

Oracle® Enterprise Manager

System Monitoring Plug-in Installation Guide for Apache Tomcat



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The Oracle logo, consisting of a solid red square with the word "ORACLE" in white, uppercase, sans-serif font centered within it.

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Preface

This document provides a description of the Oracle system monitoring plug-in for Apache Tomcat, details on the versions the plug-in supports, prerequisites for installing the plug-in, and step-by-step instructions on how to download, install, verify, and validate the plug-in.

Audience

This document is intended systems and database administrators tasked with monitoring Apache Tomcat through Enterprise Manager.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

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Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

What's Changed

This table provides a brief overview of the document changes for the latest publication of the *Oracle Enterprise Manager System Monitoring Plug-in Installation Guide for Apache Tomcat*:

Part Number	Change Summary
F97221-01	Updated for Enterprise Manager 24 Release 1.

1

Apache Tomcat Plug-in Overview and Prerequisites

This chapter provides an overview description of the Oracle system monitoring plug-in for Apache Tomcat and summarizes the prerequisites required before configuration. The following topics are provided:

- [Apache Tomcat Plug-in Overview and Feature Summary](#)
- [Supported Versions](#)
- [Apache Tomcat Plug-in Prerequisites](#)
- [Downloading the Apache Tomcat Plug-in](#)
- [Deploying the Plug-in](#)
- [Upgrading the Plug-in](#)
- [Undeploying the Plug-in](#)

Apache Tomcat Plug-in Overview and Feature Summary

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 Non-Oracle Middleware plug-in for Apache Tomcat extends Oracle Enterprise Manager 24 Release 1 to add support for managing it.

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

- Monitor Tomcat instances.
- Gather configuration data and track configuration changes for Tomcat instances.
- Raise alerts and violations based on thresholds set on monitored metrics and configuration data.
- Provide rich out-of-box reports through Enterprise Manager's Information Publisher reports feature based on the gathered data.
- Support monitoring by a local or remote Agent. Local Agent is an agent that is running on the same host as the Apache Tomcat server. Remote Agent is an agent running on a host that is different from the host where Apache Tomcat is running.
- Oracle Enterprise Manager Jobs that allow for the following management of Apache Tomcat:
 - Starting an application
 - Stopping an application
 - Starting a server
 - Stopping a server
 - Running a configuration test

Supported Versions

This plug-in supports the following versions of products:

- Enterprise Manager 24 Release 1
 - This plug-in is certified for the latest release of Oracle Enterprise Manager 24.1.
- Apache Tomcat Release 8, 8.5, 9, and 10

To view the complete list of certified products, you can access the Enterprise Manager certification matrix by following these steps:

1. Sign in to My Oracle Support: <http://support.oracle.com>
2. Click the **Certifications** tab.
3. In the **Certification Search**, from the **Product** list, select one of the following:
 - **Enterprise Manager Base Platform - OMS**, to view the certification for OMS.
 - **Enterprise Manager Base Platform - Agent**, to view the certification for Management Agent.
4. From the **Release** list, select release version, and then click **Search**.

Apache Tomcat Plug-in Prerequisites

The following prerequisites must be met before you can deploy the plug-in. Patches are available from My Oracle Support (<https://support.oracle.com>):

1. Enterprise Manager (Oracle Management Server and Oracle Management Agent) must be installed.
2. Ensure JMX is enabled on Apache Tomcat. For more information, see Apache's documentation on [Enabling JMX Remote](#).

Downloading the Apache Tomcat Plug-in

In Enterprise Manger Release 24.1, the Tomcat plug-in is not available in the Oracle Shiphome. If you are upgrading from Enterprise Manager Release 13.5, with existing Tomcat targets, the Tomcat targets will also appear in Enterprise Manager Release 24.1.

You can download the plug-in in Enterprise Manger from the Extensibility page.

To download the Tomcat plug-in:

1. In **Enterprise Manager** go to **Setup**, select **Extensibility**, and then select **Self Update**.
2. Expand Plug-in folder, go to **Middleware**.

 **Note:**

If you enter Apache Tomcat in the search option, you can see all available versions.

3. Find the Apache Tomcat plug-in, and then download the latest version and deploy.

You can download plug-ins in online or offline mode. *Online mode* refers to an environment where you have Internet connectivity, and can download the plug-in directly through Enterprise Manager from My Oracle Support. *Offline mode* refers to an environment where you do not have Internet connectivity, or where the plug-in is not available from My Oracle Support.

For more information on downloading the plug-ins, see *Managing Plug-ins* in the Oracle Enterprise Manager Administrator's Guide.

Deploying the Plug-in

You can deploy the plug-in to an Oracle Management Service instance using the Enterprise Manager console, or using the EM Command Line Interface (EMCLI). While the console enables you to deploy one plug-in at a time, the command line interface mode enables you to deploy multiple plug-ins at a time, that can save plug-in deployment time and downtime.

See the *Managing Plug-ins* chapter in the *Oracle Enterprise Manager Administrator's Guide* for instructions on deploying the plug-in.

Upgrading the Plug-in

The Self Update feature allows you to expand Enterprise Manager's capabilities by updating Enterprise Manager components whenever new or updated features become available. Updated plug-ins are made available via the Enterprise Manager Store, an external site that is periodically checked by Enterprise Manager to obtain information about updates ready for download. See the *Updating Enterprise Manager* chapter in the *Oracle Enterprise Manager Administrator's Guide* for steps to update the plug-in.

Undeploying the Plug-in

See the *Managing Plug-ins* chapter in the *Oracle Enterprise Manager Administrator's Guide* for steps to undeploy the plug-in.

2

Discovering Apache Tomcat Target

To discover your Apache Tomcat target with Enterprise Manager you can:

- [Discover Targets](#)
- [Adding Targets with EMCLI](#)
- [Verify and Validate the Plug-in](#)

Discovering Targets

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

1. Log in to Enterprise Manager.
2. Click **Setup**, select **Add Targets**, and then select **Add Targets Manually**.
3. In the Add Targets Manually page, select **Add Target Manually** under Add Non-Host Targets Manually, select **Target Type** as **Apache Tomcat**, select a **Monitoring Agent** and click **Add Manually**.
4. In the Add Apache Tomcat page, enter the following properties:
 - **Target Name:** Unique target name across all targets, such as `Apache_Tomcat_Hostname`. This is the display name in Enterprise Manager. It represents this SQL Server target across all user interfaces within Enterprise Manager.
 - **Apache Tomcat Monitoring Credentials**
 - **Apache Tomcat JMX Username:** The username used to connect via JMX to Apache Tomcat. This is optional and should only be used if you are using authentication.
 - **Apache Tomcat JMX Password:** The password for the account used to connect via JMX to Apache Tomcat. This is optional and should only be used if you are using authentication.
 - **Apache Tomcat SSL Truststore Password:** The password for the truststore used to connect via JMX to Apache Tomcat. This is optional and should only be used if you are connecting with SSL.

 **Note:**

The Trust Store path is required under properties.

- **Properties**
 - **Communication Protocol:** This is the protocol used by JMX to connect to Apache Tomcat. In most cases, this will be 'rmi'.
 - **Host:** This is the hostname of the server Apache Tomcat is running on.
 - **JMX Port Number:** This is the port used to connect to Apache Tomcat via JMX.

- **SSL Trust Store:** This is the trust path to the trust store being used to connect to Apache Tomcat via SSL. This is optional and should only be used if you are connecting using SSL.
- **Service Name:** This is the unique identifier used to connect to help make the JMX Connection to Apache Tomcat. In most cases this will be 'jmxrmi'.

Adding Targets with EMCLI

Add Apache Tomcat targets with EMCLI.

To add Apache Tomcat targets with EMCLI, use the `add_target` verb:

```
emcli.bat add_target
  -name="Tomcat Target"
  -type="apache_tomcat"
  -host="HostTargetName"
  -properties="host:HostTargetName;
              JMXProtocol:rmi;
              JMXService:jmxrmi;
              JMXPort:1099"
```

You will need to specify the following options:

Target name: `*-name*` It must begin with an alphabetic character contain only alphanumeric characters, multibyte characters, a space, -, _, ., :, /, (,) and have a maximum length of 256 characters.

Target type: `*-type*` Always use "apache_tomcat" (including the quotes).

Host name: `*-host*` Network name of the machine running the Management Agent that is collecting data for this target instance.

Target instance Properties: `*-properties*` Name-value pair list of properties for the target instance. The available property names are as follows.

```
Host
JMXPort
JMXUsername
JMXPassword
JMXProtocol
JMXService
SSLTrustStore
SSLTrustStorePassword
```

Properties separator delimiter: `*-separator=properties*` Specify a string delimiter to use between name-value pairs for the value of the `-properties` option. The default separator delimiter is ";".

Properties subseparator delimiter: `*-subseparator=properties*` Specify a string delimiter to use between name and value in each name-value pair for the value of the `-properties` option. The default subseparator delimiter is ":".

Verifying and Validating the Plug-in

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

1. Click the **Apache Tomcat** target link from the All Targets page.
2. Verify no metric collection errors are reported by clicking **Monitoring** and then **Metric Collection Errors** from the **Target** menu.
3. Ensure that reports can be seen, and no errors are reported by clicking **Information Publisher Reports** in the **Target** menu and viewing reports for the Apache Tomcat target type.
4. Ensure that configuration data can be seen by clicking **Configuration** and then **Last Collected** in the **Target** menu. If configuration data does not immediately appear, click **Refresh** in the Latest Configuration page.

3

Creating, Editing, and Using Jobs

This chapter describes how to create and edit jobs in Enterprise Manager for Apache Tomcat.

- [Creating and Editing Jobs](#)

Creating and Editing Jobs

To create and edit jobs, follow these steps:

1. In Enterprise Manager Cloud Control 13c, click **Enterprise**, then **Job**, then click **Activity**.
2. On the Job Activity Page, select a job type from the **Create Job** menu and click **Go**. Select one of the following:
 - Apache Tomcat – Config Test
 - Apache Tomcat – Start Application
 - Apache Tomcat – Start Server
 - Apache Tomcat – Stop Application
 - Apache Tomcat – Stop Server
3. In the **General** tab of the Create <Job Type> page, provide a name for the job and add the individual targets or one composite target such as a Group.

 **Note:**

If you are editing a job, then modify the job name and the selected targets.

4. In the **Parameters** tab of the Create <Job Type> page, from the **Options** menu, select an appropriate option to make the job function according when it starts.

Table 3-1 Job Parameters Options

Job Type	Available Options
Apache Tomcat – Config Test	Override path to \$CATALINA_HOME\bin – Allows the user to override the path to the bin folder.
Apache Tomcat – Start Application	Application to start – Name of the application to start up.
Apache Tomcat – Start Server	Override path to \$CATALINA_HOME\bin – Allows the user to override the path to the bin folder.
Apache Tomcat – Stop Application	Application to stop – Name of the application to shut down.
Apache Tomcat – Stop Server	Override path to \$CATALINA_HOME\bin – Allows the user to override the path to the bin folder.

5. In the **Credentials** tab of the Create <Job Type> Job page, select an appropriate option for credentials.

You can choose to use the preferred credentials that are already set or override the preferred credentials with new credentials. In either case, you need to provide credentials for the agent host.

To set the preferred credentials, click **Preferences** at the top-right corner of the Cloud Control console. From the left-vertical navigation bar, click **Preferred Credentials**. Cloud Control displays the Preferred Credentials page. On this page you can set the preferred credentials.

6. In the **Schedule** tab of the Create <Job Type> Job page, schedule the job.
7. In the **Access** tab of the Create <Job Type> Job page, define or modify the access you want other users to have to this job.
8. Click **Submit** to create the job.

4

Using Reports

This chapter describes how to use the reports that the plug-in for Apache Tomcat provides. Use the available out-of-the-box reports to aid administrators with critical tasks such as problem diagnosis, trend analysis, and capacity planning.

- [Using the Apache Tomcat Plug-in Reports](#)

Using the Apache Tomcat Plug-in Reports

The Apache Tomcat plug-in includes 11 out-of-the-box reports:

Table 4-1 Apache Tomcat Reports

Report	Description
All Applications Load	Applications load charts at server level
Apache Tomcat Application Cache Charts	Application cache charts for the last 24 hours
Apache Tomcat JSP Load	JSP Load for the last 24 hours
Apache Tomcat Load	Charts of total load on all global request processors
Apache Tomcat Thread Pools	Thread Pools active and total thread counts on charts
Datasources	Data sources active connections and idle connection charts
Garbage Collector	Tomcat Garbage Collector
Global Request Processors Load and Performance	Global request processors load and performance
Memory Utilization	Resource utilization charts
Top 10 Applications Based on Sessions Created Rate	Top 10 applications based on session created rate during the last 24 hours
Top 10 Servlets Based on Request Rate	Top 10 servlets based on average request rate during the last 24 hours

To generate a new report from one of the out-of-the-box reports, you can complete these steps:

1. From the Enterprise menu, select **Reports**, then **Information Publisher Reports**.
2. Scroll down to the Apache Tomcat section, find the desired report, and click the report title hyperlink.
3. Select the target you want this report to run against and click **Continue**. After clicking **Continue**, the desired report will generate.

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