate** for Microsoft SQL Server. This is an optional attribute.
ServerReadOutstanding_ Threshold	Threshold value for **Reads Outstanding Rate** for Microsoft SQL Server. This is an optional attribute.
ServerCPU_PCT_ Threshold	Threshold value for **% CPU Time Used** by Microsoft SQL Server. This is an optional attribute.
ServerCacheHitPCT_ Threshold	Threshold value (minimum) for **Cache Hit Percentage** for Microsoft SQL Server. This is an optional attribute.
ServerLockWaitRate_ Threshold	Threshold value for **Locks Wait Rate** for Microsoft SQL Server. This is an optional attribute.
timeout	Timeout value to be used when running the remote command on the node. This is an optional attribute and the default value is 100000.

Flow input	Description
sqlServerName	Name of the Microsoft SQL Server.
omServer	FQDN of the OM Server. You can map this input to the Event attribute **Originating Server**.

Tools

The OMi MP for Microsoft SQL Server contains the following tools mapped to the SQL Server CIT and the Database Operational Tools category. It comprises the following tools:

How to Access Tools

1. Open the Tools pane:

   On BSM, click **Admin > Operations Management > Operations Console > Tools**.

   On OMi, click **Administration > Operations Console > Tools**.

2. In CI Types pane:

   ○ For SQL Server CIs, click **ConfigurationItem > InfrastructureElement > RunningSoftware > Database > SQL Server**.

   ○ For Computer CIs, click **ConfigurationItem > InfrastructureElement > Node > Computer**.

CI Type	Tool	Description
SQL Server	Create Microsoft SQL Server using Domain Login	Allows Microsoft SQL Server user creation using domain login to connect to the Microsoft SQL Server for monitoring.
	Create Microsoft SQL Server User using Microsoft SQL Server Authentication	Allows Microsoft SQL Server user creation using Microsoft SQL Server Authentication to connect to the Microsoft SQL Server for monitoring.
	Create Microsoft SQL Server User using Microsoft SQL Server Windows Authentication	Allows Microsoft SQL Server user creation using Microsoft SQL Server Windows Authentication to connect to the Microsoft SQL Server for monitoring.
	Microsoft SQL Server Connection Check	Checks the connection of all the Microsoft SQL Servers configured and monitored using OMi MP for Microsoft SQL Server or SPI for

CI Type	Tool	Description
		Microsoft SQL Server.

CI Type	Tool	Description
	Active Connections	Checks the percentage of total connections that are active versus sleeping for Microsoft SQL Server that configured and monitored using OMi MP for Microsoft SQL Server or SPI for Microsoft SQL Server.
	Databases Status	Checks the database status for Microsoft SQL Server that is monitored using or SPI for Microsoft SQL Server.
	Filegroup Space Usage	Checks the space used per filegroup per database of Microsoft SQL Server that are configured and monitored using OMi MP for Microsoft SQL Server or SPI for Microsoft SQL Server.
	Locks Wait Rate	Checks the locks wait rate for Microsoft SQL Server that are configured and monitored using OMi MP for Microsoft SQL Server or SPI for Microsoft SQL Server.
	Microsoft SQL Server Connection Check, checks the connection of the all Microsoft SQL Servers configured to the SPI for Microsoft SQL Server or OMi MP for Microsoft SQL Server.	Checks the connection of the all Microsoft SQL Servers configured and monitored to the SPI for Microsoft SQL Server or OMi MP for Microsoft SQL Server.
	Microsoft SQL Server Documents	Starts a web browser and connects to the Microsoft SQL Server product manuals web site.
	Mirroring Status	Checks the mirroring state of Microsoft SQL Server that are configured and monitored using SPI for Microsoft SQL Server.
	Network Statistics	Checks the network statistics of Microsoft SQL Server that is monitored using OMi MP for Microsoft SQL Server or SPI for Microsoft SQL Server.
	Processes Blocked	Checks the blocked processes of Microsoft SQL Server that are configured and monitored using OMi MP for Microsoft SQL Server or SPI for Microsoft SQL Server.
	Replication Agents Status	Checks the replication agent status of Microsoft SQL Server that are configured and monitored using OMi MP for Microsoft SQL Server or SPI for Microsoft SQL Server.

CI Type	Tool	Description
	Replication Latency	Checks the replication latency status of Microsoft SQL Server that is configured OMi MP for Microsoft SQL Server or SPI for Microsoft SQL Server.
	Server Statistics	Displays statistics of Microsoft SQL Server that are configured using OMi MP for Microsoft SQL Server or SPI for Microsoft SQL Server.
	Server Status	Displays status of Microsoft SQL Server that are configured using OMi MP for Microsoft SQL Server or SPI for Microsoft SQL Server.
	Transaction Log Space Usage	Checks the percentage of transaction log space usage used for each database for Microsoft SQL Servers that are configured using OMi MP for Microsoft SQL Server or SPI for Microsoft SQL Server.
	Transactions Active	Checks the active transactions for the Microsoft SQL Servers
	Users Connected	Checks the current users connected to Microsoft SQL Server that are configured using OMi MP for Microsoft SQL Server or SPI for Microsoft SQL Server.
	Virtual Device Space Usage	Checks the space utilization of a specific virtual device for Microsoft SQL Server configured using OMi MP for Microsoft SQL Server or SPI for Microsoft SQL Server.
Computer	Active Jobs for Microsoft SQL Server	Shows all jobs that are active for Microsoft SQL Server.
	All Jobs for Microsoft SQL Server	Shows all jobs - active, suspended, completed for Microsoft SQL Server.
	Disable Microsoft SQL Server MP Monitoring	Disables OMi MP for Microsoft SQL Server collection and alert notification.
	Disable Microsoft SQL Server MP Trace	Turns OMi MP for Microsoft SQL Server tracing off.
	Disable Microsoft SQL Server MP Error File	Displays the contents of OMi MP for Microsoft SQL Server error file.
	Enable Microsoft SQL Server MP Monitoring	Enables OMi MP for Microsoft SQL Server collection and alert notification.

CI Type	Tool	Description
	Enable Microsoft SQL Server MP Trace	Turns OMi MP for Microsoft SQL Server tracing on.
	List instances for Microsoft SQL Server	List of installed Microsoft SQL Server instances.
	NT Services for Microsoft SQL Server	Shows NT Services that are running.
	Verify Microsoft SQL Server MP Deployment	Shows OMi MP for Microsoft SQL Server deployed files, versions, number of policies, default files, and performs a connection check.
	Run Self-Healing Collector for Microsoft SQL Server MP	Collects error and log information that can be sent to HPE Support for troubleshooting issues.

Chapter 4: Customizing OMi MP for Microsoft SQL Server

OMi MP for Microsoft SQL Server can be customized to suit your monitoring requirements. You can edit the existing Microsoft SQL Server Management Templates or create new Microsoft SQL Server Management Templates to monitor any database environment.

Customizing Microsoft SQL Server Management Templates before Deployment

You can customize OMi MP for Microsoft SQL Server to optimally and seamlessly monitor the Microsoft SQL Server databases in your environment. OMi MP for Microsoft SQL Server provides the following customization scenarios:

- Creating Microsoft SQL Server Management Templates
- Editing Microsoft SQL Server Management Templates
- User Defined Metrics

Creating Microsoft SQL Server Management Templates

1. Open the Management Templates & Aspects pane:

   On BSM, click **Admin > Operations Management > Monitoring > Management Templates & Aspects**.

   On OMi, click **Administration > Monitoring > Management Templates & Aspects**.

2. In the Configuration Folders pane:

   Configuration Folders > Database Management > Microsoft SQL Server

3. Select the Microsoft SQL Server configuration folder and if you need to create a new configuration

folder, click ✳. The Create Configuration Folder opens.

4. Type the name of the new configuration folder and the description. For example, you can type the new configuration folder name as Test.

5. Click **OK**. The new configuration folder is created.

   Configuration Folders > Database Management > Microsoft SQL Server > Test

6. In the Management Templates & Aspects pane, select the new configuration folder and click ✳ and then click ✳ **Management Template**. The Create Management Template wizard opens.

7. In the General page, type a **Name** for the new Microsoft SQL Server Management Template.

   Click **Next**.

8. A Microsoft SQL Server Management Template enables you to manage Microsoft SQL Server configuration items and all the related dependent CIs. Select **MSSQL_Deployment** from the list as the Topology View. The MSSQL_Deployment shows the Microsoft SQL Server CIs and all the related CI types.

9. Click an item in the topology map to select the **CI Type** of the configuration items that this Management Template enables you to manage. This is the type of CI to which the Management Template can be assigned. For example, you can select Microsoft SQL Server to monitor Microsoft SQL Server databases.

   Click **Next**.

10. In the Aspects page, click 🔧, and then click 📖 **Add Existing Aspect** to add existing Aspects to the new Microsoft SQL Server Management Template. The Add Existing Aspect dialog box opens. Select the Aspects that you want to add, and then click **OK**.

    If suitable Aspects do not exist, click the 🔧, and then click 📖 **Add New Aspect** to create them from here.

11. For each Aspect that you add, you must specify at least one **Target CI**.

    Click an Aspect in the list, and then in the topology map click the CI types you want the Aspect to monitor when this Management Template is assigned. (Press **CTRL** to select several CI types.) Each CI type that you select here must correspond to one of the CI types assigned within the Aspect itself (or a child of one of those CITs). For example, you can select Microsoft SQL Server CI from the topology map.

12. In the **Parameters** tab, you see a list of all the parameters from the Aspects that you added to this Management Template.

To combine parameters:

a. Press **CTRL** and click the parameters that you want to combine.

b. Click ⬚ . The Edit/Combine Parameters dialog box opens.

c. Type a **Name** for the combined parameters.

d. *Optional.* Specify a **Description**, **Default Value**, and whether the combined parameter is **Read Only**, an **Expert Setting**, or **Hidden**.

You can specify either a specific default value, or you can click **From CI Attribute** and then browse for a CI attribute. When you specify a CI attribute, Operations Management sets the parameter value automatically during the deployment of the underlying policy templates, using the actual value of this attribute from the CI. You can also change values of conditional parameters. (The conditions are read-only and cannot be changed at Management Template level.)

Read Only prevents changes to the parameter value when the Management Template is assigned to a configuration item. Hidden also prevents changes, but additionally makes the parameter invisible when the Management Template is assigned, and during parameter tuning. Users can choose whether to show expert settings when they make an assignment.

e. Click **OK**.

You can also edit the parameters without combining them, to override the defaults in the Aspects or policy templates. Click one parameter, and then click ⬚. The Edit/Combine Parameters dialog box opens.

13. In the Create Management Template wizard, click **Finish** to save the Management Template and close the wizard. The new Management Template appears in the Management Templates & Aspects pane.

Editing Microsoft SQL Server Management Templates

You can edit the Microsoft SQL Server Management Templates and modify the following components:

- Parameters
- Microsoft SQL Server Aspects

Editing Parameters

Use Case: You are using Essential Microsoft SQL Server Management Template to monitor single instance databases in your environment. You are monitoring the table spaces with low free space in the environment and want to modify the parameters corresponding to tablespaces to closely monitor the free space available.

To closely monitor tablespaces in your environment, you must modify the tablespace parameters - tablespaces with low free space frequency, tablespaces with low free space threshold and tablespaces with low free space severity.

To edit the parameters, follow these steps:

1. Open the Management Templates & Aspects pane:

   On BSM, click **Admin > Operations Management > Monitoring > Management Templates & Aspects**.

   On OMi, click **Administration > Monitoring > Management Templates & Aspects**.

2. In the Configuration Folder pane:

   Configuration Folders > Database Management > Microsoft SQL Server > Microsoft SQL Server Management Templates > Essential Microsoft SQL Server Management Template

3. Select the **Essential Microsoft SQL Server Management Template** from the list, and then click
   . The Edit Management Template dialog box opens.

4. Click the **Parameters** tab. The list of parameters appear.

5. Double-click the **tablespace** parameter. The Edit/Combine Parameters window appears.

   In this instance, tablespace parameter is tablespaces with low free space frequency, tablespaces with low free space threshold or tablespaces with low free space severity.

6. You can change the default value by using the drop down text. For example, you can change the value of the parameter tablespace with low free space frequency to High from Medium.

7. Click **OK**. The Edit Management Template dialog box opens.

8. Click **OK**. The version of the Microsoft SQL Server Management Template is incremented.

Note: The version number of the Microsoft SQL Server Management Template is incremented when any customizations are made to the Microsoft SQL Server Management Template.

Editing Aspects

Use Case: You are using Extensive Microsoft SQL Server Management Template to monitor a high availability Microsoft SQL Server Real Application Cluster (RAC) environment operating with ASM solution. You do not want to use some Aspects which are part of the Extensive Microsoft SQL Server Management Template.

To edit the Aspects, follow these steps:

1. Open the Management Templates & Aspects pane:

   On BSM, click **Admin > Operations Management > Monitoring > Management Templates & Aspects**.

   On OMi, click **Administration > Monitoring > Management Templates & Aspects**.

2. In the Configuration Folder pane:

   Configuration Folders > Database Management > Microsoft SQLServer > Microsoft SQL Server Management Templates > Essential Microsoft SQL Server Management Template

3. Select the **Essential Microsoft SQL Server Management Template** from the list, and then click
   . The Edit Management Template dialog box opens.

4. Click the **Aspects** tab. The list of Aspects appear.

5. Select the Aspect that you want to delete from the list. For example, you want to delete the Microsoft SQL Server Latches Aspect.

6. Click   to delete the selected Aspect.

7. Click **OK**. The version of the Microsoft SQL Server Management Template is incremented.

User Defined Metrics (UDM)

You can collect additional data from Microsoft SQL Server databases by creating User Defined Metrics (UDMs). By default, the UDMs are part of User Defined Aspects (UDA). The User Defined Aspect includes the following policies:

- Microsoft SQLServerDB_37XX - Measurement Threshold policy for monitoring UDM

- Microsoft SQLServer SampleUDM - Sample Config file policy template to create a UDM

Tasks

How to Create UDM

To create user defined metrics, follow these steps:

1. Open the Management Templates & Aspects pane:

    On BSM, click **Admin > Operations Management > Monitoring > Management Templates & Aspects**.

    On OMi, click **Administration > Monitoring > Management Templates & Aspects**.

2. In the Configuration Folders pane:

    Configuration Folders > Database Management > Microsoft SQL Server > Microsoft SQL Server Aspects >Microsoft SQL Server UDA

3. In the Microsoft SQL Server UDA folder, select 1.0 and then click . The Edit Aspect dialog box opens.

4. Click the **Policy Templates** tab and select the Microsoft SQL Server Sample UDM policy template (Config File policy) and then click .

5. Click the **Policy Data** tab. It contains details about defining a user defined metric and a sample example of a user defined metric. You can edit the data and save the file. The version number of the Sample UDM policy is incremented by 1.

6. To define the parameters for the metric, you must create a copy of the measurement threshold template Microsoft SQLServerDB_37XX.

7. Open the Policy Templates pane:

    On BSM, click **Admin > Operation Management > Monitoring > Policy Templates**.

    On OMi, click **Administration > Monitoring > Policy Templates**.

8. In the Policy Templates groups pane:

    Templates grouped by Type > Measurement Threshold Templates > Microsoft SQL ServerDB_37XX

9. To copy Microsoft SQL ServerDB_37XX, right-click and select copy item and paste the item.

10. Rename the file as **Microsoft SQL ServerDB_0701**.

11. Select the policy template **Microsoft SQLServerDB_0701** and then click .

> You must edit the policy in raw mode.

12. In the **Policy Parameters** tab, you can select and edit the parameters. For example, to modify the UDM frequency, you can select the parameters UDM frequency and then click 🖊. The Edit Parameter window opens. You can modify the default values and then click **OK**. The version of the policy template **Microsoft SQLServerDB_0701** increments by 1.

How to Deploy UDM

You must deploy the policy templates - Microsoft SQLServerDB_0701 and Microsoft SQLServer Sample UDM for monitoring UDM.

1. Open the Policy Templates pane:

   On BSM, click **Admin > Operations Management > Monitoring > Policy Templates**.

   On OMi, click **Administration > Monitoring > Policy Templates**.

2. In the Policy Template Folder pane, expand the tree, click the policy template that you want to deploy, and then click 🌐. The Assign and Deploy wizard opens.

3. In the **Configuration Item** tab, click the CI to which you want to assign the policy template, and then click **Next**.

4. In the **Required Parameter** tab, specify a value for each parameter:

   a. Select a parameter in the list, and then click 🖊 .

      - For standard parameters, the Edit Parameter dialog box opens.

        Click **Value**, specify the value, and then click **OK**.

      - For instance parameters, the Edit Instance Parameter dialog box opens.

        Change the instance values if necessary, and then for each instance value, change dependent parameter values. After you change the instances and dependent parameter values, click **OK**.

   b. Click **Next**.

5. *Optional.* If you do not want to enable the assignment immediately, on BSM clear the **Enable Assigned Objects** check box and on OMi clear the **Enable Assignment(s)** check box. You can then enable the assignment later using the Assignments and Parameters manager.

6. Click **Finish**.

Appendix A: Permissions and Grants

Following is the list of grants and privileges for the Microsoft SQL Server user account for OMi MP for Microsoft SQL Server.

Database master:	Database msdb:
GRANT create table	GRANT select ON msdb.dbo.agent_datetime
GRANT select ON sys.objects	GRANT select ON msdb..sysjobs
GRANT select ON sys.sysperfinfo	GRANT select ON msdb..sysjobhistory
GRANT select ON sys.dm_os_performance_counters	GRANT select ON msdb..sysjobsteps
GRANT select ON sys.sysprocesses	GRANT select ON msdb..sysjobschedules
GRANT select ON sys.dm_exec_sessions	GRANT select ON msdb..sysjobs_view
GRANT select ON sys.dm_exec_requests	GRANT select ON msdb..MSdistributiondbs
GRANT select ON sys.dm_tran_locks	GRANT select ON msdb..log_shipping_monitor_primary
GRANT select ON sys.sysconfigures	GRANT select ON msdb..log_shipping_primary_databases
GRANT select ON sys.configurations	GRANT select ON msdb..log_shipping_monitor_error_detail
GRANT select ON sys.databases	GRANT select ON msdb..log_shipping_monitor_secondary
GRANT select ON sys.sysdatabases	GRANT select ON msdb..log_shipping_secondary
GRANT select ON sys.sysfiles	GRANT select ON msdb..sysjobservers
GRANT select ON sys.database_files	GRANT select ON msdb..sysjobactivity
GRANT select ON sys.sysindexes	GRANT execute ON msdb..sp_help_job
GRANT select ON sys.partitions	EXEC sp_dbmmonitorupdate
GRANT select ON sys.allocation_units	EXEC sp_addrolemember 'dbm_monitor', '<user>'
GRANT select ON sys.sysobjects	EXEC sp_addrolemember 'SQLAgentReaderRole', '<db mp user>'
GRANT select ON sys.sysdevices	
GRANT select ON sys.backup_devices	
GRANT execute ON sys.sp_monitor	
GRANT execute ON sys.xp_sqlagent_enum_jobs	
EXEC sp_configure 'show advanced	

Database master:	Database msdb:
option','1' GRANT VIEW SERVER STATE to '<user>'	

Perform on all databases:

GRANT select on executionlog

exec sp_addrolemember 'db_datareader', '<user>'

Grant the following to all databases listed in the msdb..MSdistributiondbs:

GRANT select ON `MSmerge_agents`

GRANT select ON `MSmerge_history`

GRANT select ON `MSmerge_sessions`

GRANT select ON `MSsnapshot_agents`

GRANT select ON `MSlogreader_agents`

GRANT select ON `MSdistribution_history`

GRANT select ON `MSsnapshot_history`

GRANT select ON `MSlogreader_history`

GRANT select ON `MSdistribution_agents`

Additionally, on all the databases, run the stored procedure `sp_grantdbaccess` by typing the following command:

```
EXEC sp_grantdbaccess '<user>','<passwd>'
```

Note: Microsoft SQL Server metric 3035 needs DBCC opentran privilege to run.

Appendix B: Data Sources for Logging

The metric data is logged into specific data sources for generating reports and graphs.

Generic Data Source

The generic data source reserves a column for the database instance name, labeled instance name. This column also contains the information that differentiates the data collected for each instance. Other column represents the graphing metrics. The complete list of all the graphing metrics is stored in the **dbspimssg.fm** file located at:

Windows: `<ovagentdir>\bin\instrumentation`

Format of Generic Data Source

The following table provides information about the format of generic data source.

INSTANCE NAME	M001_ CacheHitPct	M002_ CacheFreeBufPct	M003_LogLogicalIOAvg	...
`<value>`	`<value>`	`<value>`	`<value>`	`<value>`
`<value>`	`<value>`	`<value>`	`<value>`	`<value>`

Reports

The web based reports enable you to check the health and efficiency of specific Microsoft SQLServer databases. The reports are generated from the **DBSPI_MSS_REPORT** data source. For information about viewing and accessing reports, see the *Operations Bridge Reporter (OBR)* documentation.

The **DBSPI_MSS_REPORT** contains information about the following columns:

- Instance Name
- Metric ID

- Value ID

- System ID

- Object ID

01/09/14 05:25:03 PM	INSTANCENAME	onehp
01/09/14 05:25:03 PM	METRICID	201.00
01/09/14 05:25:03 PM	VALUEID	1.00
01/09/14 05:25:03 PM	VALUE	5.00
01/09/14 05:25:03 PM	SYSTEMID	Machine Name
01/09/14 05:25:03 PM	OBJECTID	onehp

Graph Templates

Graphs represent pictorial representation of metrics. The graphs are generated from the **DBSPI_MSS_ GRAPH** data source. For information about creating and viewing graphs, see the Performance Graphing section available in the *Operations Manager i* documentation. The OMi MP for Microsoft SQL Server includes the Microsoft SQL Server graph family, which is mapped to the SQL Server CIT.

The following table lists the graph templates present in the OMi MP for Microsoft SQL Server and SPI for Microsoft SQL Server graph family and the mapped policies.

Graph Templates	Metric Name	Policy Description
Data Access	MicrosoftSQLServer_ 3051	Full Scans Rate.
	MicrosoftSQLServer_ 3052	Index searches rate.
	MicrosoftSQLServer_ 3053	Pages allocated rate.
	MicrosoftSQLServer_ 3054	Extents allocated rate.
	MicrosoftSQLServer_ 3055	Page splits rates.
	MicrosoftSQLServer_	Table lock escalation rate.

Graph Templates	Metric Name	Policy Description
	3056	
Errors	MicrosoftSQLServer_ 3023	Number of SQL Server read/write errors since the last probing.
	MicrosoftSQLServer_ 3024	Number of packet errors while reading or writing packets.
	MicrosoftSQLServer_ 3028	Number of databases marked as suspect.
IO Utilization	MicrosoftSQLServer_ 3007	Number of read requests issued to OS that are not completed.
	MicrosoftSQLServer_ 3008	Number of write requests issued to the OS not completed.
Latches	MicrosoftSQLServer_ 3068	Number of latch requests that was not immediately granted and had to wait before being granted.
	MicrosoftSQLServer_ 3069	Average latch wait time for latch requests that had to wait from the time server started.
	MicrosoftSQLServer_ 3076	Average latch wait time for latch requests that had to wait during the current collection interval.
Locks and its Memory Utilization	MicrosoftSQLServer_ 3013	Percentage of locks in use.
	MicrosoftSQLServer_ 3075	Percentage of lock memory in use.
Lock Requests	MicrosoftSQLServer_ 3070	Lock timeout rate.
	MicrosoftSQLServer_ 3071	Deadlocks rate.
	MicrosoftSQLServer_ 3072	Locks wait rate.
	MicrosoftSQLServer_ 3073	Average lock wait time.
Least Recently Used	MicrosoftSQLServer_ 3001	Percentage of times a data page found in the cache.
Server Status	MicrosoftSQLServer_ 3017	Percentage of the command queue length used.
	MicrosoftSQLServer_	Percentage of the CPU time used by SQL server.

Graph Templates	Metric Name	Policy Description
	3025	
	MicrosoftSQLServer_3074	Batch requests rate.
Transactions	MicrosoftSQLServer_3009	Server transaction rate
	MicrosoftSQLServer_3066	Number of the log expansions for the server.
Server Status for processes and transactions	MicrosoftSQLServer_3014	Number of blocked processes.
	MicrosoftSQLServer_3064	Number of active transactions for the entire server.
Users	MicrosoftSQLServer_3011	Percentage of the current users connected.
	MicrosoftSQLServer_3026	Percentage of the total connections that are active and sleeping.

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