OMi Management Pack for IBM WebSphere Application Server

Software Version: 1.00

Operations Manager i for Linux and Windows® operating systems

User Guide

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Chapter 1: OMi Management Pack for IBM WebSphere Application Server

The OMi Management Pack for IBM WebSphere Application Server (OMi MP for IBM WebSphere Application Server) works with Operations Manager i (OMi) and enables you to monitor IBM WebSphere Application Servers and the underlying infrastructure running in your environment using the OMi console. It includes Health Indicators (HIs), Event Type Indicators (ETIs), and Correlation Rules that analyze the events that occur in the IBM WebSphere Application Servers and report the health status. It also provides out-of- the-box Management Templates and Aspects for monitoring the availability, health, and performance of IBM WebSphere Application Servers. The Management Templates consists of a wide range of Aspects which enable monitoring the cluster status, server status, EJB (Enterprise JavaBeans) performance, and so on.

The Management Templates or Aspects can be seamlessly deployed by administrators for monitoring the IBM WebSphere Application Servers in an enterprise environment. The Subject Matter Experts (SMEs) and developers can easily customize the WebSphere Management Templates.

The out-of-the-box Management Templates or Aspects can be used to monitor the following types of environments:

- Network Deployment
- Standalone
- Cluster
- Secure configurations - LDAP and SSL

OMi MP for IBM WebSphere Application Server supports the following:

- Automated instance based simplified configuration and deployment.
- Provides a 360 degree monitoring of the health and performance of IBM WebSphere Application Servers and its underlying infrastructure in all deployment scenarios.
- Ready to deploy out-of- the-box management solutions to suit different monitoring requirements.
- Monitoring of composite applications - IBM WebSphere Application Servers, Oracle databases, and the underlying system infrastructure.

Chapter 2: Getting Started

The following section provides step-by-step information about monitoring IBM WebSphere Application Servers from the BSM console.

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

> **Note:** If the WebSphere Application Servers that you want to monitor is already being monitored by Smart Plug-in for WebSphere Application Server (SPI for WebSphere Application Server), then remove the SPI artifacts and datasources from the managed node hosting the WebSphere Application Server before proceeding.

> **Note:** If the node already exists in RTSM, you can skip this step and proceed to Task 2.

Before you begin monitoring, you need to add the nodes, by following these steps:

1. Open the Monitored Nodes manager from Administration:

   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 Filter > Monitored Nodes** and then click  and then select **Computer > <select required OS type>**. 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**.

Task 2: Enabling the Enrichment Rules

You must enable the following enrichment rules to populate the WebSphere CI's display label with additional information about container or the hostname. The Enrichment Rules must be enabled to reconcile more than one j2eedomain CIs with the same name as a single CI entity:

- SoftwareElementDisplayLabelForNewHost
- SoftwareElementDisplayLabelForExistingHost
- SoftwareElementDisplayLabelPopulator

To enable the Enrichment Rules, follow these steps:

1. Open the Enrichment manager:

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

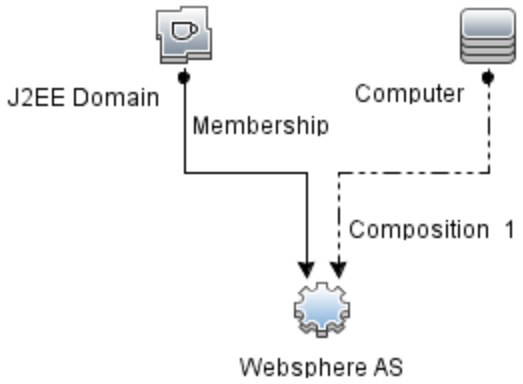
   On OMi 10.x, click **Administration > RTSM Administration > Modeling > Enrichment manager**.
2. In the Enrichment Rules pane, select **SoftwareElementDisplayLabelForNewHost** from the list.
3. Right-click and select **Properties**. The Enrichment Rule Properties window appears.
4. Click **Next**.
5. 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.
10. In the Enrichment Rules pane, click **Root > Operations Management > J2EE Application Servers**.
11. Select **WebSphereJ2EEDomainReconciliation** and repeat steps 3 to 7.

Task 3: Deploying the WebSphere Discovery Aspect

The WebSphere Discovery Aspect enables you to discover IBM WebSphere Application Server instances in the environment. To discover the IBM WebSphere Application Server CIs on the added managed nodes, you must deploy the WebSphere Discovery Aspect to a Computer CI.

The WebSphere Discovery Aspect deployment discovers the Configuration Item (CIs) of the following CI types (CITs):

- j2eedomain
- websphereas



To deploy the WebSphere Discovery Aspect, 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 > Application Server Management > IBM WebSphere Management > Aspects

3. In the Aspects folder, click **WebSphere Discovery** Aspect, and then click  to open the Assign and Deploy Wizard.

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

5. In the **Required Parameters** tab, click **Next**.

   > **Note:** A message appears 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, to change the default value of the Frequency of WebSphere_MPlog parameter, you can select the parameter and then click  . The Edit Parameter dialog box opens. Click **Value**, specify the

value, and then click **OK**.

7. Click **Next**.
8. *(Optional)*. In the **Configure Options** tab, if you do not want to enable the assignment immediately, perform the following:

   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.
9. Click **Finish**.

> **Note:** After the WebSphere Discovery Aspect is deployed, a message stating the `Assignment and deployment jobs created` appears. To check the status of the deployment job, 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 WebSphere Discovery Aspect, you can verify if the CIs are populated in the View Explorer.

1. Open the Event 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 the**WebSphere_Deployment_View** from the drop-down list. You can see the CIs associated with the **WebSphere_Deployment_View**.

Task 5: Deploying the WebSphere Management Templates or WebSphere Aspects

This section provides information about data collection, deploying the mangement templates and aspects. For more information about deploying WebSphere Management Templates, go to "Task 5a:

Identifying and Deploying WebSphere Management Templates". For more information about deploying WebSphere Aspects, go to "Task 5b: Deploying WebSphere Aspects".

Management Pack Data Collection Process

The 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 logging data.

Following are the four predefined frequency parameters:

Scheduler Frequency	Default value
Very High	5 mins
High	15 mins
Medium	1 hour
Low	24 hours

After Management Templates and Aspects are deployed, collector is triggered based on the parameter value 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.

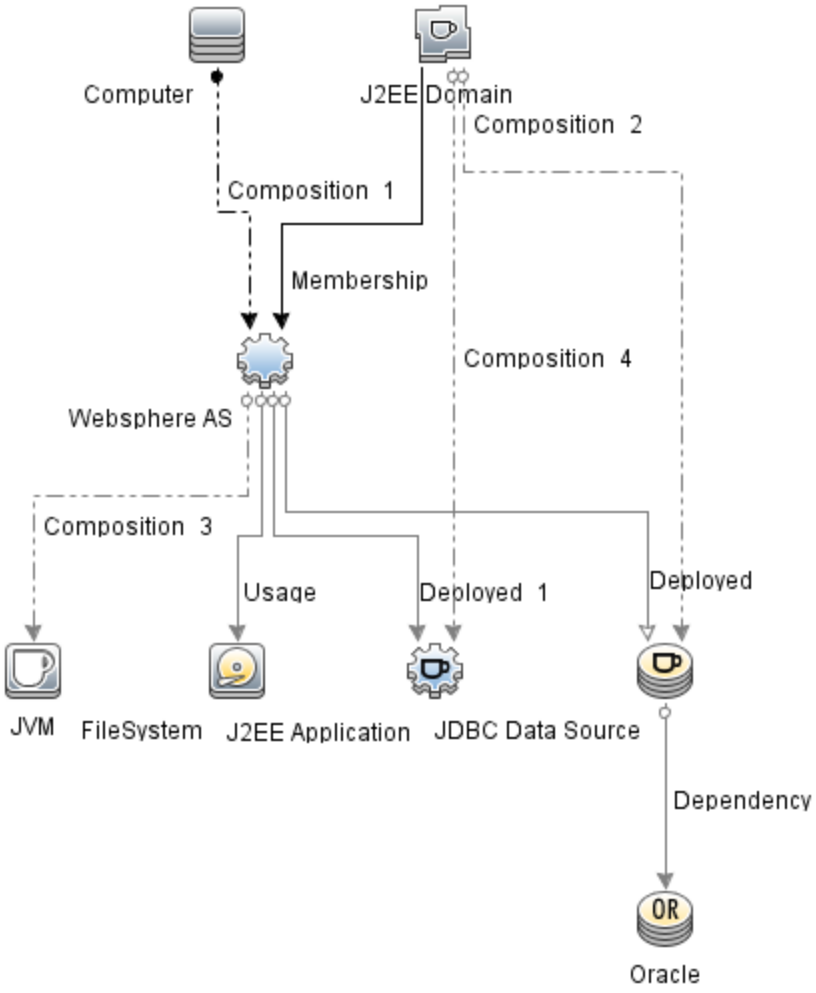
For more information about how to modify the parameter values, see the section *Editing Parameters*.

Task 5a: Identifying and Deploying WebSphere Management Templates

Before deploying the WebSphere Management Templates, you must deploy the WebSphere Discovery Aspect. For more information, see "Task 3: Deploying the WebSphere Discovery Aspect".

The WebSphere Management Template discovers the CIs of the following CITs and completes the topology as shown in the following figure:

- JVM
- J2EE Application
- JDBC Data Source



You can identify the WebSphere Management Template suitable for your environment by following these recommendations:

- If you want to monitor the primary areas of IBM WebSphere Application Server such as server status, JVM, JDBC, EJB and Servlets, and server logs, you can deploy the Essential WebSphere Management Template.

- If you want to monitor the primary and advanced areas of IBM WebSphere Application Server such as transactions, cluster status cache usage, and threads, you can deploy the Extensive WebSphere Management Template.
- If you want to monitor composite applications comprising IBM WebSphere Application Servers, Oracle databases, and the underlying infrastructure, you can deploy the Extensive WebSphere and Oracle Database Management Template.

To deploy the WebSphere Management Templates to the WebSphere cell CIs (j2eedomain), 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 > Application Server Management > IBM WebSphere Management > Management Templates

3. In the 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 j2ee Domain CI to which you want to assign the Management Template, and then click **Next**. You can select multiple items by holding down the **CTRL** or **SHIFT** key while selecting them. Click **Next** to accept the CIs and go to **Required Parameters**.

5. In the **Required Parameters** tab, you must specify the values of all the parameters that are listed (Username and Password). To specify the values of the parameters, you can select the parameter and then click  . The Edit Parameter dialog box opens. Click **Value**, specify the value, and then click **OK**.

   > **Note:** You must specify values for all the parameters to be able to continue the configuration process.

   > **Note:** The credentials given during the deployment of a Management Template should have required privileges. For more information see the section User Privileges in the *OMi MP for IBM WebSphere Application Server Installation Guide*.

6. Click **Next**.

7. In the **All Parameters** tab on BSM 9.2x or **Parameter Summary** tab on OMi 10.x, you can override the default value of any parameters. You can specify a value for each parameter at the Management Template level. By default, parameters defined as expert parameters are not shown. To view expert parameters, click **Show Expert Parameters**.

   > **Note:** If the protocol configured for data collection is JSR160RMI, the values for the parameters (WebSphere Application Server JMX Connector Type and WebSphere Application Server Port Number) must be specified.

8. Click **Next**.
9. *(Optional)*. If you do not want to enable the assignment immediately, perform the following:

   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.

10. Click **Finish**.

Task 5b: Deploying WebSphere Aspects

Before deploying the WebSphere Aspects, you must deploy the WebSphere Base Aspect to discover the CIs of the following CITs:

- JVM
- J2EE Application
- JDBC Data Source

To deploy the WebSphere Base Aspect, 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 > Application Server Management > IBM WebSphere Management > Aspects > WebSphere Base**

3. In the Aspects folder, click the **WebSphere Base**, and then click  . The Assign and Deploy wizard opens.
4. In the **Configuration Item** tab, Select the WebSphere CI and then click **Next**. You can select multiple items by holding down the **CTRL** or **SHIFT** key while selecting them. Click **Next** to accept the CIs and go to **Required Parameters**.

   > **Note:** If you want to deploy Aspects to Node CIs, select **Also show CIs of type Node**.

5. In the **Required Parameters** tab, you must specify the values of all the parameters that are listed (Username and Password). To specify the values of the parameters, you can select the parameter and then click  . The Edit Parameter dialog box opens. Click **Value**, specify the value, and then click **OK**.

   > **Note:** You must specify values for all the parameters to be able to continue the configuration process.

   > **Note:** The credentials given during the deployment of a Management Template should have required privileges for OMi MP for IBM WebSphere Application Server to collect performance management data.

6. Click **Next**.
7. In the **All Parameters** tab on BSM 9.2x or **Parameter Summary** tab on OMi 10.x, you can override the default value 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**.

   > **Note:** If the protocol configured for data collection is JSR160RMI, the values for the parameters (WebSphere Application Server JMX Connector Type and WebSphere Application Server Port Number) must be specified.

8. Click **Next**
9. *(Optional)*. If you do not want to enable the assignment immediately,perform the following:

   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.

10. Click **Finish**.

To deploy the remaining WebSphere Aspects, 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 > Application Server Management > IBM WebSphere Management > Aspects

3. In the Aspects folder, click the WebSphere Aspect 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 WebSphere Aspect, and then click **Next**. You can select multiple items by holding down the **CTRL** or **SHIFT** key while selecting them. Click **Next** to accept the CIs and go to **Required Parameters**.

   > **Note:** If you want to deploy Aspects to Node CIs, select **Also Show CIs of type Node**.

5. In the **Required Parameters** tab, you must specify the values of all the parameters that are listed (Username and Password). To specify the values of the parameters, you can select the parameter and then click  . The Edit Parameter dialog box opens. Click **Value**, specify the value, and then click **OK**.

   > **Note:** You must specify values for all the parameters to be able to continue the configuration process.

   > **Note:** The credentials given during the deployment of WebSphere Aspects should have required privileges. For more information see the section User Privileges in the *OMi MP for IBM WebSphere Application Server Installation Guide*.

6. Click **Next**.

   > **Note:** If the protocol configured for data collection is JSR160RMI, the values for the parameters (WebSphere Application Server JMX Connector Type and WebSphere Application Server Port Number) must be specified.

7. In the **All Parameters** tab on BSM 9.2x or **Parameter Summary** tab on OMi 10.x, you can override the default value 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 view the expert parameters, click **Show Expert Parameters**.

> **Note:** If the protocol configured for data collection is JSR160RMI, the values for the parameters (WebSphere Application Server JMX Connector Type and WebSphere Application Server Port Number) must be specified.

8. Click **Next**.
9. *(Optional)*. If you do not want to enable the assignment immediately, clear the **Enable Assigned Objects** check box. You can then enable the assignment later using the Assignments &Tuning pane.
10. Click **Finish**.

Task 6: Verifying Discovery for Extended Topology

After you deploy the WebSphere Management Templates or WebSphere Base Aspect, you can verify if the CIs are populated in the View Explorer.

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

1. In the BSM Console, click **Applications > Operations Management > Event Perspective**.
2. In the View Explorer, select **WebSphere_Deployment_View** from the drop-down list. You can see the extended topology comprising CIs associated with the **WebSphere_Deployment_View** as shown in the following figure.

Checking the Topology Synchronization Settings

> **Note:** It is recommended to check the Topology Synchronization settings if a node or a Configuration Item (CI) is monitored by Operations Manager.

1. Open the **Infrastructure Settings** from the Operations Management 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 manager, select **Applications > Operations Management**.

3. In the Operations Management - HPOM Topology Synchronization Settings, Packages for Topology Sync contains the packages that are used for topology synchronization. In addition to other packages, make sure that you have the **default;nodegroups;operations-agent;HPOprSys;HPOprJEE** packages.

Monitoring IBM WebSphere Environment

After you deploy Management Template and Aspects, you can from the following perspectives:

- Event Perspective
- Health Perspective
- Performance Perspective

Event Perspective

After you deploy the WebSphere Discovery Aspect and WebSphere Management Template(s), you can view the events of the WebSphere Application Server CIs that are monitored by OMi MP for IBM WebSphere Application Server.

To view the Event Perspective of the IBM WebSphere Application Server CIs, follow these steps:

1. Open the Event Perspective pane:

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

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

2. From the drop-down menu, select **WebSphere_Deployment_View**.

   A list of WebSphere Application Servers monitored by OMi MP for IBM WebSphere Application Server appears.

3. Select the WebSphere Application Server CI for which you want to view the Event Perspective. The Event Browser pane displays events from the selected WebSphere Application Server CI.

   When you click an event from the Event Browser, the Event Details pane opens where you can view following details:

   - **General** - Displays the detailed information about the selected event such as Severity, Lifecycle State, Priority, Related CI, and so on.
   - **Additional Info** - Displays more detailed information about the attributes of the selected event.

- **Source Info** - Displays an overview of the information available about the source of the selected event.
- **Actions** - Displays the list of actions available for a selected event. There are two types of possible actions: User Action and Automatic Action.
- **Annotations** - Displays a list of the annotations attached to the selected event.
- **Custom Attributes** - Displays a list of the attributes that either an administrator or a responsible user manually configured and added to the selected event.
- **Related Events** - Displays an overview of all the events that are related to the event selected in the Event Browser.
- **History** - Displays the history of the selected event.
- **Resolver Hints** - Displays the information used to identify the node and CI associated with an event.
- **Instructions** - Displays instruction information designed to help operators handle the associated event.
- **Forwarding** - Displays the transfer of ownership details if any, for the events.

Health Perspective

After you deploy the WebSphere Discovery Aspect and WebSphere Management Template(s), you can view the events related to the health of the WebSphere Application Server CIs that are monitored by OMi MP for IBM WebSphere Application Server.

To view the Health Perspective of the IBM WebSphere Application Server CIs, follow these steps:

1. Open the Health Perspective pane:

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

   On OMi 10.x, click **Workspaces > Operations Console > Health Perspective**.
2. In the View Explorer, select **Browse Views** tab.
3. From the drop-down menu, select the **WebSphere_Deployment_View**.

   A list of WebSphere Application Servers monitored by OMi MP for IBM WebSphere Application Server appears.
4. Select the WebSphere Application Server CI for which you want to view the Health Perspective. The Event browser pane displays health related events from the selected WebSphere Application Server CI.

   When you click an event from the Event Browser pane, the following panes appear:

- **Health Top View** - Displays the health top view of the selected event.
- **Health Indicators** - Displays the Key Performance Indicators (KPIs) and HIs related to the CI that you select from the Health Top View pane.
- **Actions** - Displays the list of actions available for a selected event.

Performance Perspective

Performance Perspective enables you to populate graphs from existing graph templates. You can also plot customized graphs by selecting the required metrics for a selected CI.

To view the Performance Perspective of IBM WebSphere Application Server CIs using graphs, follow these steps:

1. Open the Performance Perspective pane:

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

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

   The View Explorer pane appears.

2. In the **Browse Views tab**, select **WebSphere_Deployment_View**. The performance pane appears, which lists the default graphs available for the **WebSphere_Deployment_View**.
3. Click the CI that you want to plot from the **Graphs** tab, and then click **Draw Graphs**. The selected graph is plotted on the right pane.

> **Note:** For more information about Managing Events, see the *Operations Manager i Concepts Guide*.

Chapter 3: Components

The OMi MP for IBM WebSphere Application Server includes the following components for monitoring IBM WebSphere Application Servers in your environment:

- WebSphere Management Templates
- WebSphere Aspects
- Parameters
- Configuration Items (CIs) and Configuration Item Types (CITs)
- Run-time Service Model (RTSM) Views
- Event Type Indicators (ETIs)
- Health Indicators (HIs)
- Topology Based Event Correlation (TBEC) Rules
- HI Assignments
- Key Performance Indicators (KPIs) Assignments
- Tools
- Operations Orchestration (OO) Flows
- Graph Templates

WebSphere Management Templates

The WebSphere Management Templates provide a complete management solution for monitoring the health and performance of IBM Application servers in your environment.

By default, OMi MP for IBM WebSphere Application Server comprises of four Management Templates with predefined set of Aspects. You can deploy the out-of-the-box Management Templates or can customize the Management Templates based on your monitoring requirements. You can also create Management Templates using the WebSphere Aspects to monitor the IBM WebSphere Application servers in your environment.

How to Access Management Templates

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. Click **Configuration Folders > Application Server Management > IBM WebSphere Management > Management Templates.**

Overview

OMi MP for WebSphere comprises the following WebSphere Management Templates:

- Essential WebSphere Management Template
- Extensive WebSphere Management Template
- Extensive WebSphere and Oracle Database Management Template

Tasks

How to Deploy WebSphere Management Templates

For information about deploying Management Templates, see Task 5: Deploying the WebSphere Management Templates or WebSphere Aspects .

How to Automatically Assign WebSphere Management Templates and WebSphere Aspects

To automatically assign WebSphere Management Templates or WebSphere Aspects, follow these steps:

1. Open Automatic Assignment Rules:

   On BSM 9.2x, click **Admin > Operations Management > Monitoring > Automatic Assignment Rules.**

   On OMi 10.x, click **Administration > Monitoring > Automatic Assignment Rules.**

   Automatic Assignment Rules consists of Automatic Assignment Rules pane at the top and Parameters pane at the bottom.

2. In the Automatic Assignment Rules pane, click  and select the appropriate option. The Create Auto-Assignment Rule wizard opens.

3. In the **Select Target View** tab, select the view for which you want to create the automatic assignment rule, and then click **Next**.
4. In the **Select Item to Assign** tab, click the Management Template or Aspect that you want to automatically assign to all the CIs, and then click **Next**.

   The latest version of the Management Template or Aspect that you want to assign is selected by default.
5. In the **Required Parameters** tab, type the user name and password details and click **OK**.
6. *(Optional)*. In the **All Parameters** tab on BSM 9.2x or **Parameter Summary** tab on OMi 10.x, you can change the default value of parameters by following these steps:

   a. Double-click the parameter you want to edit or select the parameter from the list and click  **Edit**. The Edit Parameter window opens.

   b. Modify the value and click **OK**.
7. Click **Next**.
8. *(Optional)*. In the **Configure Option** tab, clear the **Activate Automatic Assignment Rule** check box if you do not want to activate the assignment rule immediately. You can activate automatic assignment rules later using the Automatic Assignment Rules window at **Administration > Monitoring > Automatic Assignment Rules** on OMi 10.x and **Admin > Operations Management > Monitoring > Automatic Assignment Rules** on BSM 9.2x.
9. Click **Finish** to save the changes. The assignment rule is added to the list of automatic 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 by following these steps:

   a. Open the Assignments & Tuning pane:

      On BSM 9.2x, click **Admin > Operations Management > Monitoring > Assignments & Tuning**.

      On OMi 10.x, click **Administration > Monitoring > Assignments & Tuning**.

b. In the **Browse Views** tab, select the view you identified while creating your automatic assignment rule.

c. 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 pane to tune the parameter values for all assignments triggered by the automatic assignment rule.
- Use the Assignments & Tuning pane to tune, redeploy, delete, and enable or disable individual assignments.

How to Deploy an Assignment Report for a WebSphere Management Template

1. Select the Management Template you want to create the report.
2. Click  **Generate Assignment Report** in the Management Templates & Aspects pane. The pre-configured *Assignment Report* is displayed.

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

Essential WebSphere Management Template

The Essential WebSphere Management Template manages IBM WebSphere Application Server environments and enables you to monitor the primary areas of IBM WebSphere Application Server such as JVM, JDBC, EJB, and servlets. In addition, you can also monitor the critical infrastructure areas in the IBM WebSphere Application Server such as CPU, memory, and disk.

How to Access Essential WebSphere Management Template

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. Click **Configuration Folders > Application Server Management > IBM WebSphere Management > Management Templates > Essential WebSphere Management Template**.

User Interface Reference

Management Template - General

Provides an overview of the attributes of the Management Template.

UI Element	Description
Name	Essential WebSphere Management Template.
Description	The description of the Management Template.
ID	A unique identifier for GUI 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	The text that describes what is new or modified in this version of the Management Template.

Management Template - Topology View

Provides an overview of the CI type you want to assign to the Management Template.

UI Element	Description
Topology View	**WebSphere_Deployment_View** is the topology view for Essential WebSphere Management Template. It contains the CI types that you want to manage using the Management Template.
CI Type	The type of CIs managed by Essential WebSphere Management Template. This is the type of CI to which the Management Template can be assigned. The Essential WebSphere Management Template contains WebSphere Application Server CI types.

Management Template - Aspects

The Essential WebSphere Management Template consists of the following WebSphere Aspects to monitor IBM WebSphere Application Servers:

- WebSphere Base
- WebSphere EJB Performance
- WebSphere JDBC Connection Pool Status
- WebSphere JVM Heap Memory

- WebSphere Server Status
- WebSphere Servlet Performance

List of Infrastructure MP Aspects

The Essential WebSphere Management Template consists of the following Infrastructure Aspects to monitor Infrastructure elements:

Resource Bottleneck Diagnosis

The Resource Bottleneck Diagnosis Aspect identifies congestion 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). Memory bottleneck monitoring is based on memory utilization, free memory available, and memory swap out rate. File system monitoring is based on space utilization level for busiest file system on the node. Network monitoring is based on Packet collision rate, packet error rate, and outbound queue length.

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.

System Infrastructure Discovery

The System Infrastructure Discovery Aspect discovers and gathers information regarding the system resources, operating system, and applications on a managed node.

Extensive WebSphere Management Template

The Extensive WebSphere Management Template manages IBM WebSphere Application Server environments and enables you to monitor the primary and advanced areas of IBM WebSphere Application Servers such as transactions, cluster status, cache usage, threads, and server logs. In

addition, you can also monitor the infrastructure areas of IBM WebSphere Application Servers such as CPU, memory, and disk.

How to Access Extensive WebSphere Management Template

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. Click **Configuration Folders > Application Server Management > IBM WebSphere Management > Management Templates > Extensive WebSphere Management Template.**

User Interface Reference

Management Template - General

Provides an overview of the attributes of the Management Template.

UI Element	Description
Name	Extensive WebSphere Management Template.
Description	The description of the Management Template.
ID	A unique identifier for GUI 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	The text that describes what is new or modified in this version of the Management Template.

Management Template - Topology View

Provides an overview of the CI type you want to assign to the Management Template.

UI Element	Description
Topology View	**WebSphere_Deployment_View** is the topology view for Extensive WebSphere Management Template. It contains the CI types that you want to manage using the Management Template.

UI Element	Description
CI Type	The type of CIs managed by Extensive WebSphere Management Template. This is the type of CI to which the Management Template can be assigned. The Extensive WebSphere Management Template contains WebSphere Application Server CI types.

Management Template - Aspects

The Extensive WebSphere Management Template consists of the following WebSphere Aspects to monitor IBM WebSphere Application Servers:

WebSphere Base

WebSphere Cluster Status

WebSphere EJB Performance

WebSphere JDBC Connection Pool Status

WebSphere JVM Heap Memory

WebSphere Server Status

WebSphere Servlet Performance

WebSphere Thread Status

WebSphere Transaction Status

List of Infrastructure MP Aspects

The Extensive WebSphere Management Template consists of the following Infrastructure Aspects to monitor Infrastructure elements:

Bandwidth Utilization and Network IOPS

The Bandwidth Utilization and Network IOPS Aspect 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

The CPU Performance Aspect monitors the overall CPU performance like the CPU utilization percentage and spike in CPU usage. Individual CPU performance monitoring is based on total CPU utilization, CPU utilization in user mode, CPU utilization in system mode and interrupt rate.

Memory and Swap Utilization

The Memory and Swap Utilization Aspect 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

The Remote Disk Space Utilization Aspect monitors space utilization of remote disk.

Resource Bottleneck Diagnosis

The Resource Bottleneck Diagnosis Aspect identifies congestion 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). Memory bottleneck monitoring is based on memory utilization, free memory available, and memory swap out rate. File system monitoring is based on space utilization level for busiest file system on the node. Network monitoring is based on packet collision rate, packet error rate, and outbound queue length.

Space Availability and Disk IOPS

The Space Availability and Disk IOPS Aspect monitors the disk I/O operations and space utilization of the system.

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.

System Infrastructure Discovery

The System Infrastructure Discovery Aspect discovers and gathers information regarding the system resources, operating system, and applications on a managed node.

Extensive WebSphere and Oracle Database Management Template

The Extensive WebSphere and Oracle Database Management Template monitors components of your WebSphere server along with basic components of Infrastructure and Oracle database. The Extensive WebSphere and Oracle Database Management Template manages the IBM WebSphere Application Server environments in monitoring the primary and advanced areas of server such as transactions, cluster status, cache usage, threads, and server logs along with Oracle database single instance environment in monitoring the primary areas of database such as availability, query performance, tablespace, and Oracle alert log with critical infrastructure areas of CPU, memory, and disk.

> **Note:** The Extensive WebSphere and Oracle Database Management Template can be deployed only when the deployment of Discovery Aspect and deployment of Management Template or Aspect discovers the JDBC and its dependent Oracle CIs.

How to Access Extensive WebSphere and Oracle Database Management Template

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. Click **Configuration Folders > Application Server Management > IBM WebSphere Management > Management Templates > Extensive WebSphere and Oracle Database Management Template.**

User Interface Reference

Management Template - General

Provides an overview of the attributes of the Management Template.

UI Element	Description
Name	Extensive WebSphere and Oracle Database Management Template
Description	The description of the Management Template.
ID	A unique identifier for GUI 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	The text that describes what is new or modified in this version of the Management Template.

Management Template - Topology View

Provides an overview of the CI type you want to assign to the Management Template.

UI Element	Description
Topology View	**WebSphere_Deployment_View** is the topology view for Extensive WebSphere and Oracle Database Management Template. It contains the CI types that you want to manage using the Management Template.
CI Type	The type of CIs managed by Extensive WebSphere and Oracle Database Management Template. This is the type of CI to which the Management Template can be assigned. The Extensive WebSphere and Database Management Template contains WebSphere Application Server CI types.

Management Template - Aspects

The Extensive WebSphere and Oracle Database Management Template consists of the following WebSphere Aspects to monitor IBM WebSphere Application Servers:

WebSphere Base

WebSphere Cluster Status

WebSphere EJB Performance

WebSphere JDBC Connection Pool Status

WebSphere JVM Heap Memory

WebSphere Server Status

WebSphere Servlet Performance

WebSphere Thread Status

WebSphere Transaction Status

List of Infrastructure MP Aspects

The Extensive WebSphere and Oracle Database Management Template consists of the following Infrastructure Aspects to monitor Infrastructure elements:

Bandwidth Utilization and Network IOPS

The Bandwidth Utilization and Network IOPS Aspect monitors IO 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

The CPU Performance Aspect monitors the overall CPU performance like the CPU utilization percentage and spike in CPU usage. Individual CPU performance monitoring is based on total CPU utilization, CPU utilization in user mode, CPU utilization in system mode and interrupt rate.

Memory and Swap Utilization

The Memory and Swap Utilization Aspect 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

The Remote Disk Space Utilization Aspect monitors space utilization of remote disk.

Resource Bottleneck Diagnosis

The Resource Bottleneck Diagnosis Aspect identifies congestion 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). Memory bottleneck monitoring is based on memory utilization, free memory available, and memory swap out rate. File system monitoring is based on space utilization level for busiest file system on the node. Network monitoring is based on Packet collision rate, packet error rate, and outbound queue length.

Space Availability and Disk IOPS

The Space Availability and Disk IOPS Aspect monitors the disk IO operations and space utilization of the system.

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.

System Infrastructure Discovery

The System Infrastructure Discovery Aspect discovers and gathers information regarding the system resources, operating system, and applications on a managed node.

List of Oracle MP Aspects

The Extensive WebSphere and Database Management Template consists of the following Oracle Aspects to monitor Oracle components:

Basic Oracle Locks and Latches

The Basic Oracle Locks and Latches Aspect monitors the consumption of Oracle locks (in percentage) and also checks the usage of the counters - session wait lock count and latch count. This is a basic type of Aspect.

Basic Oracle Memory Performance

The Basic Oracle Memory Performance Aspect monitors the Oracle memory units - BufferCache, Shared Pool, and Library Cache. This is a Basic type of Aspect.

Basic Oracle Query Performance

The Basic Oracle Query Performance Aspect monitors the performance of Oracle queries by checking the Oracle metrics - Elapsed time and CPU time. This is a basic type of Aspect.

Basic Oracle Segment Space

The Basic Oracle Segment Space Aspect monitors the units of database storage - segments and extents. This is a basic type of Aspect.

Oracle Archive Health

The Oracle Archive Health Aspect monitors the Oracle device space, archive frequency rate, and redo logs that are not archived.

Oracle Database Availability

The Oracle Database Availability Aspect monitors the Oracle database connection status, processes, and logons.

Oracle Discovery

This Oracle Discovery Aspect discovers the Oracle, RAC, and ASM instances.

Oracle IO Performance

The Oracle IO Performance Aspect monitors the physical and logical read rate of Oracle instances.

Oracle Tablespace Health

The Oracle Tablespace Health Aspect monitors the Oracle table space status, free space, datafile status, and segments.

Oracle Transactions

The Oracle Transactions Aspect monitors the Oracle transactions percentage, commit rate, and open cursor. This is an advanced version of Basic Oracle Transactions Aspect.

WebSphere Aspects

WebSphere Aspects are used to monitor the basic and advanced components of the WebSphere Application Servers in your environment.

Tasks

How to Access WebSphere Aspects

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. Click **Configuration Folders > Application Server Management > IBM WebSphere Management > Aspects**.

How to Deploy WebSphere Aspects

For more information about deploying WebSphere Aspects, see Task 5: Deploying the WebSphere

Management Templates or WebSphere Aspects.

How to Create WebSphere Aspects

To create WebSphere Aspects, 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 Management Template & Aspects pane, click  , and then select **Create Aspect**. The Add New Aspect window opens.
3. In the **General** tab, specify a **Name**, **ID**, **Version ID**, and **Description** for the Aspect. Click **Next**.
4. In the **CI Type** tab, select one or more CI Types (CITs) from the Available CI Types pane to associate with the Aspect and click to add them to the Assigned CI Types pane, and then click **Next**.

   > **Note**: You can use either use the **CTRL** or **SHIFT** key to select multiple items.

5. In the **Instrumentation** tab, click  **Add Instrumentation** to select the instrumentation category that needs to be added to an Aspect. Click **Next**.
6. In the **Aspects** tab, click  **Add Existing Aspect** to add Aspects as nested aspects. The Add Existing Aspect dialog box opens and lists the Aspects. Select one or more Aspects by using either the **CTRL** or **SHIFT** key. Click **OK** and then click **Next**.
7. In the **Policy Templates** tab, click  **Add Policy Templates** on BSM 9.2x or **Add Policy Templates from List** on OMi 10.x to select the policy templates that has to be added to an Aspect. The Add New Policy Template to Aspect dialog box opens and lists the Policy Templates. Select one or more Policy Templates by selecting either the **CTRL** or **SHIFT** key. Click **OK** and then click **Next**.
8. If no suitable Policy Templates exist:

   a. Click  and then select **Add New Policy Template**. The Select New Policy Template dialog box opens.

   b. Select the **Measurement Threshold** policy template from the **Type** drop-down list. Click **OK**.

   c. In the Policy Related Information window, specify the **Name** and click **OK**. The Policy Template is added to the list of existing Policy Templates.

9. Click **Next**.
10. In the **Parameters** tab, you see a list of parameters from the Policy Templates that you assigned to a template.
    a. Click  **Edit**. The Edit Parameter dialog box opens.
    b. Modify the required details and click **OK**.
11. In the Add New Aspect window, click **Finish** to save the Aspect. The new Aspect appears in the Management Templates & Aspects pane.

User Interface Reference

General	Provides an overview of the general attributes of the WebSphere Aspects.
CI Type	The type of configuration items that the Aspect can be assigned to. This is the type of CI to which the Aspect can be assigned. The WebSphere Aspects contain the Computer, Node, Cluster, and CI types.
Instrumentation	Provides a single package which contains the binaries for discovery, collection, and data logging.
Aspects	Provides an overview of any Aspects that the WebSphere Aspect contains. The WebSphere Base Aspect is part of all the other Aspects.
Policy Templates	Provides an overview of the policy templates that the WebSphere Aspect contain. You can expand each item in the list to see more details about the policy template.

List of WebSphere Aspects

The OMi MP for IBM WebSphere Application Server comprises of the following WebSphere Aspects:

WebSphere Base

The WebSphere Base Aspect is the basic Aspect for monitoring the IBM WebSphere Application Servers and it contains the config file, open message interface, scheduled task, and logfile policy templates.

CI Type	Policy Template	Indicator	Description	Policy Type
j2eeserver	WebSphere_ Medium	N/A	Runs the WebSphere collector or analyzer as per the medium schedule.	Scheduled Task
j2eeserver	WebSphere_ High	N/A	Runs the WebSphere collector or analyzes per the high schedule.	Scheduled Task
j2eeserver	WebSphere_ TextLogs	N/A	This policy template monitors the specifics of IBM WebSphere Application Servers such as SystemOut, SystemErr, and messages using JMX notifications.	LogFile Entry
j2eeserver	WebSphere_ Messages	N/A	WebSphere Message Interceptor	Open Message Interface
j2eeserver	WebSphere_ Configuration	N/A	WebSphere_Configuration	ConfigFile
j2eeserver	WebSphere_ VeryHigh	N/A	Runs the WebSphere collector or analyzer as per the very high schedule.	Scheduled Task
j2eeserver	WebSphere_ ActivityLog_ JMXNotification	N/A	This policy template monitors the messages of IBM WebSphere Applications WebSphere Application servers using JMX notifications.	LogFile Entry
j2eeserver	WebSphere_ MPLog	N/A	This policy template monitors the WebSphere Perl, Discovery, and Collector Log files.	LogFile Entry

WebSphere Cluster Status

The WebSphere Cluster Status Aspect monitors the IBM WebSphere Application Server running in a cluster environment.

CI Type	Policy Template	Indicator	Description	Policy Type
j2eeserver	WebSphere_ ClusterStatus	ClusterStatus:Stopped / ClusterStatus:Started, ClusterStatus:PartialStop / ClusterStatus:Started	This policy template monitors the status of the cluster.	Measurement Threshold

WebSphere Discovery

The WebSphere Discovery Aspect discovers the IBM WebSphere Application Server instances.

CI Type	Policy Template	Indicator	Description	Policy Type
host_node	WebSphere_Messages	N/A	WebSphere Message Interceptor	Open Message Interface
host_node	WebSphere_Discovery	N/A	This policy template discovers the WebSphere Server domains, clusters, and, application servers. In addition, it also discovers the deployed applications and JDBC datasources.	Service Auto-Discovery
host_node	WebSphere_MPLog	N/A	This policy template monitors the WebSphere Perl, discovery, and collector log files.	LogFile Entry

WebSphere EJB Performance

The WebSphere EJB Performance Aspect monitors the IBM WebSphere Application Servers and checks the status of EJB transactions and pools.

CI Type	Policy Template	Indicator	Description	Policy Type
j2eeserver	WebSphere_EJBMethCallsRt	N/A	This policy template monitors the number of EJB method calls per minute.	ConfigFile
j2eeserver	WebSphere_EJBPoolMissPctApp	N/A	This policy template monitors the average percentage of time a call to retrieve an EJB from the pool failed for each application.	ConfigFile
j2eeserver	WebSphere_EJBEntDatLdStRt	N/A	This policy template monitors the number of times an EJB is	ConfigFile

CI Type	Policy Template	Indicator	Description	Policy Type
			written to or loaded from the database per minute.	
j2eeserver	WebSphere_EJBMsgBackoutRate	N/A	This policy template monitors the rate at which the messages failed to be delivered to the `MessageDrivenBeans onMessage` method.	Measurement Threshold
j2eeserver	WebSphere_EJBConcLivesApp	EJBConcurrentLives:High / EJBConcurrentLives:Normal	This policy template monitors the average number of EJB Concurrent Lives for an application.	Measurement Threshold
j2eeserver	WebSphere_EJBMethRespTime	EJBPerformance:Low / EJBPerformance:Normal, EJBPerformance:Low / EJBPerformance:Normal	This policy template monitors the average EJB response time in milliseconds.	Measurement Threshold
j2eeserver	WebSphere_EJBPoolMissPct	N/A	This policy template monitors the average percentage of time a call to retrieve an EJB from the pool failed.	ConfigFile
j2eeserver	WebSphere_EJBEntDatLdStRtApp	N/A	This policy template monitors the number of times an EJB was written to or loaded from the database per minute for an application.	Measurement Threshold
j2eeserver	WebSphere_EJBPoolUtil	N/A	This policy template monitors the percentage of active beans in the pool.	ConfigFile
j2eeserver	WebSphere_EJBPoolSize	N/A	This policy template monitors the	ConfigFile

CI Type	Policy Template	Indicator	Description	Policy Type
			average size of the EJB pool.	
j2eeserver	WebSphere_EJBMethCallsRtApp	N/A	This policy template monitors the number of EJB method calls per minute for an application.	Measurement Threshold
j2eeserver	WebSphere_EJBConcLives	N/A	This policy template monitors the average number of EJB objects in the pool.	ConfigFile
j2eeserver	WebSphere_EJBPoolUtilApp	EJBUtilization:High / EJBUtilization:Normal	This policy template monitors the percentage of active beans in the pool for an application.	Measurement Threshold
j2eeserver	WebSphere_EJBReturnDiscrdRt	N/A	This policy template monitors the rate at which the returning object was discarded because the (entity and stateless EJB) pool was full.	Measurement Threshold

WebSphere JDBC Connection Pool Status

The WebSphere JDBC Connection Pool Status Aspect monitors the JDBC connection availability and connection pools.

CI Type	Policy Template	Indicator	Description	Policy Type
j2eeserver	WebSphere_JDBCConnPoolWaiters	DataSourceConnectionWaiters:High / DataSourceConnectionWaiters:Normal, DataSourceConnectionWaiters:High / DataSourceConnectionWaiters:Norma	This policy template monitors	Measurement Threshold

CI Type	Policy Template	Indicator	Description	Policy Type
		l	the average number of threads waiting for a JDBC connection from connection pools for an application.	
j2eeserver	WebSphere_ JDBCConnPoolWaitTime	DataSourceConnectionPoolAvailability:Low / DataSourceConnectionPoolAvailability:Normal, DataSourceConnectionPoolAvailability:Low / DataSourceConnectionPoolAvailability:Normal	This policy template monitors the average time that a client waited for a JDBC connection in milliseconds for an application.	Measurement Threshold
j2eeserver	WebSphere_ JDBCConPoolThroughput	DataSourceConnectionPoolPerformance:Low / DataSourceConnectionPoolPerformance:Normal	This policy template monitors the number of JDBC connections allocated and returned by applicatio	Measurement Threshold

CI Type	Policy Template	Indicator	Description	Policy Type
			ns per second for an application.	
j2eeserver	WebSphere_JDBCConPoolThru	N/A	This policy template monitors the number of JDBC connections allocated and returned by applications per second.	ConfigFile
j2eeserver	WebSphere_JDBCConnPoolSize	N/A	This policy template monitors the average number of JDBC connections in the connection pool.	Measurement Threshold
j2eeserver	WebSphere_JDBCConnPoolTimeOutRts	DataSourceConnectionPoolAvailability:Low / DataSourceConnectionPoolAvailability:Normal, DataSourceConnectionPoolAvailability:Low / DataSourceConnectionPoolAvailability:Normal	This policy template monitors the number of times a client timed out	Measurement Threshold

CI Type	Policy Template	Indicator	Description	Policy Type
			waiting for a JDBC connection from the pool for an application per minute.	
j2eeserver	WebSphere_JDBCConPoolTimeRt	N/A	This policy template monitors the number of times a client timed out waiting for a JDBC connection from the pool per minute.	ConfigFile
j2eeserver	WebSphere_JDBCConPoolWtTime	N/A	This policy template monitors the average time that a client waited for a JDBC connection in milliseconds.	ConfigFile
j2eeserver	WebSphere_JDBCConnPoolMaxPct	N/A	This policy template monitors the	Measurement Threshold

CI Type	Policy Template	Indicator	Description	Policy Type
			percentage of time that all JDBC connections in a pool are in use.	
j2eeserver	WebSphere_JDBCConnPoolUtil	DataSourceConnectionPoolUtilization:High / DataSourceConnectionPoolUtilization:Normal, DataSourceConnectionPoolUtilization:High / DataSourceConnectionPoolUtilization:Normal	This policy template monitors the percentage of JDBC connection pool in use.	Measurement Threshold
j2eeserver	WebSphere_JDBCConPoolWait	N/A	This policy template monitors the average number of threads waiting for a JDBC connection from connection pools.	ConfigFile
j2eeserver	WebSphere_JDBCPreparedStDiscRt	DataSourceConnectionPoolPerformance:Low / DataSourceConnectionPoolPerformance:Normal	This policy template monitors the rate at which the prepared statements are	Measurement Threshold

CI Type	Policy Template	Indicator	Description	Policy Type
			discarded by the least recently used (LRU) algorithm of the statement cache.	

WebSphere JVM Heap Memory

The WebSphere JVM Heap Memory Aspect monitors the IBM WebSphere Application Server parameters.

CI Type	Policy Template	Indicator	Description	Policy Type
j2eeserver	WebSphere_ JVMMemFreePct	N/A	This policy template monitors the percentage of JVM free memory available.	ConfigFile
j2eeserver	WebSphere_ GarbageCollectionCt	TotalGarbageCollectionCount:High / TotalGarbageCollectionCount:Normal, TotalGarbageCollectionCount:High / TotalGarbageCollectionCount:Normal	This policy template monitors the garbage collection count.	Measurement Threshold
j2eeserver	WebSphere_ GarbageCollectionTime	TotalGarbageCollectionTime:High / TotalGarbageCollectionTime:Normal, TotalGarbageCollectionTime:High / TotalGarbageCollectionTime:Norm	This policy template monitors the garbage	Measurement Threshold

CI Type	Policy Template	Indicator	Description	Policy Type
		al	collection time.	
j2eeserver	WebSphere_JVMCpuUsagePct	N/A	This policy template monitors the CPU percentage usage of the JVM.	ConfigFile
j2eeserver	WebSphere_JVMMemUtilPct	JVMMemoryUtilization:High / JVMMemoryUtilization:Normal, JVMMemoryUtilization:High / JVMMemoryUtilization:Normal	This policy template monitors the percentage of heap space used in the JVM.	Measurement Threshold
j2eeserver	WebSphere_GCIntervalTime	N/A	This policy template monitors the average garbage collection value in seconds between two garbage collections.	ConfigFile
j2eeserver	WebSphere_ProcessCpuUsage	AllProcessorsAverageLoad:High / AllProcessorsAverageLoad:Normal, AllProcessorsAverageLoad:High / AllProcessorsAverageLoad:Normal	This policy template monitors the percentage of process CPU usage.	Measurement Threshold

WebSphere Server Status

The WebSphere Server Status Aspect monitors the availability and performance of IBM WebSphere Application Servers.

CI Type	Policy Template	Indicator	Description	Policy Type
j2eeserver	WebSphere_ ServerStatus	ServerStatus:Unavailable / ServerStatus:Available	This policy template monitors the status of the IBM WebSphere Application Servers.	Measurement Threshold

WebSphere Servlet Performance

The WebSphere Servlet Performance Aspect monitors the IBM WebSphere Application Server servlet sessions for web applications.

CI Type	Policy Template	Indicator	Description	Policy Type
j2eeserver	WebSphere_ WebAppServReqRt	N/A	This policy template monitors the number of servlet sessions being invalidated per second.	ConfigFile
j2eeserver	WebSphere_ WebAppServletRespTime	ServletPerformance:Low / ServletPerformance:Normal, ServletPerformance:Low / ServletPerformance:Normal	This policy template monitors the average response time for a web application servlet in milliseconds.	Measurement Threshold

CI Type	Policy Template	Indicator	Description	Policy Type
j2eeserver	WebSphere_ ServInvSessRt	N/A	This policy template monitors the number of servlet sessions being invalidated per second.	Measurement Threshold
j2eeserver	WebSphere_ ServSessActSess	ServerSessions:High / ServerSessions:Normal	This policy template monitors the number of servlet sessions currently being accessed.	Measurement Threshold
j2eeserver	WebSphere_ WebAppServErrRt	N/A	This policy template monitors the number of errors in a servlet per second.	ConfigFile
j2eeserver	WebSphere_ WebAppServErrRtApp	N/A	This policy template monitors the number of errors in a servlet per second for an application.	Measurement Threshold
j2eeserver	WebSphere_ WebAppServRelRt	NA	This policy template monitors the number of servlets reloaded for a web application per minute.	ConfigFile

CI Type	Policy Template	Indicator	Description	Policy Type
j2eeserver	WebSphere_ WebAppServReqRtApp	ServletRequests:High / ServletRequests:Normal	This policy template monitors the number of requests for a servlet per second for an application.	Measurement Threshold
j2eeserver	WebSphere_ ServSessAveLife	NA	This policy template monitors the average servlet session lifetime in milliseconds.	Measurement Threshold
j2eeserver	WebSphere_ WebAppServLoad	ServletsLoaded:High / ServletsLoaded:Normal	This policy template monitors the number of servlets currently loaded for a web application.	Measurement Threshold

WebSphere Thread Status

The WebSphere Thread Status Aspect monitors the thread status of IBM WebSphere Application Servers.

CI Type	Policy Template	Indicator	Description	Policy Type
j2eeserver	WebSphere_ CcrtThreadPlHngCt	N/A	This policy template monitors the number	ConfigFile

CI Type	Policy Template	Indicator	Description	Policy Type
			of concurrently hung threads.	
j2eeserver	WebSphere_ ThreadPoolHungRt	ThreadHungRate:High / ThreadHungRate:Normal	This policy template monitors the rate at which the threads are declared hung.	Measurement Threshold
j2eeserver	WebSphere_ ThreadPoolAveSize	N/A	This policy template monitors the average number of threads (active and idle) in a pool during collection interval.	ConfigFile
j2eeserver	WebSphere_ ThreadPoolUtilPct	ThreadPoolUtilization:High / ThreadPoolUtilization:Normal, ThreadPoolUtilization:High / ThreadPoolUtilization:Normal, ThreadPoolUtilization:High / ThreadPoolUtilization:Normal	This policy template monitors the percentage of threads used in a pool during collection interval	Measurement Threshold
j2eeserver	WebSphere_ ThreadPoolCrtRt	N/A	This policy template monitors the number of threads created per minute.	ConfigFile
j2eeserve	WebSphere_	N/A	This policy	ConfigFile

CI Type	Policy Template	Indicator	Description	Policy Type
r	ThreadPoolPctMax		template monitors the percentage of time number of threads in pool reached configured maximum size.	
j2eeserver	WebSphere_ ThreadPoolPctMaxApp	N/A	This policy template monitors the percentage of time number of threads in pool reached configured maximum size for an application.	Measurement Threshold
j2eeserver	WebSphere_ ThreadStartedCt	TotalNumberOfThreads:High / TotalNumberOfThreads:Normal, TotalNumberOfThreads:High / TotalNumberOfThreads:Normal	This policy template monitors the number of threads spawned for garbage collection.	Measurement Threshold
j2eeserver	WebSphere_ ThreadPoolActThreads	N/A	This policy template monitors the average number of active threads in a pool during collection	ConfigFile

CI Type	Policy Template	Indicator	Description	Policy Type
			interval.	

WebSphere Transaction Status

The WebSphere Transaction Status Aspect monitors the IBM WebSphere Application Server Transactions activities.

CI Type	Policy Template	Indicator	Description	Policy Type
j2eeserver	WebSphere_ TranLocDur	N/A	This policy template monitors the average duration of local transactions in milliseconds.	Measurement Threshold
j2eeserver	WebSphere_ TranGlobCommDur	N/A	This policy template monitors the average duration of commits for global transactions in milliseconds.	Measurement Threshold
j2eeserver	WebSphere_ TranLocCommDur	N/A	This policy template monitors the average duration of commits for local transactions in milliseconds.	Measurement Threshold

CI Type	Policy Template	Indicator	Description	Policy Type
j2eeserver	WebSphere_ TranRollbackRt	TransactionRollbackRate:High / TransactionRollbackRate:Normal	This policy template monitors the number of global and local transactions rolled back per second.	Measurement Threshold
j2eeserver	WebSphere_ TranCommitRt	TransactionCommitRate:High / TransactionCommitRate:Normal	This policy template monitors the number of global and local transactions that were committed per second	Measurement Threshold
j2eeserver	WebSphere_ TranStartRt	TransactionStartRate:High / TransactionStartRate:Normal	This policy template monitors the number of global and local transactions that were begun per second.	Measurement Threshold
j2eeserver	WebSphere_ TranTimeoutRte	TransactionTimeoutRate:High / TransactionTimeoutRate:Normal	This policy template monitors the number of global and local transactions that timed out per second.	Measurement Threshold
j2eeserver	WebSphere_ TranGlobDur	N/A	This policy template monitors the average	Measurement Threshold

CI Type	Policy Template	Indicator	Description	Policy Type
			duration of global transactions in milliseconds.	

Parameters

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

The parameters are grouped as follows:

- Instance Parameters - These parameters are essential for monitoring IBM WebSphere Application Servers. For example, WebSphere Server Home.
- Mandatory Parameters - These parameters contain the essential information required by policy templates. For example, WebSphere Username and WebSphere Password are mandatory parameters.
- Dependent Parameters - There are some parameters which are a subset of the mandatory parameters. Such parameters are referred to as dependent parameters.
- Expert Parameters - These parameters can be used by SMEs and Administrators. For example, Frequency of Medium Scheduler is an expert parameter.

Grouping of Parameters

Parameter	Parameter Type	Description	Default Values
WebSphere Application Server Profile Home	Instance	IBM WebSphere Application Server Profile Home	
WebSphere Username	Mandatory	Username corresponding to the profile	

WebSphere Password	Mandatory	Password corresponding to the profile	
WebSphere Server Home	Optional	IBM WebSphere Application Server home	
WebSphere JAVA Home	Optional	IBM WebSphere JAVA Home.	
WebSphere Application Server Port Number		IBM WebSphere Application Server Port Number	Default port value is SOAP. If the server is configured for RMI, port needs to be provided as a user input.
WebSphere Application Server SSL TrustStore File Path		IBM WebSphere Application Server SSL TrustStore File Path	
WebSphere Application Server SSL TrustStore File Password		IBM WebSphere Application Server SSL TrustStore File Password	****
WebSphere Application Server SSL KeyStore File Path		IBM WebSphere Application Server SSL KeyStore File Path	
WebSphere Application Server SSL KeyStore File Password		IBM WebSphere Application Server SSL KeyStore File Password	****
WebSphere Application Server JMX Connector Type		WebSphere Application Server JMX connector type can be SOAP/JSR160RMI.	Default value is SOAP. If server is configured for RMI, the value needs to be specified.
WebSphere Application Server Jar File Path		IBM Web Sphere Application Server jar file path.	

Frequency of WebSphere Text Logs	Expert	Frequency of monitoring WebSphere text logs with defined patterns.	30
Frequency of IBM WebSphere MP Log	Expert	Frequency for using WebSphere MP logs with defined patterns.	1
Frequency of VeryHigh Scheduler	Expert	Frequency for the scheduler which is expected to run on very short interval (in minutes).	5 Minutes
Frequency of High Scheduler	Expert	Frequency for the scheduler which is expected to run on short interval (in minutes).	15 Minutes
Frequency of Medium Scheduler	Expert	Frequency for the scheduler which is expected to run on medium interval (in hours).	1 Hour

Tuning Parameters

You can edit the parameters of the IBM WebSphere Management Templates and Aspects that are already deployed to the IBM WebSphere Application Server CIs.

To edit the parameters, follow these steps:

1. Open the Assignments & Tuning pane:

   On BSM 9.2x, click **Admin > Monitoring > Assignments & Tuning**.

   On OMi 10.x, click **Administration > Monitoring > Assignments & Tuning**.
2. In the **Browse Views** tab, select the **WebSphere_Deployment_View** view that contains the IBM WebSphere Application Server CI for which you want to tune parameters. Alternatively, you can use the **Search** tab to find a CI.
3. In the list of IBM WebSphere Application Server CIs, click a CI. The Assignments pane shows details of existing assignments for the 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. Select a parameter in the list, and then click  .
      i. For standard parameters, the Edit Parameter dialog box opens.

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

      ii. 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 Assignment Details pane, click **Save Changes**. Operations Management deploys the new parameter values to the relevant Operations Agent.

Configuration Items (CIs) and Configuration Item Types (CITs)

CIs are components that have to be managed in order to deliver an IT Service. CIs typically include IT Services, hardware, and software.

CIT describes the type of a CI and its attributes. The WebSphere CIs that are discovered in an environment are grouped under the CITs. OMi MP for IBM WebSphere Application Server comprises the following CITs:

- j2ee Domain
- websphereas
- JVM
- J2EE Application
- JDBC Data Source
- Oracle

Run-time Service Model (RTSM) Views

An RTSM View enables you to build and visualize a subset of the overall RTSM model. The RTSM Views for OMi MP for IBM WebSphere Application Server enables you to visualize the topology of IBM WebSphere Application Server environment that you want to monitor. The RTSM Views for OMi MP for

IBM WebSphere Application Server can be used to view and manage the Event Perspective and Health Perspective of the IBM WebSphere Application Server CIs discovered using WebSphere Discovery Aspect. You can also use RTSM Views for assigning and tuning the OMi MP for IBM WebSphere Application Server in the WebSphere Application Server environment.

How to Access RTSM Views

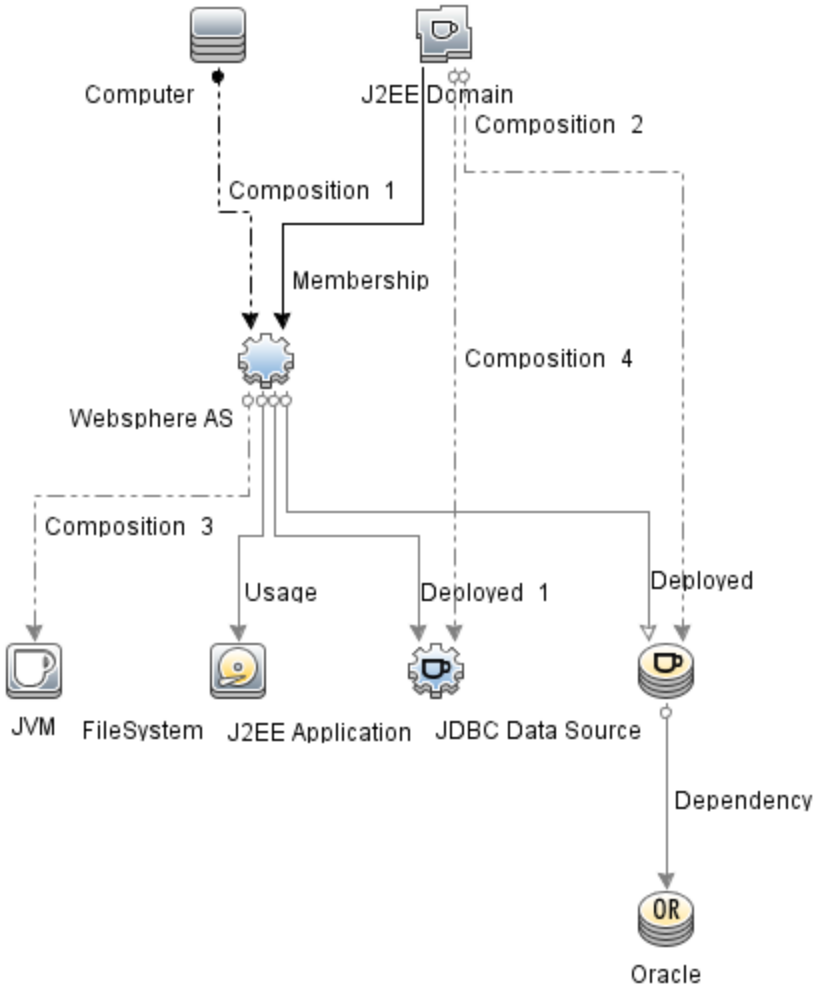
1. Open the RTSM Views:

   On BSM 9.23, click **Admin > RTSM Administration > Modeling > Modeling Studio**.

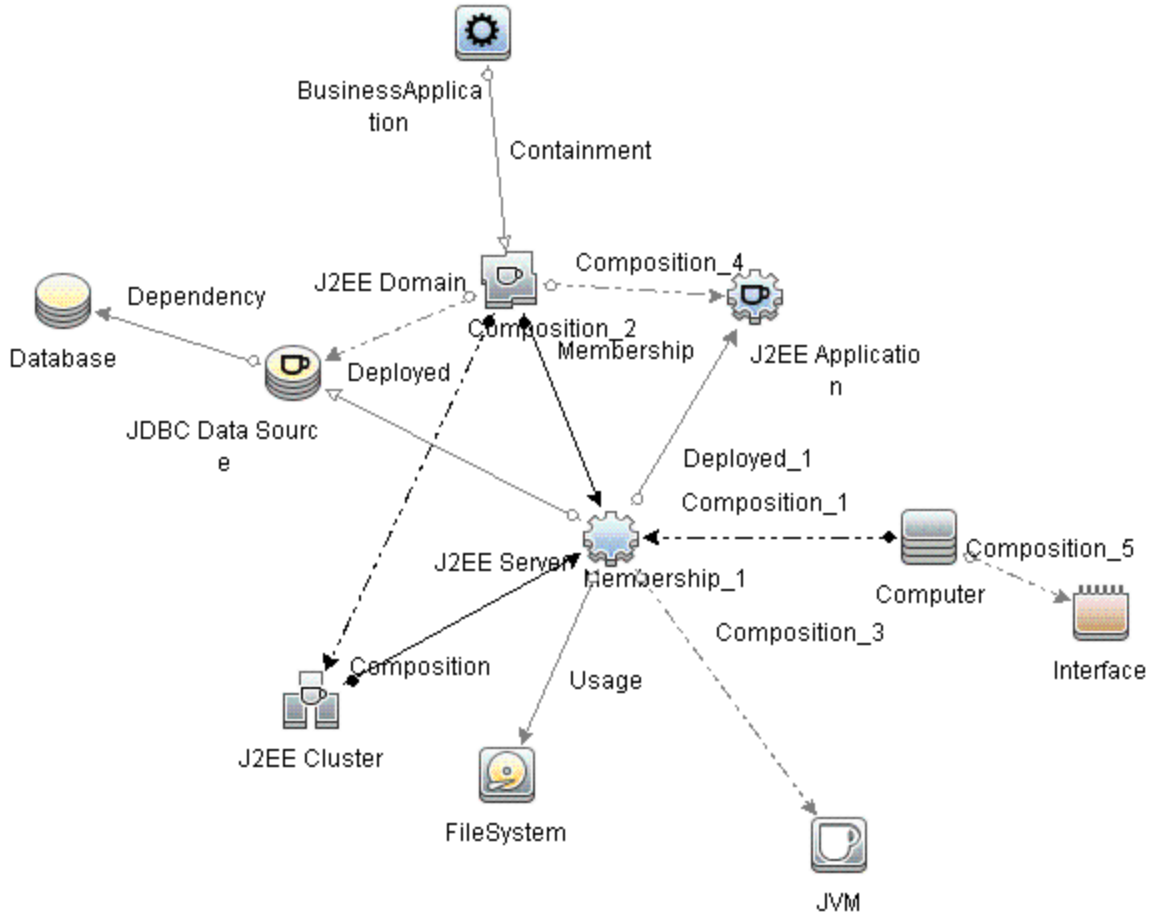
   On OMi 10.x, click **Administration > RTSM Administration > Modeling > Modeling Studio**.
2. Select Views from the **Resource Type** drop-down list.
3. Select **Operations Management > J2EE Application Servers**.

By default, OMi MP for IBM WebSphere Application Server contains the following RTSM Views:

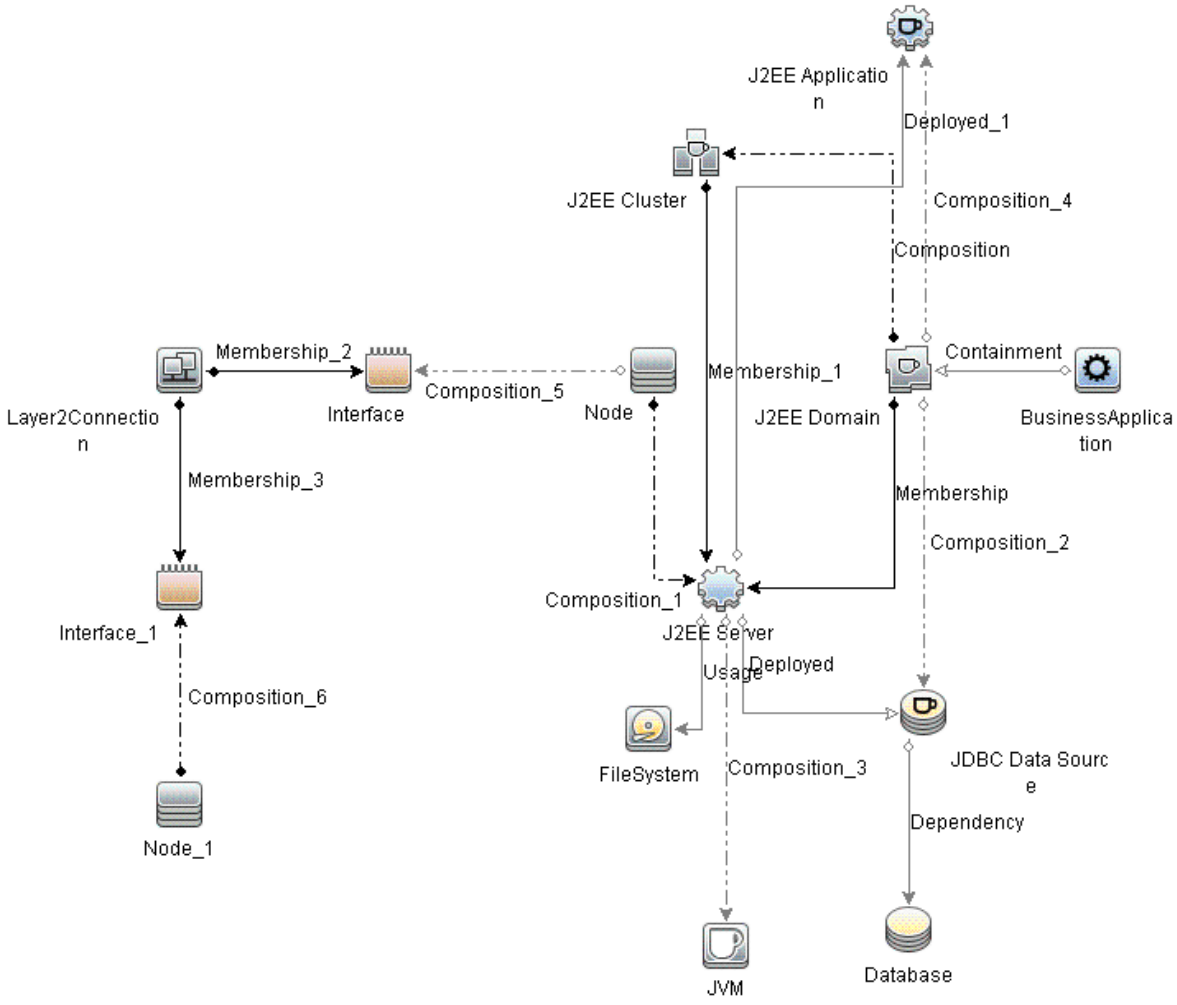
- **WebSphere_Deployment_View:** This RTSM view refers to the J2EE cluster, J2EE domain, JDBC data source, J2EE application, database, and computer, and Oracle CITs. The WebSphere_Deployment_View enables you to visualize the Event and Health perspectives of the IBM WebSphere Application Server CIs that you monitor. You can use the WebSphere_Deployment view for visualizing events that are specific to the monitored IBM WebSphere Application Servers. You can also use the **WebSphere_Deployment_View** view for assigning and tuning the OMi MP for IBM WebSphere Application Server deployment in the IBM WebSphere Application Server environment. In addition, you can use this view for monitoring composite applications. The following image shows the relationship among the CI types.



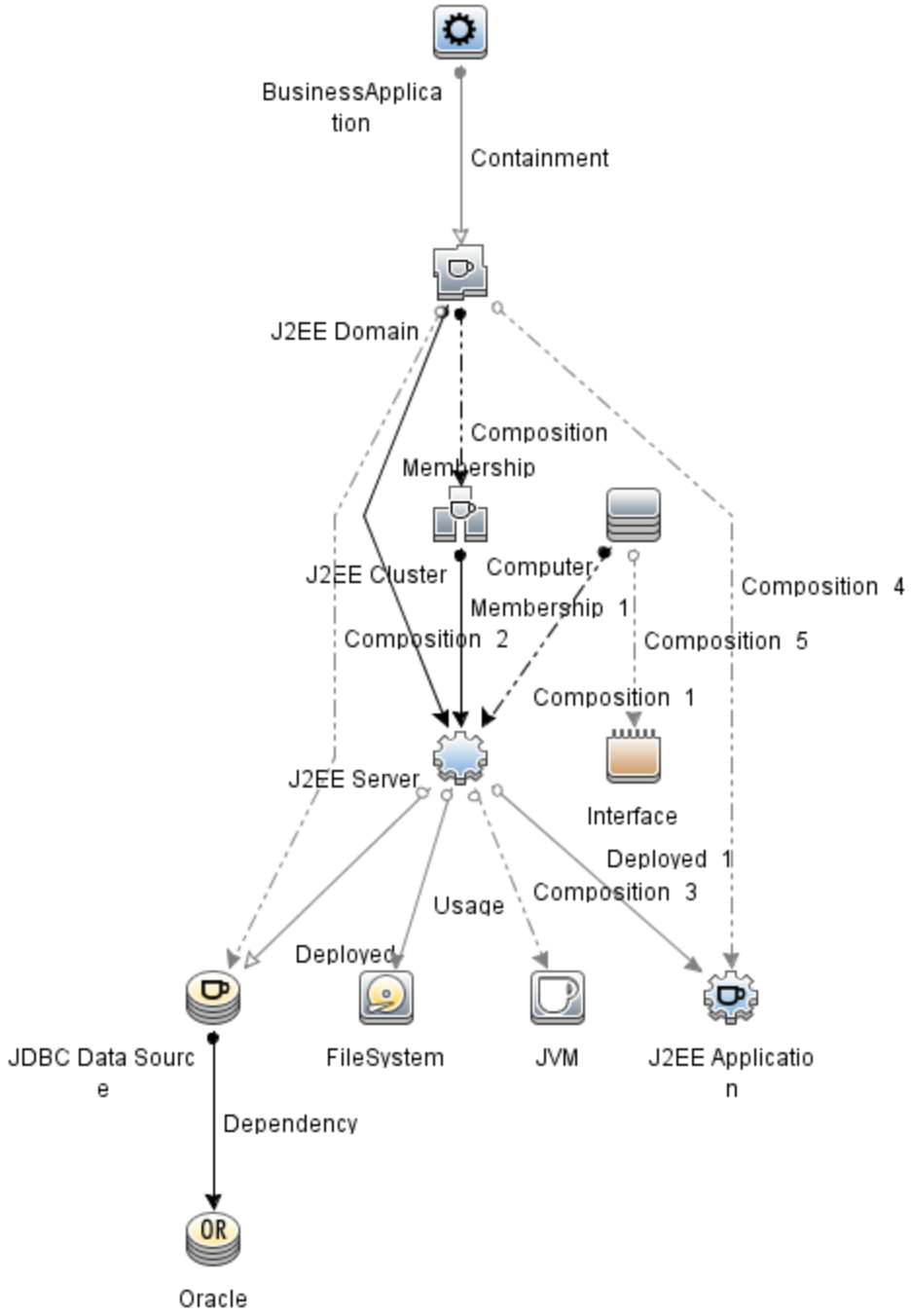
- **J2EE_Deployment:** This RTSM view refers to the J2EE cluster, J2EE domain, JDBC data source, J2EE application, database, and computer CI types. The J2EE_Deployment view enables you to visualize the Event and Health perspectives of the IBM WebSphere Application Server CIs that you monitor. You can use the J2EE_Deployment view for visualizing events that are specific to the monitored IBM WebSphere Application Servers. You can also use the **J2EE_Deployment** view for assigning and tuning the OMi MP for IBM WebSphere Application Server deployment in the IBM WebSphere Application Server environment. The following image shows the relationship among the CI types.



- **J2EE_Network_Deployment_View:** This RTSM view refers to the J2EE Cluster, J2EE Domain, J2EE Server, JDBC Data Source, J2EE Application, Database, and File System CI types. The J2EE_Network_Deployment_View enables you to visualize the components of an associated network along with the monitored IBM WebSphere Application Server CIs in your environment. The following image shows the relationship among the CI Types.



- **J2EE_Database_Deployment:** This view refers to the J2EE cluster, J2EE domain, JDBC data source, J2EE server, J2EE application, database, Oracle CIs, file system, and Computer CI types. The following image shows the relationship among the CI Types. The J2EE_Database_ Deployment view enables you to visualize the Event and Health perspectives of the IBM WebSphere Application Server CIs and Oracle database that you monitor.


BusinessApplica
tion
Containment
J2EE Domain
Composition
Membership
J2EE Cluster
Computer
Membership 1
Composition 2
Composition 4
Composition 5
Composition 1
J2EE Server
Interface
Deployed 1
Composition 3
Usage
Deployed
JDBC Data Sourc
e
FileSystem
JVM
J2EE Applicatio
n
Dependency
OR
Oracle

Topology based Event Correlation (TBEC) Rules

The OMi MP for IBM WebSphere Application Server includes the following rules to correlate IBM WebSphere Application Server related events:

> **Note:** For more information about using correlation rules, see the *Operations Manager i Concepts Guide*.

How to Access TBEC Rules

Open the Correlation rules:

On BSM 9.2x, click **Admin > Operations Management > Event Correlation**.

On OMi 10.x, click **Administration > Event Processing > Correlation > Topology -Based Event Correlation**.

J2EE::Computer:CPU Load >> JVM Memory Utilization & JMS Server Utilization & Transaction System Errors & EJB Performance

Description: Computer CPU Load Impacts JVM Memory Utilization and JMS Server Utilization and Transaction System Errors and EJB Performance		
Cause		
CIT: Computer	ETI: CPU Load	Value: Overloaded
Symptom 1		
CIT: J2EE Application	ETI: EJB Performance	Value: Low
Symptom 2		
CIT: J2EE Server	ETI: EJB Performance	Value: Low
Symptom 3		
CIT: J2EE Server	ETI: JMS Server Utilization	Value: High
Symptom 3		
CIT: J2EE Server	ETI: Transaction System Errors	Value: High
Symptom 4		
CIT: JVM	ETI: JVM Memory Utilization	Value: High

J2EE::Computer:CPU Load >> Real User Transaction Performance & Real User Sessions Performance

Description: Computer CPU Load Impacts Real User Transaction Performance and Real User Sessions Performance		
Cause		
CIT: Computer	ETI: CPU Load	Value: Overloaded
Symptom 1		
CIT: Business Application	ETI: Real User Sessions Performance	Value: Critical
Symptom 2		
CIT: Business Transaction	ETI: Real User Transaction Performance event	Value: Critical

J2EE::Computer:CPU Load >> Synthetic User Transaction Performance

Description: Computer CPU Load Impacts Synthetic User Transaction Performance		
Cause		
CIT: Computer	ETI: CPU Load	Value: Overloaded
Symptom 1		
CIT: Business Transaction	ETI: Synthetic User Transaction Performance event	Value: Critical

J2EE::Computer:Memory Usage Level >> Server Status & Transaction System Errors & Thread Hung Rage

Description: Computer Memory Usage Level Impacts Server Status and Transaction System Errors and Thread Hung Rate		
Cause		
CIT: Computer	ETI: Memory Usage Level	Value: Much Higher Than Normal
Symptom 1		
CIT: J2EE Server	ETI: Server Status	Value: Unavailable
Symptom 2		
CIT: J2EE Server	ETI: Thread Hung Rate	Value: High
Symptom 3		
CIT: J2EE Server	ETI: Transaction System Errors	Value: High

J2EE::Database:CPU Usage By SQL >> Transaction Timeout Errors & Transactions Rolled Back & EJB Performance & DataSource ConnectionPool Performance

Description: Database CPU Usage By SQL Impacts Transaction Timeout Errors and Transactions Rolled Back and EJB Performance and DataSource ConnectionPool Performance		
Cause		
CIT: Database	ETI: CPU Usage by SQL	Value: High
Symptom 1		
CIT: J2EE Application	ETI: EJB Performance	Value: Low
Symptom 2		
CIT: J2EE Server	ETI: DataSource Connection Pool Performance	Value: Low
Symptom 3		
CIT: J2EE Server	ETI: EJB Performance	Value: Low
Symptom 4		
CIT: J2EE Server	ETI: Transaction Timeout Errors	Value: High
Symptom 5		
CIT: J2EE Server	ETI: Transactions Rolled Back	Value: High
Symptom 6		
CIT: JDBC Data	ETI: Datasource Connection Pool Performance	Value: Low

J2EE::Database:Database Server Status >> DataSource ConnectionPool Availability

Description: Database Server Status Impacts DataSource ConnectionPool Availability		
Cause		
CIT: Database	ETI: Database Server Status	Value: Down
Symptom 1		
CIT: J2EE Server	ETI: Data Source Connection Pool Availability	Value: Low
Symptom 2		
CIT: JDBC Data Source	ETI: Data Source Connection Pool Availability	Value: Low

J2EE::Database:Database Server Status >> Real User Transaction Availability & Real User Sessions Availability

Description: Database Server Status Impacts Real User Transaction Availability and Real User Sessions Availability		
Cause		
CIT: Database	ETI: Database Server Status	Value: Down
Symptom 1		
CIT: Business Application	ETI: Real User Sessions Availability	Value: Critical
Symptom 2		
CIT: Business Transaction	ETI: Real User Transaction Availability event	Value: Critical

J2EE::Database:Database Server Status >> Synthetic User Transaction Availability

Description: Database Server Status Impacts Synthetic User Transaction Availability		
Cause		
CIT: Database	ETI: Database Server Status	Value: Down
Symptom 1		
CIT: Business Transaction	ETI: Synthetic User Transaction Availability event	Value: Critical

J2EE::Database:SQL Query Performance >> Transaction Timeout Errors & Transactions Rolled Back & EJB Performance & DataSource ConnectionPool Performance

Description: Database SQL Query Performance Impacts Transaction Timeout Errors and Transactions Rolled Back and EJB Performance and DataSource ConnectionPool Performance		
Cause		
CIT: Database	ETI: SQL Query Performance	Value: Low
Symptom 1		
CIT: J2EE Application	ETI: EJB Performance	Value: Low
Symptom 2		
CIT: J2EE Server	ETI: Datasource Connection Pool Performance	Value: Low

Description: Database SQL Query Performance Impacts Transaction Timeout Errors and Transactions Rolled Back and EJB Performance and DataSource ConnectionPool Performance		
Symptom 3		
CIT: J2EE Server	ETI: EJB Performance	Value: Low
Symptom 4		
CIT: J2EE Server	ETI: Transaction Timeout Errors	Value: High
Symptom 5		
CIT: J2EE Server	ETI: Transactions Rolled Back	Value: High
Symptom 4		
CIT: JDBC Data Source	ETI: Data Source Connection Pool Performance	Value: Low

J2EE::File System:Disk Usage Level >> Server Status & Transaction Resource Errors & Transaction System Errors

Description: File System Disk Usage Level Impacts Server Status and Transaction Resource Errors and Transaction System Errors		
Cause		
CIT: FileSystem	ETI: Disk Usage Level	Value: Near Capacity
Symptom 1		
CIT: J2EE Server	ETI: Server Status	Value: Unavailable
Symptom 2		
CIT: J2EE Server	ETI: Transaction Resource Errors	Value: High
Symptom 3		
CIT: J2EE Server	ETI: Transactions System Errors	Value: High

J2EE::J2EE Application:EJB Concurrent Lives >> EJB Utilization

Description: EJB Concurrent Lives Impacts EJB Utilization		
Cause		
CIT: J2EE Application	ETI: EJB Concurrent Lives	Value: High

Description: EJB Concurrent Lives Impacts EJB Utilization		
Symptom 1		
CIT: J2EE Application	ETI: EJB Utilization	Value: High
Symptom 2		
CIT: J2EE Server	ETI: EJB Utilization	Value: High

J2EE::J2EE Application:EJB Free Pool Wait Rate >> Servlet Performance

Description: EJB Free Pool Wait Rate Impacts Servlet Performance		
Cause		
CIT: J2EE Application	ETI: EJB Free Pool Wait Rate	Value: High
Symptom 1		
CIT: J2EE Application	ETI: Servlet Performance	Value: Low
Symptom 2		
CIT: J2EE Server	ETI: Servlet Performance	Value: Low

J2EE::J2EE Application:EJB Performance >> EJB Free Pool Wait Rate & EJB Missed Count Rate & Servlet Performance

Description: EJB Performance Impacts EJB Free Pool Wait Rate and EJB Missed Count Rate and Servlet Performance		
Cause		
CIT: J2EE Application	ETI: EJB Performance	Value: Low
Symptom 1		
CIT: J2EE Application	ETI: EJB Free Pool Wait Rate	Value: High
Symptom 2		
CIT: J2EE Application	ETI: EJB Missed Count Rate	Value: High
Symptom 3		
CIT: J2EE Application	ETI: Servlet Performance	Value: Low
Symptom 4		
CIT: J2EE Server	ETI: EJB Free Pool Wait Rate	Value: High
Symptom 5		

Description: EJB Performance Impacts EJB Free Pool Wait Rate and EJB Missed Count Rate and Servlet Performance		
CIT: J2EE Server	ETI: EJB Missed Count Rate	Value: High
Symptom 6		
CIT: J2EE Server	ETI: Servlet Performance	Value: Low

J2EE::J2EE Application:EJB Timeout Rate >> Servlet Performance & EJB Transaction Throughput Rate & EJB Transaction Rollback Rate

Description: EJB Timeout Rate Impacts Servlet Performance and EJB Transaction Throughput Rate and EJB Transaction Rollback Rate		
Cause		
CIT: J2EE Application	ETI: EJB Timeout Rate	Value: High
Symptom 1		
CIT: J2EE Application	ETI: EJB Transaction Rollback Rate	Value: High
Symptom 2		
CIT: J2EE Application	ETI: EJB Transaction Throughput Rate	Value: High
Symptom 3		
CIT: J2EE Application	ETI: Servlet Performance	Value: Low
Symptom 4		
CIT: J2EE Server	ETI: EJB Transaction Rollback Rate	Value: High
Symptom 5		
CIT: J2EE Server	ETI: Servlet Performance	Value: Low

J2EE::J2EE Application:EJB Utilization >> DataSource Connection Waiters & DataSource Connection Pool Utilization

Description: EJB Utilization Impacts DataSource Connection Waiters and DataSource Connection Pool Utilization		
Cause		
CIT: J2EE Application	ETI: EJB Utilization	Value: High
Symptom 1		

Description: EJB Utilization Impacts DataSource Connection Waiters and DataSource Connection Pool Utilization		
CIT: J2EE Server	Data Source Connection Pool Utilization	Value: High
Symptom 2		
CIT: J2EE Server	ETI: Data Source Connection Waiters	Value: High
Symptom 3		
CIT: JDBC Data Source	ETI: Data Source Connection Waiters	Value: High
Symptom 4		
CIT: JDBC Data Source	ETI: Data Source Connection Pool Utilization	Value: High

J2EE::J2EE Application:HTTP Sessions >> JVM Memory Utilization

Description: J2EE Application HTTP Sessions Impacts JVM Memory Utilization		
Cause		
CIT: J2EE Application	ETI: HTTP Sessions	Value: High
Symptom 1		
CIT: J2EE Server	ETI: JVM Memory Utilization	Value: High
Symptom 2		
CIT: JVM	ETI: JVM Memory Utilization	Value: High

J2EE::J2EE Application:Servlet Requests >> InterfaceUtilization

Description: J2EE Application Servlet Requests Impacts Interface Utilization		
Cause		
CIT: J2EE Application	ETI: Servlet Requests	Value: High
Symptom		
CIT: Interface	ETI: InterfaceUtilization	Value: Much Higher Than Normal

J2EE::J2EE Application:Servlet Requests >> Real User Transaction Performance & Real User Sessions Performance

Description: J2EE Application Servlet Requests Impacts Real User Transaction Performance and Real User Sessions Performance		
Cause		
CIT: J2EE Application	ETI: Servlet Requests	Value: High
Symptom 1		
CIT: Business Application	ETI: Real User Sessions Performance	Value: Critical
Symptom 2		
CIT: Business Transaction	ETI: Real User Transaction Performance event	Value: Critical

J2EE::J2EE Application:Servlet Requests >> Synthetic User Transaction Performance

Description: J2EE Application Servlet Requests Impacts Synthetic User Transaction Performance		
Cause		
CIT: J2EE Application	ETI: Servlet Requests	Value: High
Symptom 1		
CIT: Business Application	ETI: Synthetic User Transaction Performance event	Value: Critical

J2EE::J2EE Application:Servlet Requests >> Thread Pool Utilization & Active Sockets Count & JVM Memory Utilization & HTTP Sessions & Thread Requests Pending & Servlets Loaded & Interface Discard Rate & Interface Utilization

Description: J2EE Application Servlet Requests Impacts Thread Pool Utilization and Active Sockets Count and JVM Memory Utilization and HTTP Sessions and Thread Requests Pending and Servlets Loaded and Interface Discard Rate and Interface Utilization		
Cause		
CIT: J2EE Application	ETI: Servlet Requests	Value: High
Symptom 1		
CIT: Interface	ETI: Interface Discard Rate	Value: High
Symptom 2		
CIT: Interface	ETI: Interface Utilization	Value: High
Symptom 3		
CIT: Interface	ETI: Interface Utilization	Value: Higher Than Normal

Description: J2EE Application Servlet Requests Impacts Thread Pool Utilization and Active Sockets Count and JVM Memory Utilization and HTTP Sessions and Thread Requests Pending and Servlets Loaded and Interface Discard Rate and Interface Utilization		
Symptom 4		
CIT: J2EE Application	ETI: HTTP Sessions	Value: High
Symptom 5		
CIT: J2EE Server	ETI: Active Sockets Count	Value: High
Symptom 6		
CIT: J2EE Server	ETI: HTTP Sessions	Value: High
Symptom 7		
CIT: J2EE Server	ETI: JVM Memory Utilization	Value: High
Symptom 8		
CIT: J2EE Server	ETI: Servlets Loaded	Value: High
Symptom 9		
CIT: J2EE Server	ETI: Thread Pool Utilization	Value: High
Symptom 10		
CIT: J2EE Server	ETI: Thread Requests Pending	Value: High
Symptom 11		
CIT: JVM	ETI: JVM Memory Utilization	Value: High

J2EE::J2EE Cluster:Cluster Health >> Domain Status

Description: J2EE Cluster Health Impacts Domain Status		
Cause		
CIT: J2EE Cluster	ETI: Cluster Health	Value: Poor
Symptom 1		
CIT: J2EE Domain	ETI: Domain Status	Value: Poor

J2EE::J2EE Cluster:Cluster Health >> Real User Transaction Performance & Real User Sessions Performance

Description: J2EE Cluster Health Impacts Real User Transaction Performance and Real User Sessions Performance		
Cause		
CIT: J2EE Cluster	ETI: Cluster Health	Value: Poor
Symptom 1		
CIT: Business Application	ETI: Real User Sessions Performance	Value: Critical
Symptom 2		
CIT: Business Application	ETI: Real User Transaction Performance event	Value: Critical

J2EE::J2EE Cluster:Cluster Health >> Synthetic User Transaction Performance

Description: J2EE Cluster Health Impacts Synthetic User Transaction Performance		
Cause		
CIT: J2EE Cluster	ETI: Cluster Health	Value: Poor
Symptom 1		
CIT: Business Application	ETI: Synthetic User Transaction Performance event	Value: Critical

J2EE::J2EE Cluster:Cluster Status >> Domain Status

Description: J2EE Cluster Status Impacts Domain Status		
Cause		
CIT: J2EE Cluster	ETI: Cluster Status	Value: Stopped
Symptom 1		
CIT: J2EE Domain	ETI: Domain Status	Value: Poor

J2EE::J2EE Cluster:Cluster Status >> Real User Transaction Availability & Real User Sessions Availability

Description: J2EE Cluster Status Impacts Real User Transaction Availability and Real User Sessions Availability		
Cause		
CIT: J2EE Cluster	ETI: Cluster Status	Value: Stopped
Symptom 1		

Description: J2EE Cluster Status Impacts Real User Transaction Availability and Real User Sessions Availability		
CIT: Business Application	ETI: Real User Sessions Availability	Value: Critical
Symptom 2		
CIT: Business Application	ETI: Real User Transaction Availability event	Value: Critical

J2EE::J2EE Cluster:Cluster Status >> Synthetic User Transaction Availability

Description: J2EE Cluster Status Impacts Synthetic User Transaction Availability		
Cause		
CIT: J2EE Cluster	ETI: Cluster Status	Value: Stopped
Symptom 1		
CIT: Business Transaction	ETI: Synthetic User Transaction Availability event	Value: Critical

J2EE::J2EE Server:DataSource Connection Pool Availability >> EJBPerformance & Transaction Timeout Rate & Transaction Commit Rate

Description: J2EE Server DataSource Connection Pool Availability Impacts EJBPerformance and Transaction Timeout Rate and Transaction Commit Rate		
Cause		
CIT: J2EE Server	ETI: Data Source Connection Pool Availability	Value: Low
Symptom 1		
CIT: J2EE Application	ETI: EJB Performance	Value: Low
Symptom 2		
CIT: J2EE Server	ETI: EJB Performance	Value: Low
Symptom 3		
CIT: J2EE Server	ETI: Transaction Commit Rate	Value: High
Symptom 4		
CIT: J2EE Server	ETI: Transaction Timeout Rate	Value: High

J2EE::J2EE Server:DataSource Connection Pool Performance >> EJB Performance

Description: J2EE Server DataSource Connection Pool Performance Impacts EJB Performance		
Cause		
CIT: J2EE Server	ETI: Data Source Connection Pool Performance	Value: Low
Symptom 1		
CIT: J2EE Application	ETI: EJB Performance	Value: Low
Symptom 2		
CIT: J2EE Server	ETI: EJB Performance	Value: Low

J2EE::J2EE Server:DataSource Connection Waiters >> DataSource Connection Pool Availability

Description: J2EE Server DataSource Connection Waiters Impacts DataSource Connection Pool Availability		
Cause		
CIT: J2EE Server	ETI: Data Source Connection Waiters	Value: High
Symptom 1		
CIT: J2EE Server	ETI: Data Source Connection Pool Availability	Value: Low
Symptom 2		
CIT: JDBC Data Source	ETI: Data Source Connection Pool Availability	Value: Low

J2EE::J2EE Server:DataSource ConnectionPool Utilization >> Transaction Capacity Utilization & JDBC Connection Pool Wait Count & Transaction Time & Transaction Commit Rate & Transaction Start Rate & DataSource Connection Pool Availability

Description: J2EE Server DataSource ConnectionPool Utilization Impacts Transaction Capacity Utilization and JDBC Connection Pool Wait Count and Transaction Time and Transaction Commit Rate and Transaction Start Rate and DataSource Connection Pool Availability		
Cause		
CIT: J2EE Server	ETI: Data Source Connection Pool Utilization	Value: High

Description: J2EE Server DataSource ConnectionPool Utilization Impacts Transaction Capacity Utilization and JDBC Connection Pool Wait Count and Transaction Time and Transaction Commit Rate and Transaction Start Rate and DataSource Connection Pool Availability		
Symptom 1		
CIT: J2EE Server	ETI: Data Source Connection Pool Availability	Value: Low
Symptom 2		
CIT: J2EE Server	ETI: JDBC Connection Pool Wait Count	Value: High
Symptom 3		
CIT: J2EE Server	ETI: Transaction Capacity Utilization	Value: High
Symptom 4		
CIT: J2EE Server	ETI: Transaction Commit Rate	Value: High
Symptom 5		
CIT: J2EE Server	ETI: Transaction Start Date	Value: High
Symptom 6		
CIT: J2EE Server	ETI: Transaction Time	Value: High
Symptom 7		
CIT: JDBC Data Source	ETI: Data Source Connection Pool Availability	Value: Low
Symptom 8		
CIT: JDBC Data Source	ETI: JDBC Connection Pool Wait Count	Value: High

J2EE::J2EE Server:EJB Concurrent Lives >> EJB Utilization

Description: EJB Concurrent Lives Impacts EJB Utilization		
Cause		
CIT: J2EE Server	ETI: EJB Concurrent Lives	Value: High
Symptom 1		
CIT: J2EE Application	ETI: EJB Utilization	Value: High

Description: EJB Concurrent Lives Impacts EJB Utilization		
Symptom 2		
CIT: J2EE Server	ETI: EJB Utilization	Value: High

J2EE::J2EE Server:EJB Free Pool Wait Rate >> Servlet Performance

Description: EJB Free Pool Wait Rate Impacts Servlet Performance		
Cause		
CIT: J2EE Server	ETI: EJB Free Pool Wait Rate	Value: High
Symptom 1		
CIT: J2EE Application	ETI: Servlet Performance	Value: Low
Symptom 2		
CIT: J2EE Server	ETI: Servlet Performance	Value: Low

J2EE::J2EE Server:EJB Performance >> EJB Free Pool Wait Rate & EJB Missed Count Rate & Servlet Performance

Description: EJB Performance Impacts EJB Free Pool Wait Rate and EJB Missed Count Rate and Servlet Performance		
Cause		
CIT: J2EE Server	ETI: EJB Performance	Value: Low
Symptom 1		
CIT: J2EE Application	ETI: EJB Free Pool Wait Rate	Value: High
Symptom 2		
CIT: J2EE Application	ETI: EJB Missed Count Rate	Value: High
Symptom 3		
CIT: J2EE Application	ETI: Servlet Performance	Value: Low
Symptom 4		
CIT: J2EE Server	ETI: EJB Free Pool Wait Rate	Value: High
Symptom 5		
CIT: J2EE Server	ETI: EJB Missed Count Rate	Value: High
Symptom 6		
CIT: J2EE Server	ETI: Servlet Performance	Value: Low

J2EE::J2EE Server:EJB Timeout Rate >> Servlet Performance & EJB Transaction Throughput Rate & EJB Transaction Rollback Rate

Description: EJB Timeout Rate Impacts Servlet Performance and EJB Transaction Throughput Rate and EJB Transaction Rollback Rate		
Cause		
CIT: J2EE Server	ETI: EJB Timeout Rate	Value: High
Symptom 1		
CIT: J2EE Application	ETI: EJB Transaction Rollback Rate	Value: High
Symptom 2		
CIT: J2EE Application	ETI: EJB Transaction Throughput Rate	Value: High
Symptom 3		
CIT: J2EE Application	ETI: EJB Transaction Rollback Rate	Value: High
Symptom 4		
CIT: J2EE Server	ETI: Servlet Performance	Value: Low

J2EE::J2EE Server:EJB Utilization >> DataSource Connection Waiters & DataSource Connection Pool Utilization

Description: EJB Utilization Impacts DataSource Connection Waiters and DataSource Connection Pool Utilization		
Cause		
CIT: J2EE Server	ETI: EJB Utilization	Value: High
Symptom 1		
CIT: J2EE Server	ETI: DataSource Connection Pool Utilization	Value: High
Symptom 2		
CIT: J2EE Server	ETI: DataSource Connection Waiters	Value: High
Symptom 3		
CIT: JDBC Data Source	ETI: DataSource Connection Waiters	Value: High

Description: EJB Utilization Impacts DataSource Connection Waiters and DataSource Connection Pool Utilization		
Symptom 4		
CIT: JDBC Data Source	ETI: DataSource Connection Pool Utilization	Value: High

J2EE::J2EE Server:HTTP Sessions >> JVM Memory Utilization

Description: J2EE Server HTTP Sessions Impacts JVM Memory Utilization		
Cause		
CIT: J2EE Server	ETI: HTTP Sessions	Value: High
Symptom 1		
CIT: J2EE Server	ETI: JVM Memory Utilization	Value: High
Symptom 2		
CIT: JVM	ETI: JVM Memory Utilization	Value: High

J2EE::J2EE Server:JVM Memory Utilization >> Real User Transaction Performance & Real User Sessions Performance

Description: J2EE Server Memory Utilization Impacts Real User Transaction Performance and Real User Sessions Performance		
Cause		
CIT: J2EE Server	ETI: JVM Memory Utilization	Value: High
Symptom 1		
CIT: Business Application	ETI: Real User Sessions Performance	Value: Critical
Symptom 2		
CIT: Business Application	ETI: Real User Transaction Performance event	Value: Critical
Symptom 3		
CIT: J2EE Application	ETI: EJB Transaction Rollback Rate	Value: High
Symptom 4		
CIT: J2EE Server	ETI: Servlet Performance	Value: Low

J2EE::J2EE Server:JVM Memory Utilization >> Synthetic User Transaction Performance

Description: J2EE Server Memory Utilization Impacts Synthetic User Transaction Performance		
Cause		
CIT: J2EE Server	ETI: JVM Memory Utilization	Value: High
Symptom 1		
CIT: Business Application	ETI: Synthetic User Transaction Performance event	Value: Critical

J2EE::J2EE Server:JVM Memory Utilization >> Transaction Time & Transaction System Errors & Servlet Performance

Description: J2EE Server JVMMemoryUtilization Impacts Transaction Time and Transaction System Errors and Servlet Performance		
Cause		
CIT: J2EE Server	ETI: JVM Memory Utilization	Value: High
Symptom 1		
CIT: J2EE Application	ETI: Servlet Performance	Value: Low
Symptom 2		
CIT: J2EE Server	ETI: Servlet Performance	Value: Low
Symptom 3		
CIT: J2EE Server	ETI: Transaction System Errors	Value: High
Symptom 4		
CIT: J2EE Server	ETI: Transaction Time	Value: High

J2EE::J2EE Server:Server Sessions >> JVM Memory Utilization

Description: J2EE Server Sessions Impact JVM Memory Utilization		
Cause		
CIT: J2EE Server	ETI: Server Sessions	Value: High
Symptom 1		
CIT: J2EE Server	ETI: JVM Memory Utilization	Value: High
Symptom 2		
CIT: JVM	ETI: JVM Memory Utilization	Value: High

J2EE::J2EE Server:Server Status >> Domain Status & Cluster Health & Cluster Status

Description: J2EE Server Status Impacts Domain Status and Cluster Health and Cluster Status		
Cause		
CIT: J2EE Server	ETI: Server Status	Value: Unavailable
Symptom 1		
CIT: J2EE Cluster	ETI: Cluster Health	Value: Poor
Symptom 2		
CIT: J2EE Cluster	ETI: Cluster Status	Value: Partial Stop
Symptom 3		
CIT: J2EE Cluster	ETI: Cluster Status	Value: Stopped

J2EE::J2EE Server:Server Status >> Real User Transaction Availability & Real User Sessions Availability

Description: J2EE Server Status Impacts Real User Transaction Availability and Real User Sessions Availability		
Cause		
CIT: J2EE Server	ETI: Server Status	Value: Unavailable
Symptom 1		
CIT: Business Application	ETI: Real User Sessions Availability	Value: Critical
Symptom 2		
CIT: Business Application	ETI: Real User Transaction Availability event	Value: Critical

J2EE::J2EE Server:Server Status >> Synthetic User Transaction Availability

Description: J2EE Server Status Impacts Synthetic User Transaction Availability		
Cause		
CIT: J2EE Server	ETI: Server Status	Value: Unavailable
Symptom 1		
CIT: Business Application	ETI: Synthetic User Transaction Availability event	Value: Critical

J2EE::J2EE Server:Servlet Requests >> Real User Transaction Performance & Real User Sessions Performance

Description: J2EE Server Servlet Requests Impacts Real User Transaction Performance and Real User Sessions Performance		
Cause		
CIT: J2EE Server	ETI: Servlet Requests	Value: High
Symptom 1		
CIT: Business Application	ETI: Real User Sessions Performance	Value: Critical
Symptom 2		
CIT: Business Application	ETI: Real User Transaction Performance event	Value: Critical

J2EE::J2EE Server:Servlet Requests >> Synthetic User Transaction Performance

Description: J2EE Server Servlet Requests Impacts Synthetic User Transaction Performance		
Cause		
CIT: J2EE Server	ETI: Servlet Requests	Value: High
Symptom 1		
CIT: Business Application	ETI: Synthetic User Transaction Performance event	Value: Critical

J2EE::J2EE Server:Servlet Requests >> Thread Pool Utilization & Active Sockets Count & JVM Memory Utilization & HTTP Sessions & Thread Requests Pending & Servlets Loaded & Interface Discard Rate & Interface Utilization

Description: J2EE Server Servlet Requests Impacts Thread Pool Utilization and Active Sockets Count and JVM Memory Utilization and HTTP Sessions and Thread Requests Pending and Servlets Loaded and Interface Discard Rate and Interface Utilization		
Cause		
CIT: J2EE Server	ETI: Servlet Requests	Value: High
Symptom 1		
CIT: Interface	ETI: Interface Discard Rate	Value: High
Symptom 2		
CIT: Interface	ETI: Interface Utilization	Value: Higher Than Normal

Description: J2EE Server Servlet Requests Impacts Thread Pool Utilization and Active Sockets Count and JVM Memory Utilization and HTTP Sessions and Thread Requests Pending and Servlets Loaded and Interface Discard Rate and Interface Utilization		
Symptom 3		
CIT: J2EE Server	ETI: Active Sockets Count	Value: High
Symptom 4		
CIT: J2EE Server	ETI: JVM Memory Utilization	Value: High
Symptom 5		
CIT: J2EE Server	ETI: Servlets Loaded	Value: High
Symptom 6		
CIT: J2EE Server	ETI: Thread Pool Utilization	Value: High
Symptom 7		
CIT: J2EE Server	ETI: Thread Requests Pending	Value: High
Symptom 8		
CIT: JVM	ETI: JVM Memory Utilization	Value: High

J2EE::J2EE Server:Servlets Loaded >> JVM Memory Utilization

Description: J2EE Server Status Impacts Real User Transaction Availability and Synthetic User Transaction Availability and Real User Sessions Availability		
Cause		
CIT: J2EE Server	ETI: Servlets Loaded	Value: High
Symptom 1		
CIT: J2EE Server	ETI: JVM Memory Utilization	Value: High
Symptom 1		
CIT: JVM	ETI: JVM Memory Utilization	Value: High

J2EE::J2EE Server:ThreadPoolUtilization >> ExecuteQueueWaitCount & ActiveSocketsCount & ServletPerformance & DeferredThreadRequests & ThreadRequestWaitTime & ThreadRequestsPending & ThreadRequestServiceTime & ThreadPoolAvailability & JVMMemoryUtilization

Description: J2EE Server Thread Pool Utilization Impacts Execute Queue Wait Count and Active Sockets Count and Servlet Performance and Deferred Thread Requests and Thread Request Wait Time and Thread Requests Pending and Thread Request Service Time and Thread Pool Availability and JVM Memory Utilization		
Cause		
CIT: J2EE Server	ETI: Thread Pool Utilization	Value: High
Symptom 1		
CIT: J2EE Application	ETI: Servlet Performance	Value: Low
Symptom 2		
CIT: J2EE Server	ETI: Active Sockets Count	Value: High
Symptom 3		
CIT: J2EE Server	ETI: Deferred Thread Requests	Value: High
Symptom 4		
CIT: J2EE Server	ETI: Execute Queue Wait Count	Value: High
Symptom 5		
CIT: J2EE Server	ETI: JVM Memory Utilization	Value: High
Symptom 6		
CIT: J2EE Server	ETI: Servlet Performance	Value: Low
Symptom 7		
CIT: J2EE Server	ETI: Thread Pool Availability	Value: Low
Symptom 8		
CIT: J2EE Server	ETI: Thread Request Service Time	Value: High
Symptom 9		
CIT: J2EE Server	ETI: Thread Request Wait Time	Value: High
Symptom 10		
CIT: J2EE Server	ETI: Thread Requests Pending	Value: High
Symptom 11		
CIT: JVM	ETI: JVM Memory Utilization	Value: High

J2EE::J2EE Server:Total Garbage Collection Count >> CPU Load

Description: J2EE Server Total Garbage Collection Count Impacts CPU Load		
Cause		
CIT: J2EE Server	ETI: Total Garbage Collection Count	Value: High
Symptom 1		
CIT: Computer	ETI: CPU Load	Value: Overloaded

J2EE::J2EE Server:Total Garbage Collection Time >> CPU Load

Description: J2EE Server Total Garbage Collection Time Impacts CPU Load		
Cause		
CIT: J2EE Server	ETI: Total Garbage Collection Time	Value: High
Symptom 1		
CIT: Computer	ETI: CPU Load	Value: Overloaded

J2EE::J2EE Server:Total Number of Threads >> CPU Load & Memory Usage Level

Description: J2EE Server Total Number Of Threads Impacts CPU Load and Memory Usage Level		
Cause		
CIT: J2EE Server	ETI: Total Number Of Threads	Value: High
Symptom 1		
CIT: Computer	ETI: CPU Load	Value: Overloaded
Symptom 2		
CIT: Computer	ETI: Memory Usage Level	Value: Higher Than Normal
Symptom 3		
CIT: Computer	ETI: Memory Usage Level	Value: Much Higher Than Normal

J2EE::J2EE Server:Transaction Application Errors >> Transactions Rolled Back

Description: J2EE Server Transaction Application Errors Impacts Transactions Rolled Back		
Cause		
CIT: J2EE Server	ETI: Transaction Application Errors	Value: High
Symptom 1		

Description: J2EE Server Transaction Application Errors Impacts Transactions Rolled Back		
CIT: J2EE Server	ETI: Transactions Rolled Back	Value: High

J2EE::J2EE Server:Transaction Resource Errors >> Transactions Rolled Back

Description: J2EE Server Transaction Resource Errors Impacts Transactions Rolled Back		
Cause		
CIT: J2EE Server	ETI: Transaction Resource Errors	Value: High
Symptom 1		
CIT: J2EE Server	ETI: Transactions Rolled Back	Value: High

J2EE::J2EE Server:Transaction System Errors >> Transactions Rolled Back

Description: J2EE Server Transaction System Errors Impacts Transactions Rolled Back		
Cause		
CIT: J2EE Server	ETI: Transaction System Errors	Value: High
Symptom 1		
CIT: J2EE Server	ETI: Transactions Rolled Back	Value: High

J2EE::J2EE Server:Transaction Time >> JDBC Connection Pool Wait Count

Description: J2EE Server Transaction Time Impacts JDBC Connection Pool Wait Count		
Cause		
CIT: J2EE Server	ETI: Transaction Time	Value: High
Symptom 1		
CIT: J2EE Server	ETI: JDBC Connection Pool Wait Count	Value: High
Symptom 2		
CIT: JDBC Data Source	ETI: JDBC Connection Pool Wait Count	Value: High

J2EE::J2EE Server:Transaction Timeout Errors >> Transactions Rolled Back

Description: J2EE Server Transaction Timeout Errors Impacts Transactions Rolled Back		
Cause		
CIT: J2EE Server	ETI: Transaction Timeout Errors	Value: High

Description: J2EE Server Transaction Timeout Errors Impacts Transactions Rolled Back		
Symptom 1		
CIT: J2EE Server	ETI: Transactions Rolled Back	Value: High

J2EE::JDBC Data Source:DataSource Connection Pool Availability >> EJBPerformance & Transaction Timeout Rate & Transaction Commit Rate

Description: JDBC DataSource Connection Pool Availability Impacts EJBPerformance and Transaction Timeout Rate and Transaction Commit Rate		
Cause		
CIT: JDBC Data Source	ETI: Data Source Connection Pool Availability	Value: Low
Symptom 1		
CIT: J2EE Application	ETI: EJB Performance	Value: Low
Symptom 2		
CIT: J2EE Server	ETI: EJB Performance	Value: Low
Symptom 3		
CIT: J2EE Server	ETI: Transaction Commit Rate	Value: High
Symptom 4		
CIT: J2EE Server	ETI: Transaction Timeout Rate	Value: High

J2EE::JDBC Data Source:DataSource Connection Pool Performance >> EJB Performance

Description: JDBC DataSource Connection Pool Performance Impacts EJB Performance		
Cause		
CIT: JDBC Data Source	ETI: Data Source Connection Pool Performance	Value: Low
Symptom 1		
CIT: J2EE Application	ETI: EJB Performance	Value: Low
Symptom 2		
CIT: J2EE Server	ETI: EJB Performance	Value: Low

J2EE::JDBC Data Source:DataSource Connection Waiters >> DataSource Connection Pool Availability

Description: JDBC DataSource Connection Waiters Impacts DataSource Connection Pool Availability		
Cause		
CIT: JDBC Data Source	ETI: Data Source Connection Waiters	Value: High
Symptom 1		
CIT: J2EE Server	ETI: Data Source Connection Pool Availability	Value: Low
Symptom 2		
CIT: JDBC Data Source	ETI: Data Source Connection Pool Availability	Value: Low

J2EE::JDBC Data Source:DataSource ConnectionPool Utilization >> Transaction Capacity Utilization & JDBC Connection Pool Wait Count & Transaction Time & Transaction Commit Rate & Transaction Start Rate & DataSource Connection Pool Availability

Description: JDBC DataSource ConnectionPool Utilization Impacts Transaction Capacity Utilization and JDBC Connection Pool Wait Count and Transaction Time and Transaction Commit Rate and Transaction Start Rate and DataSource Connection Pool Availability		
Cause		
CIT: JDBC Data Source	ETI: Data Source Connection Pool Utilization	Value: High
Symptom 1		
CIT: J2EE Server	ETI: Data Source Connection Pool Availability	Value: Low
Symptom 2		
CIT: J2EE Server	ETI: JDBC Connection Pool Wait Count	Value: High
Symptom 3		
CIT: J2EE Server	ETI: Transaction Capacity Utilization	Value: High
Symptom 4		
CIT: J2EE Server	ETI: Transaction Commit Rate	Value: High
Symptom 5		
CIT: J2EE Server	ETI: Transaction Start Rate	Value: High

Description: JDBC DataSource ConnectionPool Utilization Impacts Transaction Capacity Utilization and JDBC Connection Pool Wait Count and Transaction Time and Transaction Commit Rate and Transaction Start Rate and DataSource Connection Pool Availability		
Symptom 6		
CIT: J2EE Server	ETI: Transaction Time	Value: High
Symptom 7		
CIT: JDBC Data Source	ETI: DataSource Connection Pool Availability	Value: Low
Symptom 8		
CIT: JDBC Data Source	ETI: JDBC Connection Pool Wait Count	Value: High

J2EE::JDBC Data Source:DataSource Leaked Connections Rate >> DataSource ConnectionPool Utilization

Description: JDBC DataSource Leaked Connections Rate Impacts DataSource ConnectionPool Utilization		
Cause		
CIT: JDBC Data Source	ETI: DataSource Leaked Connections Rate	Value: High
Symptom 1		
CIT: J2EE Server	ETI: DataSource ConnectionPool Utilization	Value: High
Symptom 2		
CIT: JDBC Data Source	ETI: DataSource ConnectionPool Utilization	Value: High

J2EE::JVM:All Processors Average Load >> CPU Load

Description: JVM All Processors Average Load Impacts CPU Load		
Cause		
CIT: JVM	ETI: All Processors Average Load	Value: High
Symptom 1		
CIT: Computer	ETI: CPU Load	Value: Overloaded

J2EE::JVM:JVM Memory Utilization >> Real User Transaction Performance & Real User Sessions Performance

Description: JVM Memory Utilization Impacts Real User Transaction Performance and Synthetic User Transaction Performance and Real User Sessions Performance		
Cause		
CIT: JVM	ETI: JVM Memory Utilization	Value: High
Symptom 1		
CIT: Business Application	ETI: Real User Sessions Performance	Value: Critical
Symptom 2		
CIT: Business Application	ETI: Real User Transaction Performance event	Value: Critical

J2EE::JVM:JVM Memory Utilization >> Synthetic User Transaction Performance

Description: JVM Memory Utilization Impacts Synthetic User Transaction Performance		
Cause		
CIT: JVM	ETI: JVM Memory Utilization	Value: High
Symptom 1		
CIT: Business Application	ETI: Synthetic User Transaction Performance event	Value: Critical

J2EE::JVM:JVM Memory Utilization >> Transaction Time & Transaction System Errors & Servlet Performance

Description: JVMMemoryUtilization Impacts Transaction Time and Transaction System Errors and Servlet Performance		
Cause		
CIT: JVM	ETI: JVM Memory Utilization	Value: High
Symptom 1		
CIT: J2EE Application	ETI: Servlet Performance	Value: Low
Symptom 2		
CIT: J2EE Server	ETI: Servlet Performance	Value: Low
Symptom 3		
CIT: J2EE Server	ETI: Transaction System Errors	Value: High
Symptom 4		
CIT: J2EE Server	ETI: Transaction Time	Value: High

J2EE::JVM:Total Garbage Collection Count >> CPU Load

Description: JVM Total Garbage Collection Count Impacts CPU Load		
Cause		
CIT: JVM	ETI: Total Garbage Collection Count	Value: High
Symptom 1		
CIT: Computer	ETI: CPU Load	Value: Overloaded

J2EE::JVM:Total Garbage Collection Time >> CPU Load

Description: JVM Total Garbage Collection Time Impacts CPU Load		
Cause		
CIT: JVM	ETI: Total Garbage Collection Time	Value: High
Symptom 1		
CIT: Computer	ETI: CPU Load	Value: Overloaded

J2EE::JVM:Total Number Of Threads >> CPU Load & Memory Usage Level

Description: JVM Total Number Of Threads Impacts CPU Load and Memory Usage Level		
Cause		
CIT: JVM	ETI: Total Number Of Threads	Value: High
Symptom 1		
CIT: Computer	ETI: CPU Load	Value: Constrained
Symptom 2		
CIT: Computer	ETI: Memory Usage Level	Value: Higher Than Normal

J2EE::Network Interface:Interface Communication Status >> Server Status

Description: Network Interface Communication Status Impacts Server Status		
Cause		
CIT: Interface	ETI: Interface Communication Status	Value: Unavailable
Symptom		
CIT: J2EE Server	ETI: Server Status	Value: Unavailable

J2EE::Network Interface:Interface Utilization >> Real User Transaction Performance & Real User Sessions Performance

Description: Network Interface Utilization Impacts Real User Transaction Performance and Real User Sessions Performance		
Cause		
CIT: Interface	ETI: Interface Utilization	Value: Higher Than Normal
Symptom 1		
CIT: Business Application	ETI: Real User Sessions Performance	Value: Critical
Symptom 2		
CIT: Business Transaction	ETI: Real User Transaction Performance event	Value: Critical

J2EE::Network Interface:Interface Utilization >> Servlet Performance

Description: Network Interface Utilization Impacts Servlet Performance		
Cause		
CIT: Interface	ETI: Interface Utilization	Value: Higher Than Normal
Symptom 1		
CIT: J2EE Application	ETI: Servlet Performance	Value: Low
Symptom 2		
CIT: J2EE Server	ETI: Servlet Performance	Value: Low

J2EE::Network Interface:Interface Utilization >> Synthetic User Transaction Performance

Description: Network Interface Utilization Impacts Synthetic User Transaction Performance		
Cause		
CIT: Interface	ETI: Interface Utilization	Value: Higher Than Normal
Symptom 1		
CIT: Business Application	ETI: Synthetic User Transaction Performance	Value: Critical

Event Type Indicators (ETIs)

ETIs categorizes events based on the type of occurrence. The OMi MP for IBM WebSphere Application Server includes the following ETIs to monitor WebSphere Application Server related

events:

How to Access ETIs

1. Open the Indicators pane:

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

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

2. Click **Configuration Item > Infrastructure Element > Application System > J2EE Domain.**

The following table lists the ETIs and policies that set the ETIs.

ETI/HI	Policy Name	Policy Description
Server Status	WebSphere_ServerStatus	The server status in terms of availability.
Thread Pool Utilization	WebSphere_CcrtThreadPlHngCt	The number of threads used in the server to execute tasks.
	WebSphere_ThreadPoolHungRt	
	WebSphere_ThreadPoolAveSize	
Server Sessions	WebSphere_ServSessAct Sess	The number of sessions opened to the server.
Servlets Loaded	WebSphere_WebAppServLoad	The number of servlets currently loaded for a web application.
Thread Pool Utilization	WebSphere_ThreadPoolUtilPct	The number of threads used in the server to execute the tasks.
Thread Hung Rate	WebSphere_ThreadPoolHungRt	The rate at which the threads are declared hung.
Transactions Rolled Back Rate	WebSphere_TranRollbackRt	Percentage of transactions rolled back due to system, resource or other errors.
Transaction Timeout Rate	WebSphere_TranTimeoutRte	The number of transactions that timed out per second.
Transaction Commit Rate	WebSphere_TranCommitRt	The number of transactions that were committed per second.
Transaction Start Rate	WebSphere_TranStartRt	The number of transactions that were begun per second.

ETI/HI	Policy Name	Policy Description
JVM Memory Utilization	WebSphere_JVMMemUtilPct	The percentage of heap size used.
Total Garbage Collection Count	WebSphere_GarbageCollectionCt	The number of times garbage collector has run.
Total Garbage Collection Time	WebSphere_ GarbageCollectionTime	Total time taken for garbage collection.
Total Number of Threads	WebSphere_ThreadStartedCt	Total number of threads spawned for garbage collection.
All Processors Average Load	WebSphere_ProcessCpuUsage	Average load on all the processors on the system.
Cluster Status	WebSphere_ClusterStatus	Cluster Status in terms of availability.
EJB Concurrent Lives	WebSphere_EJBConcLivesApp	The average number of bean objects in the pool.
EJB Performance	WebSphere_EJBMethRespTime	The performance statistics namely cache utilization.
EJB Utilization	WebSphere_EJBPoolUtilApp	The utilization of the EJB pool.
Servlet Performance	WebSphere_ WebAppServletRespTime	The performance statistics such as execution time.
Servlet Requests	WebSphere_ WebAppServReqRtApp	Number of incoming requests to the servlet.
Data Source Connection Waiters	WebSphereJDBCConnPoolWaiters	The average number of threads waiting for a connection from the connection pool.
Data Source Connection Pool Utilization	WebSphere_JDBCConnPoolUtil	DataSource connection pool utilization.

ETI/HI	Policy Name	Policy Description
Data Source Connection Pool Availability	WebSphere_ JDBCConnPoolWaitTime	Availability of JDBC connections in the connection pool.
Data Source Connection Pool Performance	WebSphere_ JDBCPreparedStDiscRt	DataSource connection pool performance.

Health Indicators (HIs)

HIs analyze the events that occur in the IBM WebSphere Application Servers and report the health of the WebSphere Application Server CIs.

How to Access HIs

1. Open the Indicators pane:

   On BSM 9.2x, click **Admin > Operations Management > Monitoring > Indicators**.

   On OMi 10.x, click **Administration > Service Health > CI Status Calculation > Event and Health Type Indicators**.

2. Click **Configuration Item > Infrastructure Element > Application System > J2EE Domain.**

The OMi MP for IBM WebSphere Application Server includes the following Health Indicators (HIs) to monitor the IBM WebSphere Application Server related events:

CI Type	HI	Description	Value
J2EE Server	Active Sockets Count	Number of HTTP socket connections opened to the server.	High, Normal
J2EE Server	Application Server Load	Load on the application server.	High, Normal
J2EE Server	Deferred Thread Requests	The number of requests that were denied a thread for execution because of the max-threads-constraint.	High, Normal
J2EE Server	HTTP Request Average Service Time	Average time required to service an HTTP request.	High, Normal

CI Type	HI	Description	Value
J2EE Server	HTTP Request Total Service Time	Total time required to service HTTP requests.	High, Normal
J2EE Server	HTTP Server Active Connections	Number of connections currently open.	High, Normal
J2EE Server	HTTP Server Active Request	Child servers currently in the request processing phase.	High, Normal
J2EE Server	HTTP Server Connection Time	Total time spent servicing HTTP connections.	High, Normal
J2EE Server	JMS Active Connection Count	Number of active JMS connections.	High, Normal
J2EE Server	JMS Server Utilization	JMS Server queue utilization.	High, Normal
J2EE Server	Oracle Web Cache Average Latency Current Interval	Average latency for 10 second intervals to process requests for Oracle Web Cache.	High, Normal
J2EE Server	Oracle Web Cache Latency Since Start	Average number of seconds to process requests for Oracle Web Cache since the application Web server started.	High, Normal
J2EE Server	Server Sessions	Number of sessions opened to this server.	High, Normal
J2EE Server	Server Status	Shows the server status in terms of availability.	Unavailable, Available
J2EE Server	Servlets Loaded	Number of servlets currently loaded for a web application (cumulative value per server).	High, Normal
J2EE Server	Thread Hung Rate	Rate at which the threads are declared hung.	High, Normal
J2EE Server	Thread Pool Availability	The availability of the threads in the Thread Pool.	Low, Normal
J2EE Server	Thread Pool Utilization	The number of threads used in the server to execute tasks.	High, Normal
J2EE Server	Thread Request Service Time	The time a request has to wait for a thread.	High, Normal
J2EE Server	Thread Request Wait Time	The time (in milliseconds) a request had to wait for a thread.	High, Normal
J2EE Server	Threads Request Pending	Requests that are pending because they are waiting for an available thread.	High, Normal

CI Type	HI	Description	Value
J2EE Server	Transaction Application Errors	Transaction errors due to application errors.	High, Normal
J2EE Server	Transaction Capacity Utilization	The number of simultaneous in-progress transactions.	High, Normal
J2EE Server	Transaction Commit Rate	The number of transactions that were committed per second.	High, Normal
J2EE Server	Transaction Resource Errors	Transaction errors caused due to system resource errors.	High, Normal
J2EE Server	Transaction Rollback Rate	The number of transactions rolled back due to system, resource, or others.	High, Normal
J2EE Server	Transaction Start Rate	The number of transactions that were begun per second.	High, Normal
J2EE Server	Transaction System Errors	Transaction errors caused due to system errors.	High, Normal
J2EE Server	Transaction Time	Time taken to complete a transaction.	High, Normal
J2EE Server	Transaction Timeout Errors	Transaction errors caused due to transaction timeout.	High, Normal
J2EE Server	Transaction Timeout Rate	The number of transactions that timed out per second.	High, Normal
J2EE Server	Transactions Rolled Back	Number/Percentage of transactions rolled back due to system, resource, or other errors.	High, Normal
J2EE Server	EJB Concurrent Lives	The average number of bean objects in the pool.	High, Normal
J2EE Server	EJB Utilization	The utilization of the EJB pool.	High, Normal
J2EE Server	Execute Queue Wait Count	The number of client requests waiting to be serviced by the execute queue.	High, Normal
J2EE Server	HTTP Sessions	Number of open HTTP sessions.	High, Normal
J2EE Server	EJB Missed Count Rate	Total number of times a failed attempt was made to get an instance from the free pool.	High, Normal
J2EE Server	EJB Free Pool Wait Rate	The number of times per minute no EJBs were available from the free pool.	High, Normal
J2EE	EJB Performance	The performance statistics such as cache	Low,

CI Type	HI	Description	Value
Server		utilization.	Normal
J2EE Server	EJB Timeout Rate	The number of times per minute a client timed out waiting for an EJB.	High, Normal
J2EE Server	EJB Transaction Rollback Rate	Number of EJB Transaction Rolled back in unit time.	High, Normal
J2EE Server	Servlet Performance	Performance statistics such as execution time.	Low, Normal
J2EE Server	Servlet Requests	Number of incoming requests to the servlet.	High, Normal
J2EE Server	Connections in Use	Number of currently used JDBC connections.	High, Normal
J2EE Server	JDBC Connection Pool Wait Count	Number of clients waiting for a JDBC connection.	High, Normal
J2EE Server	Data Source Connection Pool Availability	Availability of JDBC connections in the connection pool.	Low, Normal
J2EE Server	Data Source Connection Pool Failures	Number of failed attempts to refresh a connection in the connection pool.	Critical, Normal
J2EE Server	Data Source Connection Pool Utilization	Data source connection pool utilization	High, Normal
J2EE Server	Data Source Connection Pool Performance	Data source connection pool performance	Low, Normal
J2EE Server	Data Source Connection Waiters	The average number of threads waiting for a connection from the connection pool.	High, Normal
J2EE Server	JDBC Active Connection Count	Active JDBC connections	High, Normal
J2EE Server	Total Number of Threads	Total number of threads for garbage collection.	High, Normal
J2EE Server	Total Garbage Collection Count	Number of times garbage collector has run.	High, Normal
J2EE Server	Total Garbage Collection Time	Total time taken for garbage collection.	High, Normal

CI Type	HI	Description	Value
J2EE Server	JVM Memory Utilization	The percentage of heap size used.	High, Normal
J2EE Server	Heap Free Current	Amount of free heap available.	Low, Normal
J2EE Server	Heap Size Current	Amount of heap in use.	High, Normal
J2EE Server	All Processors Average Load	Average load on all the processors on the system.	High, Normal
J2EE Cluster	Cluster Health	Cluster health in terms of performance.	Poor, Normal
J2EE Cluster	Cluster Incoming Message Failure Rate	The number of multicast messages that were lost from the cluster.	High, Normal
J2EE Cluster	Cluster Outgoing Message Failure Rate	The number of multicast messages that were sent to the cluster.	High, Normal
J2EE Cluster	Cluster Status	Cluster Status in terms of availability.	Started, Partial Stopped, Stopped
JDBC Data Source	Connections in Use	Number of currently used JDBC connections.	High, Normal
JDBC Data Source	Data Source Connection Waiters	The average number of threads waiting for a connection from the connection pool.	High, Normal
JDBC Data Source	Data Source Connection Pool Availability	Availability of JDBC connections in the connection pool.	Low, Normal
JDBC Data Source	Data Source Connection Pool Failures	The number of failed attempts to refresh a connection in the connection pool.	Normal, Critical
JDBC Data Source	Data Source Connection Pool Performance	Data source connection pool performance.	Low, Normal
JDBC Data Source	Data Source Connection Pool Utilization	Data source connection pool utilization.	High, Normal

CI Type	HI	Description	Value
JDBC Data Source	Data Source Leaked Connections Rate	The rate of new leaked JDBC connections.	High, Normal
JDBC Data Source	JDBC Active Connections Count	Active JDBC connections	High, Normal
JDBC Data Source	JDBC Connection Pool Wait Count	The number of clients waiting for a JDBC connection.	High, Normal
J2EE Application	EJB Concurrent Lives	The average number of bean objects in the pool.	High, Normal
J2EE Application	EJB Free Pool Wait Rate	The number of times per minute no EJBs were available from the free pool.	High, Normal
J2EE Application	EJB Missed Count Rate	The total number of times a failed attempt was made to get an instance from the free pool.	High, Normal
J2EE Application	EJB Performance	The performance statistics such as cache utilization.	Low, Normal
J2EE Application	EJB Timeout Rate	The number of times per minute a client timed out waiting for an EJB.	High, Normal
J2EE Application	EJB Transaction Rollback Rate	Number of EJB transaction rolled back in unit time.	High, Normal
J2EE Application	EJB Transaction Throughput Rate	Number of EJBs Transactions completed in unit time.	High, Normal
J2EE Application	EJB Utilization	The utilization of the EJB pool.	High, Normal
J2EE Application	HTTP Sessions	Number of open HTTP sessions.	High, Normal
J2EE Application	Servlet Performance	The performance statistics such as execution time.	Low, Normal
J2EE Application	Servlet Requests	Number of incoming requests to the servlet.	High, Normal
JVM	All Processors Average Load	Average load on all the processors on the system.	High, Normal
JVM	Heap Free Current	Amount of free heap available.	Low, Normal

CI Type	HI	Description	Value
JVM	Heap Size Current	Amount of heap in use.	High, Normal
JVM	JVM Memory Utilization	The percentage of heap size used.	High, Normal
JVM	Total Garbage Collection Count	Number of times garbage collector has run.	High, Normal
JVM	Total Garbage Collection Time	Total time taken for garbage collection.	High, Normal
JVM	Total Number of Threads	Total number of threads for garbage collection.	High, Normal
J2EE Domain	Domain Status	The status of domain.	Normal, Poor

HI Assignments

OMi MP for IBM WebSphere Application Server includes the following HI Assignments.

HI Mapping	HI Assignment
J2EE Application	J2EE Application Mapping for HIs assignment
	J2EE Application Mapping for HIs assignment with empty monitor
J2EE Cluster	J2EE Cluster for HIs assignment
	J2EE Cluster for HIs assignment with empty monitor
J2EE Domain	J2EE Domain Mapping for HIs assignment
	J2EE Domain Mapping for HIs assignment with empty monitor
J2EE Server	J2EE Server Mapping for HIs assignment
	J2EE Server Mapping for HIs assignment with empty monitor
JDBC Data Source	JDBC Data Source Mapping for HIs assignment
	JDBC Data Source Mapping for HIs assignment with empty monitor
JVM	JVM Mapping for HIs assignment
	JVM Mapping for HIs assignment with empty monitor

Key Performance Indicators (KPIs) Assignments

OMi MP for IBM WebSphere Application Server includes the following KPI assignments.

CI Type	KPI Assignment
J2EE Application	J2EE Application Mapping for Service Health
	J2EE Application Mapping for SLM
J2EE Cluster	J2EE Cluster Mapping for Service Health
	J2EE Cluster Mapping for SLM
J2EE Domain	J2EE Domain Mapping for Service Health
	J2EE Domain Mapping for SLM
J2EE Server	J2EE Server Mapping for Service Health
	J2EE Server Mapping for SLM
JDBC Data Source	JDBC Data Source Mapping for Service Health
	JDBC Data Source Mapping for SLM
JVM	JVM Mapping for Service Health
	JVM Mapping for SLM

Operations Orchestration (OO) Flows

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 flows.

> **Note:** The OO flows shipped by OMi MP for IBM WebSphere Application Server can only be used in deployment scenarios where the application is monitored by Smart Plug-ins managed by an Operations Manager (OM) server. In such a case, the OO flows included in OMi MP for IBM WebSphere Application Server can be installed on an OO server and launched through the OMi-OO integration. For information about installing OO flows, see the *OMi MP for IBM WebSphere Application Server Installation Guide*. For more information about the OMi-OO integration, see the *OMi- Operations Orchestrations Integration Guide.*

Attribute	Description
omServerPort	Port number of the HPOM Tool Web Service (WS). This is an optional attribute.
omServerUser	User name for the HPOM Server that will use used in the HPOM Tool WS.
omServerPassword	Password for the HPOM Server that will use used in the HPOM Tool WS.

OMi MP for IBM WebSphere Application Server is packaged with the following OO flows:

Application Server Health Check

You can use this flow to check the health of an IBM WebSphere Application Server.

You can map this flow to the CIT **J2EEServer**.

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

Flow input	Description
omNode	Full Qualified Domain Name (FQDN) of the node. This must be a managed node for the HPOM Server and must be specified each time you run the OO flow.
jeeserver	Determines the type and the valid values are `wls/wbs`. You must specify this value each time you run the OO flow.
omServer	FQDN of the HPOM Server. You can map this input to the Event attribute **Originating Server**.
jeeserverName	Name of the J2EE Server.You can map this input to the CI attribute **J2eeserver_fullname** of CI Type **J2EEServer**.
timeout	Used when running the remote command on the node. This is an optional attribute and the default value is 100000.

Application Server Performance Check

You can use this flow to check the performance of an IBM WebSphere Application Server.

You must map this flow to the CIT **J2EEServer**.

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 HPOM Server and must be specified each time you run the OO flow.
jeeserver	Determines the type and the valid values are wls/wbs. You must specify this value each time you run the OO flow.
omServer	FQDN of the HPOM Server. You can map this input to the Event attribute **Originating Server**.

Flow input	Description
jeeserverName	Name of the J2EE Server.You can map this input to the CI attribute **J2eeserver_ fullname** of CI Type **J2EEServer**.
timeout	Used when running the remote command on the node. This is an optional attribute and the default value is 100000.

JDBC Health Check

You can use this flow to check the health of the JDBC Connection.

You must map this flow to the CIT **J2EEServer**.

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 HPOM Server and must be specified each time you run the OO flow.
jeeserver	Determines the type and the valid values are wls/wbs. You must specify this value each time you run the OO flow.
omServer	FQDN of the HPOM Server. You can map this input to the Event attribute **Originating Server**.
jeeserverName	Name of the J2EE Server. You can map this input to the CI attribute **J2eeserver_ fullname** of CI Type **J2EEServer**.
timeout	Used when running the remote command on the node. This is an optional attribute and the default value is 100000.

Tools

The OMi MP for IBM WebSphere Application Server is packaged with tools which enables administering, monitoring, and troubleshooting the WebSphere Application Server CIs. OMi MP for IBM WebSphere Application Server comprises the following tools:

How to Access Tools

On BSM 9.2x, click **Admin > Operations Management > Operations Console.**

On OMi 10.x, click **Administration > Operations Console > Tools.**

CI Type	Tool	Description
Computer	Restart WebSphere Monitoring	Restarts WebSphere monitoring on the managed server.

	Start WebSphere Monitoring	Starts WebSphere monitoring on the managed server.
	Stop WebSphere Monitoring	Stops WebSphere monitoring on the managed server.
	Data Capture Tool	Captures and archives MP logs and configuration data.

Graph Templates

OMi MP for IBM WebSphere Application Server is packaged with pre-defined graph templates to analyze the performance perspective of the IBM WebSphere Application Servers. The graph templates are mapped to the WebSphere CI type. The following section provides information about the graph family, graph templates and the metrics associated with the graph templates. It also provides information about accessing the graph templates and viewing the graphs.

How to Access Graph Templates

1. Open the graph templates:

   On BSM 9.2x, click **Admin > Operations Management > Operation Console**.

   On OMi 10.x, click **Administration > Operations Console > Performance Graph Mappings**.

2. In the CI Types pane, select **Infrastructure Element > Running Software > Application Server > J2EE Server > Websphere AS.**

Graph Family	Graph Templates	Metric Name	Metric Description
ThreadPool	ThreadPool	WEBSPHERE_PERCENTMAXED	Provides information about the percentage of time the number of threads in pool take to reach the configured maximum size.
		WEBSPHERE_CREATECOUNT	Provides information about the number of threads created per minute (used only for graphing).
		WEBSPHERE_ DECLAREDTHREADHUNGCOUNT	Provides information about

Graph Family	Graph Templates	Metric Name	Metric Description
			the number of threads hung per minute.
		WEBSPHERE_ CONCURRENTHUNGTHREADCOUNT	Provides information about the number of concurrent hung threads.
EJB	EJB Pool	WEBSPHERE_LIVECOUNT	Provides information about the average percentage of bean objects in the pool.
		WEBSPHERE_ RETRIEVEFROMPOOLSUCCESSCOUNT	Provides information about the average percentage of time a call to retrieve an EJB from the pool successfully.
		WEBSPHERE_ RETRIEVEFROMPOOLCOUNT	Provides information about the average percentage of time a call to retrieve an EJB from the pool failed.
	EJB Activity	WEBSPHERE_METHODCALLCOUNT	Provides information about the number of EJB method calls per minute.
		WEBSPHERE_STORECOUNT	Provides information about the number of times an EJB was written to or loaded from the database per minute.
		WEBSPHERE_ MESSAGEBACKOUTCOUNT	Provides information about

Graph Family	Graph Templates	Metric Name	Metric Description
			the message backout rate.
		WEBSPHERE_ RETURNSDISCARDCOUNT	Provides information about the returns discard rate.
	EJB Pool Size	WEBSPHERE_LIVECOUNT	Provides information about the average percentage of bean objects in the pool.
Servlet	Servlet Session Activity	WEBSPHERE_LIFETIME	Provides information about the average lifetime for a servlet session.
		WEBSPHERE_LIVECOUNT	Provides information about the active servlet sessions.
	Servlet Session Invalidations	WEBSPHERE_INVALIDATECOUNT	Provides information about the servlet invalidated session rate.
		WEBSPHERE_REQUESTCOUNT	Provides information about the number of request for a servlet per second.
		WEBSPHERE_ERRORCOUNT	Provides information about the number of errors in a servlet per second.
WebApplication	Web Application	WEBSPHERE_ LOADEDSERVLETCOUNT	Provides information about the web application servlet load.

Graph Family	Graph Templates	Metric Name	Metric Description
		WEBSPHERE_RELOADCOUNT	Provides information about the number of servlets reloaded for a web application per minute.
JDBC	JDBC Pool Waits	WEBSPHERE_WAITINGTHREADCOUNT	Provides information about the average percentage of threads waiting for a connection from connection pools.
		WEBSPHERE_WAITTIME	Provides information about the average time that a client waited for a connection in milliseconds.
	JDBC Pool Performance	WEBSPHERE_FAULTCOUNT	Provides information about the number of times a client timed out waiting for a connection from the pool per minute.
		WEBSPHERE_RETURNCOUNT	Provides information about the number of connections allocated and returned by applications per second.
	JDBC SQL Statistics	WEBSPHERE_ PREPSTMTCACHEDISCARDCOUNT	Provides information about the prepared statement discard rate.

Graph Family	Graph Templates	Metric Name	Metric Description
Transaction	Transaction Duration Times	WEBSPHERE_GLOBALTRANTIME	Provides information about the transaction global duration.
		WEBSPHERE_LOCALTRANTIME	Provides information about the transaction local duration.
		WEBSPHERE_GLOBALCOMMITTIME	Provides information about the transaction global commit duration.
		WEBSPHERE_LOCALCOMMITTIME	Provides information about the transaction local commit duration.
	Transaction Activity	WEBSPHERE_ROLLEDBACKCOUNT	Provides information about the transaction rollback rate.
		WEBSPHERE_GLOBALTIMEOUTCOUNT	Provides information about the number of global transactions completed.
		WEBSPHERE_LOCALTIMEOUTCOUNT	Provides information about the number of local transactions completed.
		WEBSPHERE_GLOBALCOMMITTIME	Provides information about the transaction commit rate.
		WEBSPHERE_ LOCALROLLEDBACKCOUNT	Provides information about the transaction rollback rate.

Graph Family	Graph Templates	Metric Name	Metric Description
		WEBSPHERE_GLOBALBEGUNCOUNT	Provides information about the number of global transactions that were completed per second.
		WEBSPHERE_LOCALBEGUNCOUNT	Provides information about the transaction start rate.
JVM Statistics	JVM Utilization	WEBSPHERE_USEDMEMORY	Provides information about theJVM memory utilization percent.
		WEBSPHERE_FREEMEMORY	Provides information about the JVM memory free percent.
		WEBSPHERE_PROCESSCPUUSAGE	Provides information about the JVM memory CPU usage percentage.
		WEBSPHERE_HEAPSIZE	Provides information about the Garbage collection value.

How to View Graphs

Performance Perspective enables you to populate graphs from existing graph templates. You can also plot customized graphs by selecting the required metrics for a selected CI.

To view the Performance Perspective of IBM WebSphere Application Server CIs using graphs, follow these steps:

1. Open the Performance Perspective pane:

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

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

The View Explorer pane appears.

2. In the **Browse Views** tab, select **WebSphere_Deployment_View**. The performance pane appears, which lists the default graphs available for the **WebSphere_Deployment_View**.
3. Click the graph you want to plot from the **Graphs** tab, and then click **Draw Graphs**. The selected graph is plotted on the right pane.

> **Note:** For more information about Managing Events, see the *Operations Manager i Concepts Guide*.

Chapter 4: Customization Scenarios

OMi MP for IBM WebSphere Application Server can be customized to suit your monitoring requirements. You can edit the existing WebSphere Management Templates or create new WebSphere Management Templates to monitor the IBM WebSphere Application Servers in your environment.

This section provides information about the following:

- Creating WebSphere Management Templates
- Editing WebSphere Management Templates

Creating WebSphere Management Templates

You can edit the existing WebSphere Management Templates or create new WebSphere Management Templates to monitor the IBM WebSphere Application Servers in your environment.

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 > Application Server Management > IBM WebSphere Management

3. Select the WebSphere 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 > Application Server Management > WebSphere Management > Test

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

7. In the **General** tab, type a **Name** for the new WebSphere Management Template. Click **Next**.
8. A WebSphere Management Template enables you to manage WebSphere CIs and all the related dependent CIs. Select **WebSphere_Deployment_View** from the list as the Topology View. The WebSphere_ Deployment _View shows the WebSphere CIs and all the related CITs.
9. Click an item in the topology map to select the **CI Type** of the CIs 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 J2EE Application to monitor WebSphere Application Server.
10. Click **Next**.
11. In the **Aspects** tab, add the Aspects to the Management Template. You must add the **WebSphere Base** Aspect to the new Management Template. The **WebSphere Base** Aspect contains the config file, open message interface, and scheduled task, and logfile policy templates, which are essential for data collection.

    To add an existing Aspect, follow these steps:

    a. Select the Aspect you want to add from the Available Aspects matching the CI Types pane. You can use CTRL or SHIFT key to select multiple Aspects.

    b. Click  to move the Aspect to the Selected Aspects pane. The Aspect is added to the Management Template.

    c. Click **Next**.
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  . 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 WebSphere Management Templates

The following section provides information about customizing Management Templates and Aspects.

Use Case 1: You are using Extensive WebSphere Management Template to monitor your J2EE environment. You do not want to use some Aspects which are included in the Extensive WebSphere Management Template.

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 > Application Server Management > IBM WebSphere Management > Management Templates > Extensive WebSphere Management Template

3. Select the **Extensive WebSphere Management Template** from the list, and then click . The Edit Management Template dialog box opens.
4. Click the **Aspects** tab. The list of Available Aspects matching the CI types and the list of Selected Aspects appear.

5. Select the Aspect that you do not want to use and click  . A message appears stating that the `Combined parameters based on parameters from the deleted objects will be changed, or removed if empty . Do you want to continue?`
6. Click **Yes**.
7. Click **OK**. The version of the Extensive WebSphere Management Template is incremented.

Use Case 2: You are using Websphere JVM Heap Memory Aspects to monitor the J2EE environment. You do not want to use some Policy Templates that are included in the WebSphere JVM Heap Memory Aspect.

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 > Application Server Management > IBM WebSphere Management > Aspects > WebSphere JVM Heap Memory
3. Select the **WebSphere JVM Heap Memory** from the list, and then click  . The Edit Management Template dialog box opens.
4. Click the **Policy Templates** tab. The list of Policy Templates appear.
5. Select the Policy Template that you do not want to use and click  . For example, you can select WebSphere_GCIntervalTime.
6. Click **OK**. The version of the WebSphere JVM Heap Memory Aspect is incremented.

Chapter 5: Deployment Scenarios

This section provides information about deploying OMi MP for IBM WebSphere Application Server on predominant configurations of IBM WebSphere Application Servers. OMi MP for IBM WebSphere Application Server can be used to monitor the following configurations:

- Network Deployment
- Cluster
- Secure configurations with LDAP and SSL authentication

WebSphere Application Servers in Network Deployment

To monitor WebSphere Application Servers in a Network Deployment configuration, follow these steps:

1. You must add the nodes you want to monitor to the BSM or OMi console. For more information about adding nodes, see Task 1: Adding Nodes to BSM or OMi Console.
2. To discover WebSphere CIs on each managed nodes in the network deployment configuration, you can deploy the WebSphere Discovery Aspect. For more information about deploying the discovery Aspects from the OMi console, see Task 3: Deploying the WebSphere Discovery Aspect.
3. To monitor the managed nodes in the network deployment configuration, you can deploy the "Extensive WebSphere Management Template" on each domain CI in the network deployment configuration. For more information about deploying the Management Templates, see Task 5: Deploying the WebSphere Management Templates or WebSphere Aspects.

WebSphere Application Servers in Cluster Environment

To deploy OMi MP for IBM WebSphere Application Server in a WebSphere cluster environment, follow these steps:

1. You must add the nodes you want to monitor to the BSM or OMi console. For more information about adding nodes to the BSM console, see Task 1: Adding Nodes to BSM or OMi Console.
2. To discover WebSphere CIs on each managed nodes in the cluster, you can deploy the WebSphere Discovery Aspect. For more information about deploying the discovery Aspects, see Task 3: Deploying the WebSphere Discovery Aspect.
3. To monitor the managed nodes in the cluster, you can deploy the "Extensive WebSphere Management Template" on each domain CI in the cluster. For more information about deploying the Management Templates, see Task 5: Deploying the WebSphere Management Templates or WebSphere Aspects.

WebSphere Application Servers Using LDAP and SSL Authentication Providers

WebSphere Application Servers can be configured using authentication providers like Secure Sockets Layer (SSL) and Lightweight Directory Access Protocol (LDAP) to provide a secure and stable server environment. To deploy OMi MP for IBM WebSphere Application Server on WebSphere Application Servers using SSL and LDAP authentication, follow these steps:

1. You must add the nodes you want to monitor to the BSM or OMi console. For more information about adding nodes to the BSM console, see Task 1: Adding Nodes to BSM or OMi Console.
2. To discover the WebSphere Application Server CIs, you can deploy the WebSphere Discovery Aspect to discover WebSphere Application Server CIs on the managed nodes:
   a. Open the Management Templates & Aspects pane:

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

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

   b. In the Configuration Folders pane:

      Configuration Folders > Application Server Management > IBM WebSphere Management > Aspects

   c. In the WebSphere Aspects folder, click the **WebSphere Discovery** Aspect, and then click  to open the Assign and Deploy Wizard.

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

The **Required Parameters** tab opens.

e. In the **Required Parameters** tab, you must specify the mandatory parameter **WebSphere Profile Home** and dependent parameters.

> **Note:** For every WebSphere Server Home parameter, you must configure the dependent parameters WebSphere JAVA Home, WebSphere Username, and WebSphere Password.

i. Select the **WebSphere Server Home** parameter in the list, and then click  . The Edit Instance Parameter: WebSphere Server Home dialog box opens.

ii. Specify values for the dependent parameters:

A. Select the **WebSphere Username** parameter in the list, and then click  . The Edit Parameter: WebSphere Username dialog box opens.

B. Click **Value**, specify your LDAP username depending on the type of authentication, and then click **OK**.

C. Select the **WebSphere Password** parameter in the list, and then click  . The Edit Parameter: WebSphere Password dialog box opens.

D. Click **Value**, specify your LDAP password depending on the type of authentication, and then click **OK**.

iii. For WebSphere Application Servers using SSL authentication:

A. Select the **WebSphere KeyStore Path** parameter in the list, and then click  . The Edit Parameter: WebSphere KeyStore Path dialog box opens.

B. Click **Value**, specify the path to WebSphere KeyStore, and then click **OK**.

C. Select the **WebSphere Passphrase Password** parameter in the list, and then click .  The Edit Parameter: WebSphere Passphrase Password dialog box opens.

D. Click **Value**, specify the WebSphere Passphrase password, and then click **OK**.

E. Click **OK**.

f. Click **Next** to go to **All Parameters** and **Parameter Summary**. To change the default values of the parameters, you can select the parameter and then click  . The Edit Parameter dialog box opens. Click **Value**, specify the value, and then click **OK**.

> **Note:** In the **Parameter Summary** tab, you can override the default values of any parameter. You can specify a value for each parameter at the Aspect level. By default, parameters defined as expert parameters are not shown. To show expert parameters, click **Show Expert Parameters.**

g. Click **Next**.

h. *(Optional)*. If you do not want to enable the assignment immediately, clear the **Enable Assigned Objects or Enable Assignment(s)** check box. You can then enable the assignment later using the Assignments & Tuning pane.

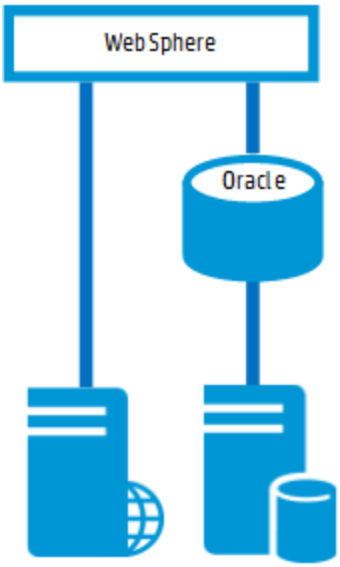
i. Click **Finish**.

3. To monitor the managed nodes in the cluster, you must deploy the "Extensive WebSphere Management Template" on each domain CI. For more information about deploying the Management Templates, see Task 5: Deploying the WebSphere Management Templates or WebSphere Aspects.

Chapter 6: Composite Applications

This section provides information about monitoring an environment comprising composite applications - IBM WebSphere Application Servers, Oracle databases, and the underlying infrastructure.

Consider an enterprise environment topology for an instance of composite application that consists of systems that are hosting WebSphere Application Server and Oracle database.



Monitoring Composite Applications

To monitor an instance of a composite application, follow these tasks:

Task 1: Adding Nodes to OMi Console

Before you monitor an instance of composite application, you must ensure that the Operations Agent is installed on all the nodes and add the nodes to the OMi console.

> **Note:** If the Node already exists in RTSM, you can skip this step and proceed to Task 2.

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

1. Open the Monitored Nodes pane from Administration:

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

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

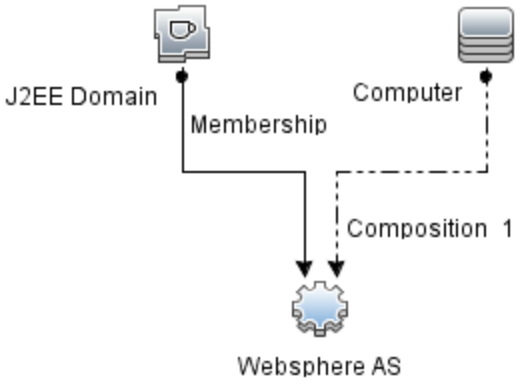
2. In the Node Views pane, click **Predefined Node Filter > Monitored Nodes** and then click  and then select **Computer > Windows** or **Unix**. The Create New Monitored Nodes dialog box appears.
3. Specify the Primary DNS Name, IP Address, Operating System, and Processor Architecture of the node and click **OK**.

Task 2: Deploying WebSphere Discovery Aspect

The WebSphere Discovery Aspect enables you to discover IBM WebSphere Application Server instances in the environment. To discover the IBM WebSphere Application Server CIs on the added managed nodes, you must deploy the WebSphere Discovery Aspect to a Computer CI.

The WebSphere Discovery Aspect deployment discovers the Configuration Item (CIs) of the following CI types (CITs):

- j2eedomain
- websphereas



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 > Application Server Management > IBM WebSphere Management > Aspects

3. In the Aspects folder, click **WebSphere Discovery** Aspect, and then click  to open the Assign and Deploy Wizard.

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

   The **Required Parameters** tab opens and a message appears stating that there are no parameters that require editing for this Assignment.

5. In the **Required Parameters** tab, click **Next** to go to the **All Parameters** tab on BSM 9.2x or **Parameter Summary** tab on OMi 10.x.

6. *(Optional)*. In the **All Parameters** tab on BSM 9.2x or **Parameter Summary** tab on OMi 10.x, to change the default value of the Frequency of WebSphere_MPlog parameter, you can select the parameter and then click  . The Edit Parameter dialog box opens. Click **Value**, specify the value, and then click **OK**.

7. In the **All Parameters** tab on BSM 9.2x or **Parameter Summary** tab on OMi 10.x, click **Next** to go to the **Configure Option** tab.

8. *(Optional)*. In the **Configure Option** tab, if you do not want to enable the assignment immediately, clear the **Enable Assigned Objects** check box on BSM 9.2x or **Enable Assignment(s)** check box on OMi 10.x. You can then enable the assignment later using the Assignments & Tuning pane.

9. Click **Finish**.

Task 3: Verifying Discovery

After you deploy the WebSphere Discovery Aspect, you can verify if the CIs are populated in the View Explorer.

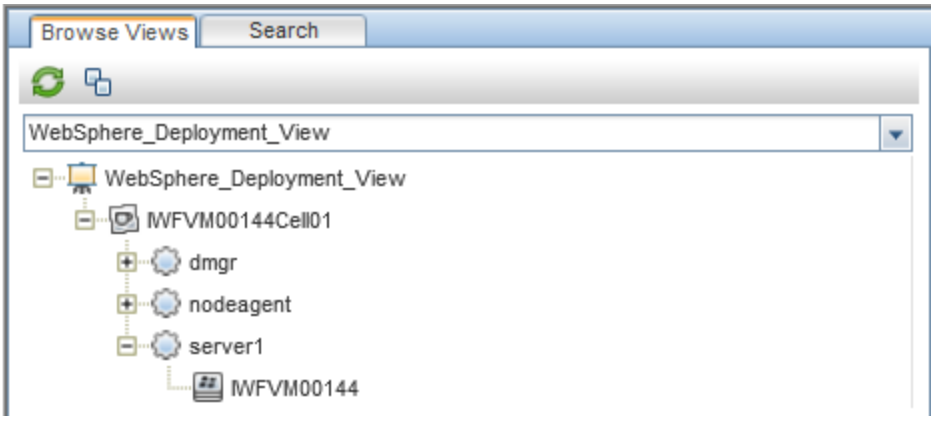
To view the CIs populated in the View Explorer, follow these steps:

1. Open the Event Perspective pane:

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

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

   In the View Explorer, select **WebSphere_Deployment_View** from the drop-down list. You can see the CIs associated with the **WebSphere_Deployment_View** as shown in the following figure.

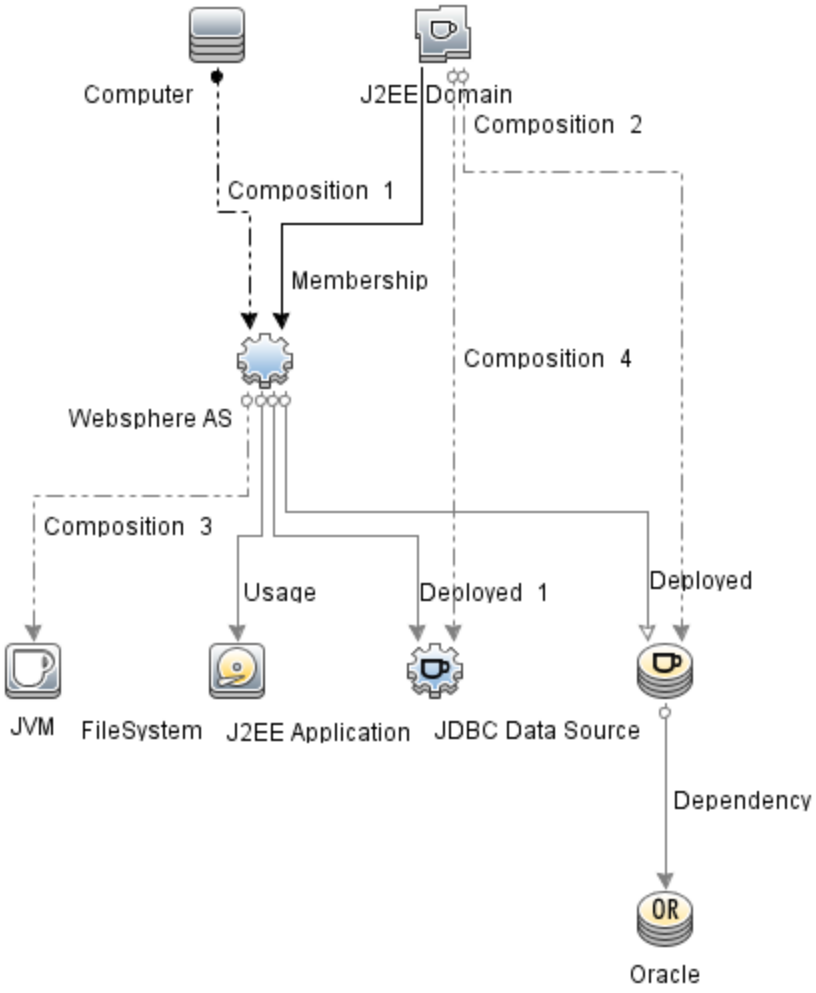


Task 4: Deploying Extensive WebSphere and Oracle Database Management Template

Before deploying the WebSphere Management Templates, you must deploy the WebSphere Discovery Aspect. For more information, see Task 3: Deploying WebSphere Discovery Aspect.

The WebSphere Management Template discovers the CIs of the following CITs and completes the topology as shown in the following figure:

- JVM
- Application Servers
- JDBC and underlying databases
- Oracle



To deploy the Extensive WebSphere and Oracle Database Management Template, 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 > Application Server Management > IBM WebSphere Management > Management Templates > Extensive WebSphere and Oracle Database Management Template

3. In the WebSphere Management Templates folder, click the Extensive WebSphere and Oracle Database Management Template, and then click  . The Assign and Deploy wizard opens.
4. In the **Configuration Item** tab, click the WebSphere Domain CI to which you want to assign the Management Template, and then click **Next**. You can select multiple items by holding down the **CTRL** or **SHIFT** key while selecting them. Click **Next** to accept the CIs and go to **Required Parameters**.
5. In the **Required Parameters** tab, you can specify the values of all the parameters that are listed (Server profile home, Username, and Password). To specify the values of the parameters, you can select the parameter and then click  . The Edit Parameter dialog box opens. Click **Value**, specify the value, and then click **OK**.

   > **Note:** You must specify all the values of the parameters to be able to continue the configuration process.

6. Click **Next** to go to **All Parameters** tab on BSM 9.2x or **Parameter Summary** tab on OMi 10.x.
7. 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**.
8. *(Optional)*. If you do not want to enable the assignment immediately, clear the **Enable Assigned Objects** on BSM 9.2x or **Enable Assignment(s)** check box on OMi 10.x. You can then enable the assignment later using the Assignments & Tuning pane.
9. Click **Finish**.

   > **Note:** The credentials given during the deployment of a Management Template should have required privileges for OMi MP for IBM WebSphere Application Server to collect data.

Task 5: Verifying Discovery for Extended Topology

After you deploy the WebSphere Management Templates or WebSphere Base Aspect, you can verify if the CIs are populated in the View Explorer.

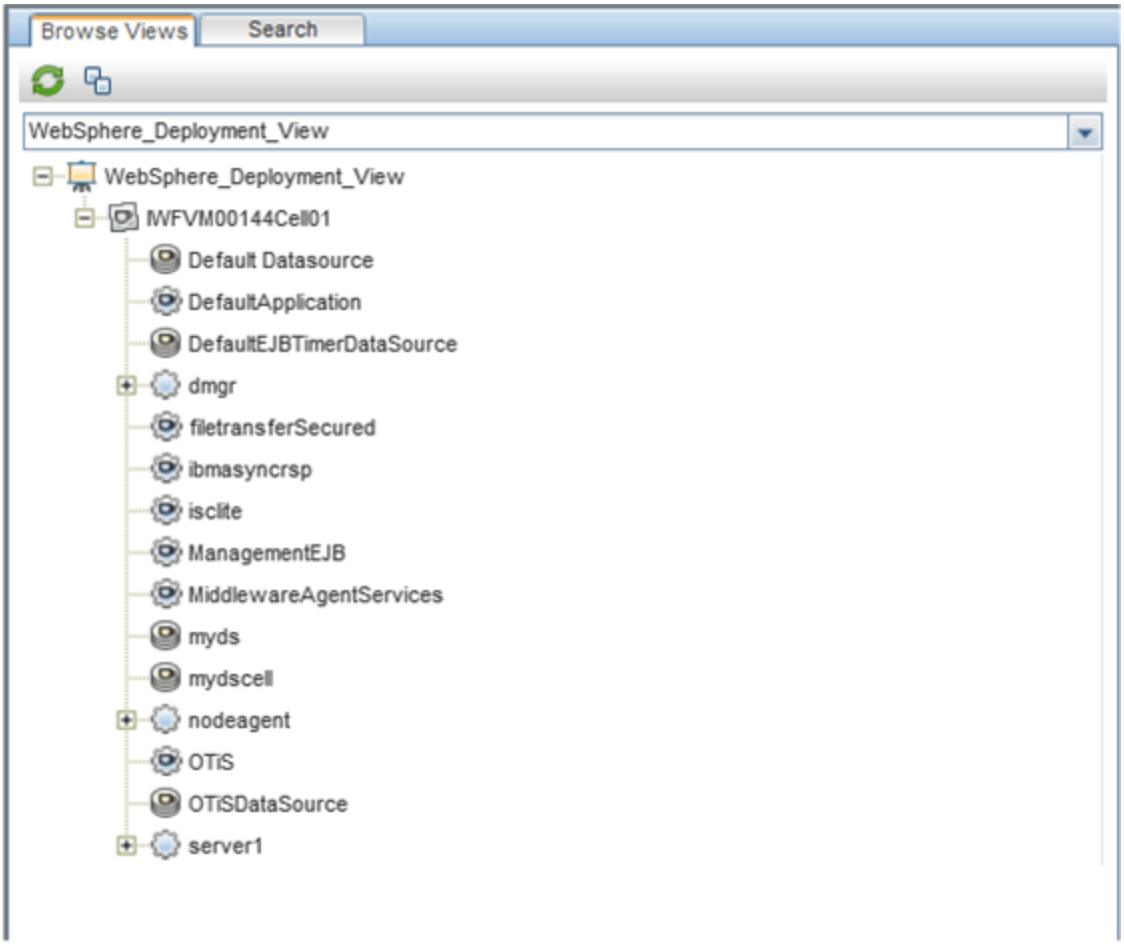
To view the CIs in the View Explorer, follow these steps:

1. Open the View Explorer 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 **WebSphere_Deployment_View** from the drop-down list. You can see the extended topology comprising CIs associated with the **WebSphere_Deployment_View** as shown in the following figure.



Chapter 7: Troubleshooting

The following section provides information about troubleshooting scenarios. Some of the troubleshooting procedures must be run on the managed node.

Licensing count is not updated

Problem: Licensing count is not updated on License Management

Solution: To resolve this problem, follow these steps on the OMi Linux or Windows servers:

1. After installing OMi MP for IBM WebSphere Application Server, ensure that the license is activated by following these steps:
   a. Open the License Management pane:

      On BSM 9.2x, click **Admin > Platform > Setup and Maintenance > License Management**.

      On OMi 10.x, click **Administration > Setup and Maintenance > License Management**.

   b. Click  and select the `license.dat` file. The license details appears in the License Management window.

      The License Management provides details about the name, license type, days left, expiration date, capacity, and capacity details.
2. To check for the license usage on the managed node, run the following command on the managed node:

   ```
   <OvAgentDir>/bin/ovodetect -t
   ```

   If the output of the preceding command is mpinstance="1", then IBM WebSphere Application Servers are being monitored. If the output of the preceding command is mpinstance="0", then IBM WebSphere Application Servers are not being monitored.
3. If the license is still not updated in License Management, restart agent on the managed node by running the following command:

   ```
   <OvAgentDir>/bin/ovc- restart opcmsga
   ```

Management Templates and Aspects are not deployed to the managed nodes

Problem: Management Templates and Aspects are not deployed to the managed nodes

Solution: To resolve this problem, follow these steps on the OMi Linux or Windows servers:

1. To check the deployment status, open the Deployment Jobs pane:

   On BSM 9.2x, click **Admin > Operations Management > Monitoring > Deployment Jobs**.

   On OMi 10.x, click **Administration > Monitoring > Deployment Jobs**.

2. To check the assignment status, open the Assignment & Tuning pane:

   On BSM 9.2x, click **Admin > Operations Management > Monitoring > Assignments & Tuning**.

   On OMi 10.x, click **Administration > Monitoring > Assignments & Tuning**.

3. Check the OMi log files at the following locations:

   Linux:

   `/opt/HP/BSM/log/EJBContainer/opr-webapp.log`

   `/opt/HP/BSM/log/EJBContainer/opr-configserver.log`

   Windows:

   `%topaz_home%\log\EJBContainer\opr-webapp.log`

   `%topaz_home%\log\EJBContainer\opr-configserver.log`

OMi MP for IBM WebSphere Application Server displays errors during installation

Problem: Installation of OMi MP for IBM WebSphere Application Server returns errors.

Solution: You can identify specific errors by checking the `mpinstall.log` log file.

The `mpinstall.log` log file is available at the following locations:

Windows:

`%TOPAZ_HOME%\log\mpinstall.log`

UNIX:

`$TOPAZ_HOME/log/mpinstall.log`

Error during upload of OMi MP for IBM WebSphere Application Server

Problem: OMi MP for IBM WebSphere Application Server returns error during upload.

Solution: You can identify specific errors by checking the `opr-configserver.log` log file.

The `opr-configserver.log` log file is available at the following locations:

Windows:

```
%TOPAZ_HOME%\log\EJBContainer\opr-configserver.log
```

UNIX:

```
$TOPAZ_HOME/log/EJBContainer/opr-configserver.log
```

Views not getting populated after deployment of the WebSphere Discovery Aspect

Problem: Views for OMi MP for IBM WebSphere Application Server are not getting populated after deployment of the WebSphere Discovery Aspect.

Solution: You can identify specific errors by following these steps:

1. Open the WebSphere Instrumentation folder:

   Windows:

   `%OVADATADIR%\bin\instrumentation`

   UNIX:

   `/var/opt/OV/bin/instrumentation`

2. In the Instrumentation folder, look for the following file:

   `bin/instrumentation/WebSphere_Discovery_Log4j.properties`

3. Open WebSphere_Discovery_Log4j.properties file.

4. Select `log4j.appender.FILE.Threshold` and modify to `log4j.appender.FILE.Threshold=trace`.

   Tracing is enabled for WebSphere Discovery. `WebSphereDiscovery.log` log file is created.

5. Check the `WebSphereDiscovery.log` log file for specific errors.

   The `WebSphereDiscovery.log` log file is available at the following locations.

   Windows:

   `%OVDATADIR%\log\WebSphere\`

   UNIX:

   `/var/opt/OV/log/WebSphere/`

Error during deployment of the WebSphere Discovery Aspect

Problem: During deployment of WebSphere Discovery Aspect, an error message appears stating that the connection could not be established.

Solution: To resolve this problem, follow these steps:

1. Check if the credentials entered during deployment have required access permissions to WebSphere Application Server.
2. Configure WebSphere Keystore and Passphrase if the WebSphere Application Server uses SSL Authentication Providers.

Collection Manager not getting invoked

Problem: Collection manager for OMi MP for IBM WebSphere Application Server is not getting invoked for data collection.

Solution: To resolve this problem, follow these steps:

1. Open the IBM WebSphere Application Server Instrumentation folder:

   Windows:

   `%ovdatadir%\bin\instrumentation`

   UNIX:

   `/var/opt/OV/bin/instrumentation`

2. In the Instrumentation folder, look for the following file:

   `bin/instrumentation/WebSphere_cmlog4j.properties`

3. Open `WebSphere_cmlog4j.properties` file.
4. Select `log4j.appender.FILE.Threshold` and modify to `log4j.appender.FILE.Threshold=trace`.

   Tracing is enabled for WebSphere Collection Manager.

5. Check the `Collector.log` and `CollectionManager.log` log file for specific errors.

   The `Collector.log` log file is available at the following locations.

   Windows:

   `%OVDATADIR%\log\WebSphere`

   UNIX:

   `/var/opt/OV/log/WebSphere`

   The `CollectionManager.log` log file is available at the following locations.

   Windows:

   `%OVDATADIR%\log\WebSphere\collectionManager`

UNIX:

`/var/opt/OV/log/WebSphere/collectionManager`

No data for Performance Manager i (PMi) Graphs

Problem: The information to create PMi graph is not available from the OMi MP for IBM WebSphere Application Server.

Solution: To resolve this problem, follow these steps:

1. Run the following command to check if the graph data sources are created:

   `ovcodautil –obj WebSphere_DATA`

2. Run the following command to check data dumps of WebSphere_DATA data source:

   `ovcodautil –dumpds WebSphere_DATA`

   If there are empty instances, perform step 3 and 4.

3. From the `WebSphere_cmlog4j.properties` file, select `log4j.appender.FILE.Threshold` and modify to `log4j.appender.FILE.Threshold=trace`.

   Tracing is enabled for WebSphere Collection Manager.

4. Check the `Collector.log` and `CollectionManager.log` log file for specific errors.

   The `Collector.log` log file is available at the following locations.

   Windows:

   `%OVDATADIR%\log\WebSphere`

   UNIX:

   `/var/opt/OV/log/WebSphere`

   The `CollectionManager.log` log file is available at the following locations.

   Windows:

   `%OVDATADIR%\log\WebSphere\collectionManager`

   UNIX:

   `/var/opt/OV/log/WebSphere/collectionManager`

Unable to access lib folder

Problem: Non-root users are unable to access `lib` folder.

Solution: For non-root users, provide the read access to IBM WebSphere Application Server `lib` folder in the installation path.

Data logging for metric may show values as -1

Problem: Data logging for few metric may shows values of -1 for one of the following reasons:

- If the WebSphere MP installation prerequisites are not met for the managed node. The Performance Monitoring Infrastructure (PMI) instrumentation category should be set to all and the ConfigProxy MBean needs to be enabled.
- If the WebSphere runtime Mbean returns null values for raw metrics.
- If the calculated metric has operands as raw metrics which have null values.
- Delta and rate of change metrics will result in -1 values for the very first scheduled collection. This is expected behaviour.

Solution: To know more details about the cause of -1 errors, Check the Installation Prerequisites. For more information, see the section Setting the PMI Counters in the *OMi MP for IBM WebSphere Application Server Installation Guide*. If the prerequisites are already met, follow these steps:

1. To view the data logged for metrics, run the following command:

   ```
   ovcodautil -dumpds WEBSPHERE_DATA
   ```

2. Identify the metric name and check for the metric which contains value logged as -1 in the CODA dump.
3. Determine the metric ID using the `WebSphere_MetricDefinition.xml` available at the following location:

   ```
   %ovdatadir%/bin/instrumentation
   ```

4. Verify collector logs on the managed node and check for the collection ID that is showing exceptions with null value return message in the `collector.log` file available at the following location:

   `%ovdatadir%/log/WebSphere`.

   The message provides exact details about which MBean query failed and which returned a null value for the metric.

Appendix: Metrics and Data Sources

The following table lists the table names and related metrics for OMi MP for IBM WebSphere Application Server:

> **Note:** WEBSPHERE_DATA is the data source used by OMi MP for IBM WebSphere Application Server for logging collected data.

Aspect Name	Table Name or Class Name	Policy Name	Collection Name	Metric Name	Data Type
WebSphere_ ServerStatus	WebSphere_Server	WebSphere_ ServerStatus	WebSphere_C0001	Server Status	UTF8
		WebSphere_ ProcessCpuUsage	WebSphere_C0801	CPUUsagePerct	
WebSphere Thread Status	WebSphere_Thread	WebSphere_ ThreadStartedCt	WebSphere_C0803	ThreadsCount_D	UTF8
		WebSphere_ ThreadPoolHungRt	WebSphere_C0812	ThreadPoolHungRt	
		WebSphere_ GarbageCollectionCt	WebSphere_C0804	GCCalls_D	
		WebSphere_ ThreadPoolUtilPct	WebSphere_C0212	ThreadPoolUtilPct	
		WebSphere_ ThreadPoolPctMaxApp	WebSphere_C0213	ThreadPoolPctMaxApp	
WebSphere JVM Heap Memory	WebSphere_JVM_ Perf	WebSphere_ GarbageCollectionTime	WebSphere_C0805	GCAvgCallDur_D	REAL 64
		WebSphere_ JVMMemUtilPct	WebSphere_C0005	UsdHeapSz_P	
WebSphere Cluster Status	WebSphere_Cluster	WebSphere_ ClusterStatus	WebSphere_C0006	ClusterStatus	REAL 64
WebSphere EJB Performan	WebSphere_EJB	WebSphere_ EJBPoolUtil	WebSphere_C0020	EJBPoolUtil	REAL 64

Aspect Name	Table Name or Class Name	Policy Name	Collection Name	Metric Name	Data Type
ce					
		WebSphere_ EJBPoolUtilApp	WebSphere_C0220	EJBPoolUtil	
		WebSphere_ EJBConcLivesApp	WebSphere_C0226	EJBMsgBackoutRate	
		WebSphere_ EJBMethRespTime	WebSphere_C0221	EJBMethRespTime	
		WebSphere_ EJBMethCallsRtApp	WebSphere_C0222	EJBMethCallsRtApp	
		WebSphere_ EJBEntDatLdStRtApp	WebSphere_C0224	EJBEntDatLdStRtApp	
		WebSphere_ EJBMsgBackoutRate	WebSphere_C0810	EJBMsgBackoutRate	
		WebSphere_ EJBReturnDiscrdRt	WebSphere_C0811	EJBReturnDiscrdRt	
WebSphere Servlet Performance	WebSphere_Servlet	WebSphere_ ServSessAveLife	WebSphere_C0040	ServSessAveLife	REAL 64
		WebSphere_ ServSessActSess	WebSphere_C0041	ServSessAct	
		WebSphere_ ServInvSessRt	WebSphere_C0042	ServInvSessRt	
		WebSphere_ WebAppServReqRtApp	WebSphere_C0245	WebAppServReqRtApp	
		WebSphere_ WebAppServletRespTime	WebSphere_C0246	WebAppSrvltRespTime	
		WebSphere_ WebAppServErrRtApp	WebSphere_C0247	WebAppSrvltErrorRt	
		WebSphere_ WebAppServLoad	WebSphere_C0048	WebAppServLoad	
WebSphere JDBC Connection Pool	WebSphere_JDBC	WebSphere_ JDBCConnPoolSize	WebSphere_C0260	JDBCConnPoolSize	REAL 64

Aspect Name	Table Name or Class Name	Policy Name	Collection Name	Metric Name	Data Type
Status					
		WebSphere_ JDBCConnPoolWaiters	WebSphere_C0261	JDBCConnPoolWaiters	
		WebSphere_ JDBCConnPoolWaitTime	WebSphere_C0262	JDBCConPoolWaitTime	
		WebSphere_ JDBCConnPoolUtil	WebSphere_C0263	JDBCConnPoolUtil	
		WebSphere_ JDBCConnPoolMaxPct	WebSphere_C0264	JDBCConnPoolMaxPct	
		WebSphere_ JDBCConnPoolTimeOutRts	WebSphere_C0265	JDBCConPoolTmeOutRt	
		WebSphere_ JDBCConPoolThroughput	WebSphere_C0266	JDBCConPoolThruput	
		WebSphere_ JDBCPreparedStDiscRt	WebSphere_C0814	JDBCPrepredStDiscRt	
WebSphere Transaction Status	WebSphere_Transact	WebSphere_ TranGlobDur	WebSphere_C0070	TranGlobDur	REAL 64
		WebSphere_TranLocDur	WebSphere_C0071	TranLocDur	
		WebSphere_ TranGlobCommDur	WebSphere_C0072	TranGlobCommDur	
		WebSphere_ TranLocCommDur	WebSphere_C0073	TranLocCommitDur	
		WebSphere_ TranRollbackRt	WebSphere_C0074	TranRollbackRt	
		WebSphere_ TranTimeoutRte	WebSphere_C0075	TranTimeoutRt	
		WebSphere_ TranCommitRt	WebSphere_C0076	TranCommitRt	
		WebSphere_TranStartRt	WebSphere_C0078	TranStartRt	

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