

Oracle® Enterprise Manager

System Monitoring Plug-in Installation Guide for Apache Tomcat

Release 12 (1.0.3.1.0) and Release 6 (1.0.3.0.0)

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This document is the installation guide for the System Monitoring Plug-In for Non-Oracle Middleware for Apache Tomcat. You can find the following information in this document:

- A brief description of the System Monitoring Plug-In for Non-Oracle Middleware for Apache Tomcat
- Apache Tomcat versions and Enterprise Manager versions that the plug-in supports
- Prerequisites for installing the plug-in
- Step-by-step instructions to download, install, upgrade, and undeploy the plug-in
- Instructions to add Apache Tomcat application servers for monitoring

Description

Apache Tomcat is an open source application server that implements the Java Servlet and Java Server Pages (JSP) specifications, providing an environment for Java code to run in. The System Monitoring Plug-In for Non-Oracle Middleware for Apache Tomcat extends Oracle Enterprise Manager Grid Control (Grid Control) to add support for managing it.

Management Features

By deploying the plug-in within your Grid Control environment, you can use management features, such as availability and performance metrics, reports, and alerts.

Metrics

Metrics are units of measurement used to determine the health of a target. To find a complete list of all the metrics for a target, click **All Metrics** in the *Related Links* section of the target home page. From the All Metrics page, you can view all the metric categories for the target and then drill down to any particular metric for additional information.

After adding the target to Enterprise Manager, you can then customize the monitoring configuration of the target; for instance, you can modify metric threshold values, change metric collection schedules, and disable collection for some metrics.

To view a list of metrics captured for this target, see *Enterprise Manager System Monitoring Plug-In Metric Reference Manual for Non-Oracle Middleware Management*. The document can be found at the following location:

<http://www.oracle.com/technetwork/oem/grid-control/documentation/index.html>

Reports

Several predefined, performance-based reports are provided for Apache Tomcat. Such reports include:

- Apache Tomcat Load - Charts of total load on all global request processors
- All Applications Load- Applications load charts at server level
- Apache Tomcat Thread Pools- Thread pools active threads and total thread charts
- Datasources- Datasources active connections and idle connections charts
- Global Request Processors Load And Performance- Global request processor load and performance charts
- Memory Utilization- Resource utilization charts
- Top 10 Applications Based On Total Sessions- Top 10 applications based on sessions created during the last 24 hours
- Top 10 Servlets Based On Total Requests- Top 10 servlets by number of requests on each servlet during the last 24 hours

Additionally, custom reports can also be generated based on data stored in the Management Repository.

Alerts

You can configure Enterprise Manager to send alerts notifying you of problems with the target. To receive alerts on the console, specify warning and/or critical threshold levels for those metrics of importance to you.

To edit a threshold:

1. Choose **Metric and Policy Settings** on any target home page.
2. From the Metric Thresholds page, you can either modify warning and/or critical thresholds directly from the table.

Alternatively, click the **Edit** icon (pencil) to access the Edit Advanced Settings page.

An alert is triggered when one of the following conditions is true:

- A metric threshold is reached
- The availability of a monitored service changes
- A metric-specific condition occurs

Other Management Features

Enterprise Manager allows you to monitor the response time data generated by actual end-users as they access and navigate your Web site. You can gather

end-user performance data and monitor the performance of the pages within your Web application.

Web servers, such as OracleAS Web Cache, Oracle HTTP Server, and Apache HTTP Server collect the end-user performance data and store it in the log file. Enterprise Manager processes this data and uploads it to the Management Repository. You can then view and analyze this data within the Grid Control Console.

Versions Supported

This plug-in supports the following versions of products:

- The following releases of Oracle Management Service and Oracle Management Agent:
Enterprise Manager 11g Grid Control Release 1 (11.1.0.1) or higher (*Oracle Management Service and Oracle Management Agent*)
OR
Enterprise Manager 10g Grid Control Release 2 (10.2.0.1) or higher, and Oracle Management Agent 10g Release 2 (10.2.0.3) or higher.
- Apache Tomcat 6.0.x, 5.5.x, 5.0.3 through 5.0.30.

Prerequisites

The following prerequisites must be met before you can deploy the plug-in:

- Apache Tomcat is installed.
- Apache Tomcat is running on JDK 1.5. Therefore, remote JMX monitoring must be enabled when you start Apache Tomcat.

You can enable JMX by adding
`-Dcom.sun.management.jmxremote.port` to the following startup scripts:

For UNIX and Linux:

```
catalina.sh
```

For Microsoft Windows:

```
catalina.bat
```

For more information about remote monitoring and management, refer to the following link:

<http://download.oracle.com/javase/1.5.0/docs/guide/management/agent.html>

- The following are installed:
Enterprise Manager 11g Grid Control Release 1 (11.1.0.1) or higher (*Oracle Management Service and Oracle Management Agent*)
OR
Enterprise Manager 10g Grid Control Release 2 (10.2.0.1) or higher, and Oracle Management Agent 10g Release 2 (10.2.0.3) or higher.

You can install the Management Agent on the same computer as Apache Tomcat (referred to as local Agent monitoring) or on a different computer (referred to as remote Agent monitoring). The way you configure the local or remote Management Agent is the same.

If you are using a remote Management Agent, then ensure that the Management Agent has access to the computer on which Apache Tomcat instance is running and the JMX port on which it is listening.

- For monitoring an Apache Tomcat target, do not use a Management Agent that is already monitoring one of the following:
 - BEA WebLogic Managed Server
 - IBM WebSphere Application Server
 - JBoss Application Server

This is because different target types use different JMX versions, which could lead to metric collection errors for Apache Tomcat.

The following is an example of such a metric collection error for Apache Tomcat:

```
oracle.sysman.emSDK.emd.fetchlet.FetchletException:  
oracle.sysman.emSDK.emd.fetchlet.FetchletException:  
java.lang.SecurityException: sealing violation: package javax.management  
is sealed
```

Deploying the Plug-in

After you ensure that the prerequisites are met, follow these steps to deploy the management plug-in:

1. Download the Apache Tomcat plug-in archive file to your computer.
2. Log in to Enterprise Manager Grid Control as a Super Administrator.
3. On the Grid Control Home page, from the upper-right corner of the page, click **Setup**.
4. On the Setup Page, from the left panel, click **Management Plug-ins**.
The Management Plug-ins page appears.
5. On the Management Plug-ins page, click **Import**.
6. On the Import Management Plug-ins page, in the **Select Management Plug-in Archive** section, click **Browse** and select the plug-in archive.
7. Click **List Archive**.
8. Select the plug-in and click **OK**.
9. On the Management Plug-ins page, from the table, find the name of the Apache Tomcat target, and click the icon in the **Deploy** column.
The Deploy Management Plug-in wizard appears.
10. On the Deploy Management Plug-in: Select Targets page, click **Add Agents** and select one or more Management Agents to which you want to deploy the plug-in.
The wizard reappears and displays the Management Agents you selected.

11. Click **Next**, then click **Finish**.

If you see an error message stating that the preferred credential is not set up, go to the Preferences page and add the preferred credentials for the Agent target type. To access the Preferences page, from the top-right corner of the Grid Control console, select **Preferences**.

If there are no errors, then you will see the following screen:

Figure 1 Successful Deployment

The screenshot shows the Oracle Enterprise Manager 10g Grid Control interface. The main content area is titled "Management Plug-ins" and contains a table of installed plug-ins. The table has the following columns: Select, Name, Version, Deployed Agents, Description, Deployment Requirements, Deploy, and Undeploy. The table lists several plug-ins, including tomcat, sybase_ase, oracle_orchart_10203, microsoft_sqlserver_database, and juniper_netscreen_firewall. The "Deployed Agents" column shows the number of agents for each plug-in. The "Deploy" and "Undeploy" columns contain icons for managing the plug-ins.

Select	Name	Version	Deployed Agents	Description	Deployment Requirements	Deploy	Undeploy
<input type="checkbox"/>	tomcat	1.0.3.0.0	2	Management Plugin to define a 'Apache Tomcat' target type	Apache Tomcat must be running JDK 1.5 which is jmx remote ...		
<input type="checkbox"/>	sybase_ase	1.0.3.0.0	0	This plug-in offers monitoring, configuration and ...	Requires network access and proper credentials to Sybase ...		
<input type="checkbox"/>	oracle_orchart_10203	7.2	1	Test Plug-in: Org chart monitoring. Includes Job Type(s)	No requirements. Should run anywhere.		
<input type="checkbox"/>	microsoft_sqlserver_database	4.0.3.0.0	2	Microsoft SQL Server monitoring (including reports) and ...	Requires network access and proper credentials to Microsoft ...		
<input type="checkbox"/>	microsoft_sqlserver_database	3.1.3.1.0	1	Microsoft SQL Server monitoring (including reports) and ...	Requires network access and proper credentials to Microsoft ...		
<input type="checkbox"/>	microsoft_iis	2.1.2.1.0	1	Management Plugin to define a 'Microsoft IIS 6.0' target ...	Requires network access and credentials of the host where ...		
<input type="checkbox"/>	juniper_netscreen_firewall	2.0.1.0.0	2	Juniper Netscreen Firewall monitoring including reports	Requires network access to firewall device. Refer to ...		

Adding Instances for Monitoring

After successfully deploying the plug-in, follow these steps to add the plug-in target to Grid Control for central monitoring and management:

1. Login to Enterprise Manager Grid Control.
2. Click the **Targets** tab, and then the **All Targets** subtab.
The All Targets page appears.
3. On the All Targets page, from the **Search** list, select **Agent** and click **Go**.
4. From the list Agents displayed in the table, identify the Agent where the Apache Tomcat plug-in is deployed.
5. Click the name of the identified Agent.
The Agent Home page appears.

- On the Agent Home page, in the Monitored Targets section, from the **Add** list, select the **Apache Tomcat** target type and then click **Go**.

The Add Apache Tomcat page appears.

- On the Add Apache Tomcat page, provide the following information for the properties:
 - Host— Host of the Apache Tomcat instance. This property is always required.
 - JMX Port Number — Remote JMX port. This property is always required.
 - JMX User Name — Required when authentication is enabled for JMX.
 - JMX Password — Required when authentication is enabled for JMX.
 - Communication Protocol — Communication protocol used by remote JMX client. Do not change the default value specified unless the remote JMX implementation has changed.
 - Service Name— JMX service name. Do not change the default value specified unless the remote JMX implementation has changed.
 - SSL Trust Store—Required when SSL is enabled for Apache Tomcat.
 - SSL Trust Store JMX Password— Required when SSL is enabled for Apache Tomcat.
 - Apache Tomcat Version—Version of Apache Tomcat, e.g. 5.0.3, 5.5.23, etc. This property is always required, and is used to determine the specific performance metrics to be monitored and/or collected.

Note: You must not change the default values of Communication Protocol and Service Name unless the remote JMX implementation has changed.

Figure 2 Add Apache Tomcat Page

Oracle Enterprise Manager 10g
Control

Home Targets Deployments Alerts Compliance Jobs Reports

Enterprise Manager Configuration | Management Services and Repository | Agents

Add Apache Tomcat Cancel OK

Properties

Name: Tomcat
Type: Apache Tomcat

Name	Value
Host	stac02.us.oracle.com
JMX Port Number	9999
JMX User Name (required when authentication is enabled for JMX)	
JMX Password (required when authentication is enabled for JMX)	
Communication Protocol	jmi
Service Name	jmxrmi
SSL Trust Store (required when SSL is enabled)	
SSL Trust Store JMXPassword (required when SSL is enabled)	
Apache Tomcat Version (e.g. 5.0.3, 5.5.23, etc)	6.0.14

After deploying and configuring the plug-in to monitor one or more targets in the environment, you can customize the monitoring settings of the plug-in. This alters the collection intervals and threshold settings of the metrics to meet specific needs of your environment. If you decide to disable one or more metric collections, this could impact the reports that the metric is a part of.

Verifying and Validating the Plug-in

After waiting for a few minutes for the plug-in to start collecting data, use the following steps to verify and validate that Grid Control is properly monitoring the plug-in target:

1. On the Agent home page, from the **Monitored Targets** table, click the Apache Tomcat target link.

The Apache Tomcat home page appears.

Figure 3 Apache Tomcat Home Page

The screenshot shows the Oracle Enterprise Manager 10g Grid Control interface for the Apache Tomcat target. The top navigation bar includes 'Home', 'Targets', 'Deployments', 'Alerts', 'Compliance', 'Jobs', and 'Reports'. The main content area shows the target status as 'Up' with a green arrow icon, and availability as 'Not Applicable (Last 24 Hours)'. The host is listed as 'stado65.us.oracle.com'. Below this, there are sections for 'Alerts' and 'Host Alerts', both showing 'No Alerts found.' There are also sections for 'Configuration' and 'Related Links' with various links for viewing and comparing configurations, and monitoring settings.

2. Verify that no metric collection errors are reported in the Alerts section.
3. Ensure that reports can be seen and no errors are reported by selecting the **Reports** property page.

Undeploying the Plug-in

Follow these steps to undeploy the plug-in from a Management Agent:

1. Log in to Enterprise Manager Grid Control as a Super Administrator.
2. Select the **Targets** tab, and then the **All Targets** subtab.

3. Select Apache Tomcat Plug-in target and click **Remove**. You must do this step for all targets of the plug-in.
4. Make sure that the preferred credentials are set on the Management Agents where the plug-in is deployed. To access the Preferences page, from the top-right corner of the Grid Control console, select **Preferences**.
5. On the Grid Control Home page, from the upper-right corner of the page, click **Setup**.
6. On the Setup Page, from the left panel, click **Management Plug-ins**.
The Management Plug-ins page appears.
7. On the Management Plug-ins page, from the **Undeploy** column of the table, click the icon for Apache Tomcat.
The Undeploy Management Plug-in page appears.
8. Check all the Agents that are currently deployed with the Apache Tomcat Plug-in and click **OK**.
You must undeploy the plug-in from every Management Agent in the system to completely remove it from the enterprise.
9. On the Management Plug-ins page, select the Apache Tomcat Plug-in and click **Delete**.

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