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for Oracle TimesTen In-Memory Database User's Guide

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Oracle Enterprise Manager for Oracle TimesTen In-Memory Database User's Guide Release 13.3.1.0.0

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Preface

The Enterprise Manager Plug-in for Oracle TimesTen In-Memory Database extends Oracle Enterprise Manager Cloud Control to add support for monitoring TimesTen databases.

Audience

This document is intended for TimesTen system administrators and users of Enterprise Manager. System administrators can use the Enterprise Manager Plug-in for TimesTen to monitor and configure a TimesTen database.

Related documents

TimesTen documentation is available at:

https://docs.oracle.com/database/timesten-18.1

Oracle Enterprise Manager documentation is available at:

https://docs.oracle.com/en/enterprise-manager/

This may be especially useful for Oracle Enterprise Manager features that TimesTen supports but does not attempt to fully document.

Conventions

TimesTen supports multiple platforms. Unless otherwise indicated, the information in this guide applies to all supported platforms. The term Windows refers to all supported Windows platforms. The term UNIX applies to all supported UNIX platforms. The term Linux is used separately. Refer to the "Platforms" section in *Oracle TimesTen In-Memory Database Release Notes* for specific platform versions supported by TimesTen.

> **Note:** In TimesTen documentation, the term "TimesTen plug-in" refers to the Enterprise Manager Plug-in for Oracle TimesTen In-Memory Database.

This document uses the following text conventions:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	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.
`italic monospace`	Italic monospace type indicates a placeholder or a variable in a code example for which you specify or use a particular value. For example: `LIBS = -Ltimesten_home/install/lib -ltten` Replace *`timesten_home`* with the path to the TimesTen instance home directory.
[ ]	Square brackets indicate that an item in a command line is optional.
{ }	Curly braces indicated that you must choose one of the items separated by a vertical bar (|) in a command line.
|	A vertical bar (or pipe) separates alternative arguments.
. . .	An ellipsis (. . .) after an argument indicates that you may use more than one argument on a single command line.
% or $	The percent sign or dollar sign indicates the UNIX shell prompt, depending on the shell that is used.
#	The number (or pound) sign indicates the UNIX root prompt.

TimesTen documentation uses these variables to identify path, file and user names:

Convention	Meaning
`installation_dir`	The path that represents the directory where TimesTen is installed.
`timesten_home`	The path that represents the home directory of a TimesTen instance.
`DSN`	The data source name.

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What's New

This section summarizes the new features and functionality of the Enterprise Manager Plug-in for Oracle TimesTen In-Memory Database Release 13.3.1.0.0 that are documented in this guide, providing links into the guide for more information.

- New features in release 13.3.1.0.0
- New features in release 13.1.1.0.0

New features in release 13.3.1.0.0

- This release adds support to instances and databases from TimesTen Classic in Release 18.1 (18.1.2.1.0 or higher).

New features in release 13.1.1.0.0

- You can click on the legend label of a graph to visually enable or disable the respective data from the graph.
- The tooltip for the data of graphs now has a line that goes down to the x-axis of the graph to make it easier to read coordinate values.

1

Installing the Enterprise Manager Plug-in for TimesTen

The Enterprise Manager Plug-in for Oracle TimesTen In-Memory Database extends Oracle Enterprise Manager Cloud Control to add support for monitoring TimesTen databases.

This chapter focuses on the installation of the TimesTen plug-in.

Topics include:

- Installation prerequisites
- Installing the Enterprise Manager Plug-in for TimesTen
- Verifying and validating the plug-in
- Setting preferred credentials for a target
- Changing the monitoring configuration of a TimesTen database target
- Upgrading the Enterprise Manager Plug-in for TimesTen
- Uninstalling the Enterprise Manager Plug-in for TimesTen

> **Note:** The instructions and screenshots of this user's guide are based on Oracle Enterprise Manager Cloud Control 13*c* Release 1.

Installation prerequisites

Before installing the Enterprise Manager Plug-in for TimesTen:

- Install Oracle Enterprise Manager Cloud Control 13*c* Release 1 (or higher) for OMS, Enterprise Manager Repository, and Agent. Ensure that the agent can successfully communicate with your Oracle Enterprise Manager Server and can upload data.
- Install Oracle TimesTen In-Memory Database Release 11.2.2 (11.2.2.8.0 or higher) or Release 18.1 (18.1.2.1.0 or higher).

> **Note:** The Oracle Enterprise Manager Cloud Control Agent and the TimesTen database must reside on the same system.

When you configure your TimesTen instance target, you need to know:

- The name of your TimesTen instance

When you configure your TimesTen database target, you need to know:

- The name of your TimesTen instance
- DSN

  The DSN must be a system DSN that is described in either your `sys.odbc.ini` file or the ODBC Data Source Administrator on Microsoft Windows.
- The TimesTen database user name and password
  - The user name and password are required when you configure the TimesTen target.
  - The user you specify when you configure the TimesTen target must have `ADMIN` privileges. The user cannot be the instance administrator.
- If your TimesTen database uses TimesTen Cache features, you need to know the cache admin/cache manager user name, the Oracle database cache admin password, and the TimesTen database cache manager password.
  - The cache admin/cache manager user name needs to exist on the TimesTen database and the Oracle database.

Note: Be sure the TimesTen database specified by the instance and DSN is loaded into memory.

For information on your TimesTen instance, run the `ttStatus` or `ttVersion` utility. For more information, see "ttStatus" or "ttVersion" in the *Oracle TimesTen In-Memory Database Reference*.

Additional requirements

Additional requirements or considerations include:

- Use direct linked connections to define your target DSN. Client/Server connections are not supported for your target DSN.
- The Enterprise Manager Plug-in for TimesTen generates temporary files. Each temporary file could require between 10 KB to 30 KB of free space on the Oracle Enterprise Manager Agent file system. If the Oracle Enterprise Manager Agent file system is full, the Oracle Enterprise Manager Agent can no longer monitor the TimesTen database. For information about the system requirements for the Oracle Enterprise Manager Agent, see "CPU, RAM, and Hard Disk Space Requirements for Oracle Management Agent, Enterprise Management Hybrid Cloud Agent, Enterprise Management Hybrid Cloud Gateway Agent" in the *Oracle Enterprise Manager Cloud Control Basic Installation Guide*.
- The operating system user who installs the Oracle Enterprise Manager Agent must belong to the TimesTen users group of the installation being monitored. Also, ensure that the user has read access to `/etc/TimesTen/instance_info`. For more information about the TimesTen users group, see "Understanding the TimesTen users group" in the *Oracle TimesTen In-Memory Database Installation, Migration, and Upgrade Guide*.
- For optimal performance, ensure that TimesTen is on a different system than the Oracle Management Service (OMS) and the Enterprise Manager Repository.
- Ensure that the My Oracle Support credentials are set up using the SYSMAN user. This is required to enable updates (plug-ins) to be downloaded from the My

Oracle Support site. For more information, see "Saving Preferred Credentials to Access My Oracle Support" in the *Oracle Enterprise Manager Cloud Control Security Guide*.

- Ensure that the Software Library (also known as the local store) is configured. Updates are downloaded to this local store before being deployed into Oracle Enterprise Manager Cloud Control. For more information, see "Configuring an OMS Shared Filesystem Location" in the *Oracle Enterprise Manager Cloud Control Administrator's Guide*.

Installing the Enterprise Manager Plug-in for TimesTen

To install the TimesTen plug-in for TimesTen, you must:

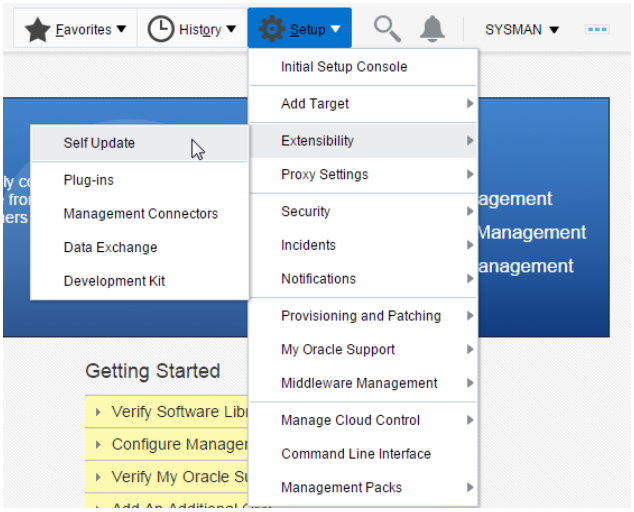
- Download the plug-in
- Deploy the plug-in on Oracle Management Service
- Deploy the plug-in on the Management Agent
- Configure a TimesTen target

Download the plug-in

To download the plug-in, ensure that you are on the Oracle Enterprise Manager Cloud Control home page and are logged in as user `SYSMAN`.

1. From the **Setup** menu, select **Extensibility**, then select **Self Update**.

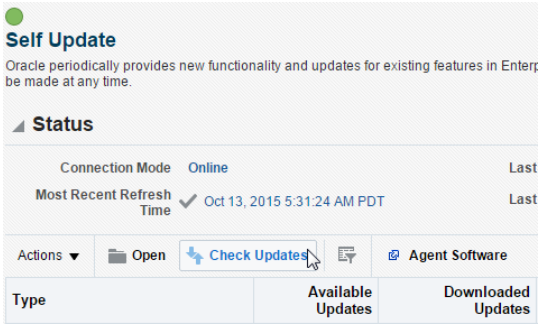
Figure 1–1 Select Self Update



The Self Update page displays.

2. Click **Check Updates**.

Figure 1–2 Click Check Updates



The Confirmation dialog displays. You should see the informational message: "A job has been submitted successfully to check for new updates from Oracle".

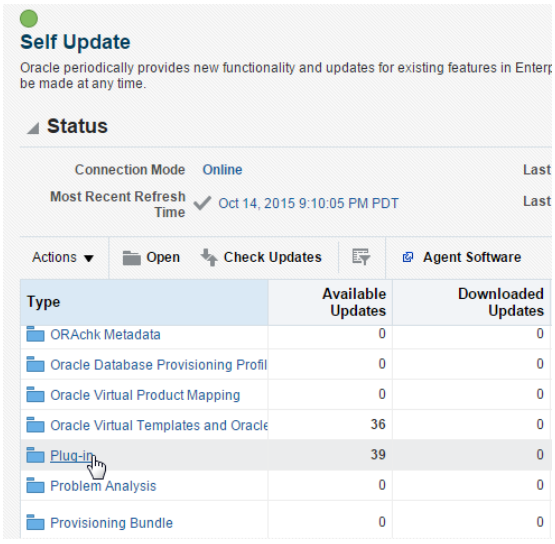
3. Click **OK**.

   The Self Update page displays with a Most Recent Refresh Time status indicating the status of the updates.

   - If you see a grey check mark next to the Most Recent Refresh Time status, then Enterprise Manager has finished checking for updates. Locate the Plug-in folder.
   - If you see a status of Submitted or In Progress... for the Most Recent Refresh Time status, then Enterprise Manager is still checking for updates. Click the refresh button located in the top right of the Oracle Enterprise Manager Cloud Control page to refresh the status of the Most Recent Refresh Time. After you see a grey check mark next to the Most Recent Refresh Time status, locate the Plug-in folder.

4. Click the name **Plug-in**.

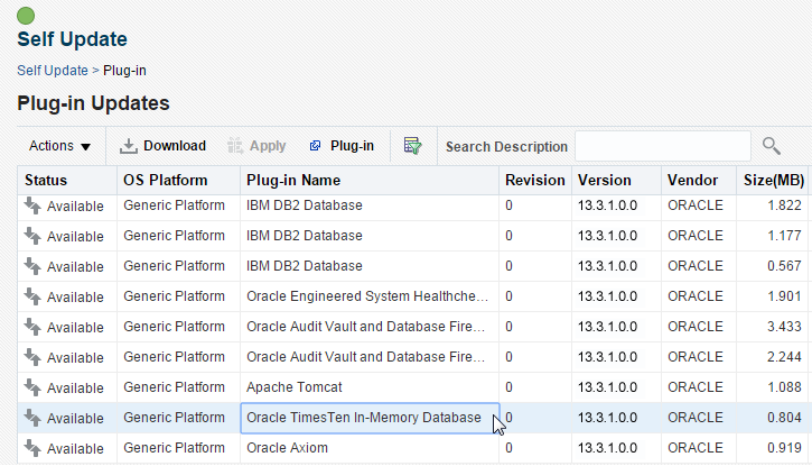
Figure 1–3 Plug-in folder



The Plug-in Updates page displays. In the Plug-in Name column, locate Oracle TimesTen In-Memory Database. Confirm the Status column is equal to Available.

5. In the Plug-in Name column, click **Oracle TimesTen In-Memory Database**.

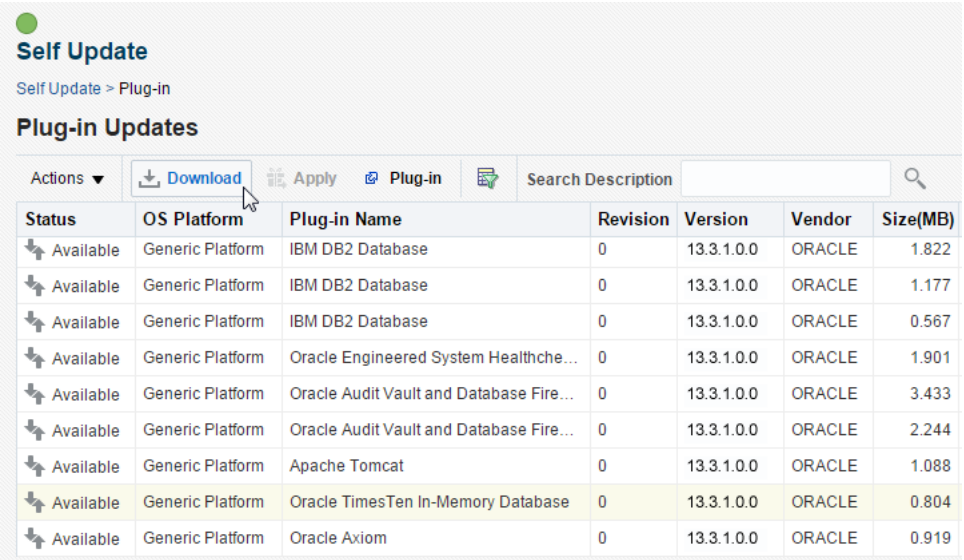
Figure 1–4 Plug-in Updates



Locate the Download button located under Plug-in Updates at the top of the page.

6. Click **Download**.

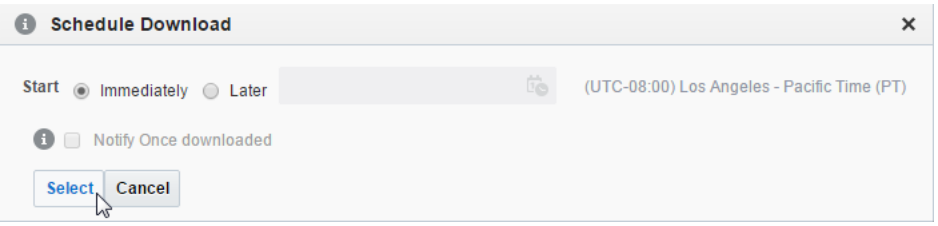
Figure 1–5 Download plug-in



The Schedule Download dialog displays indicating that you can download the plug-in either immediately or later. When you choose **Select**, Enterprise Manager downloads the plug-in immediately.

7. Click **Select**.

Figure 1–6 Schedule Download dialog



A confirmation dialog displays indicating that the update (plug-in) is downloading.

8. Click **OK**.

   You have successfully downloaded the plug-in. You can verify the plug-in has been downloaded by reviewing the Plug-in Updates page. You should see the Oracle TimesTen In-Memory Database plug-in with a status of Downloaded.

You are now ready to deploy the plug-in on the Oracle Management Service.

Deploy the plug-in on Oracle Management Service

You must deploy the plug-in on both the Oracle Management Service (OMS) and one or more Management Agents. After you successfully deploy the plug-in, both OMS and the agent know the plug-in exists. You then configure your TimesTen database as one of the targets for the agent and the agent begins the process of monitoring your target.

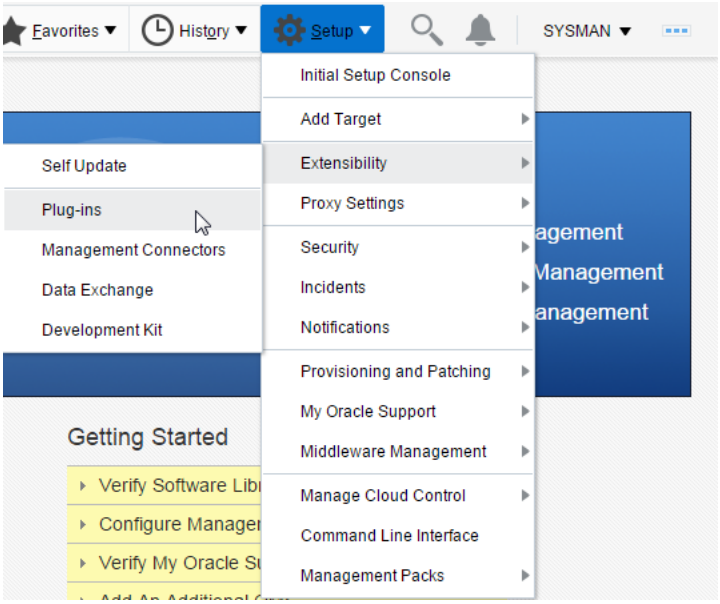
You must deploy the plug-in on OMS before deploying the plug-in on one or more Management Agents.

Note: If there is a failure when deploying the plug-in, the Management Repository could be in an inconsistent state. It is recommended that you back up the Management Repository before deploying the plug-in.

To deploy the plug-in on OMS, ensure that you are on the Oracle Enterprise Manager Cloud Control home page and are logged in as user `SYSMAN`.

1. From the **Setup** menu, select **Extensibility**, then select **Plug-ins**.

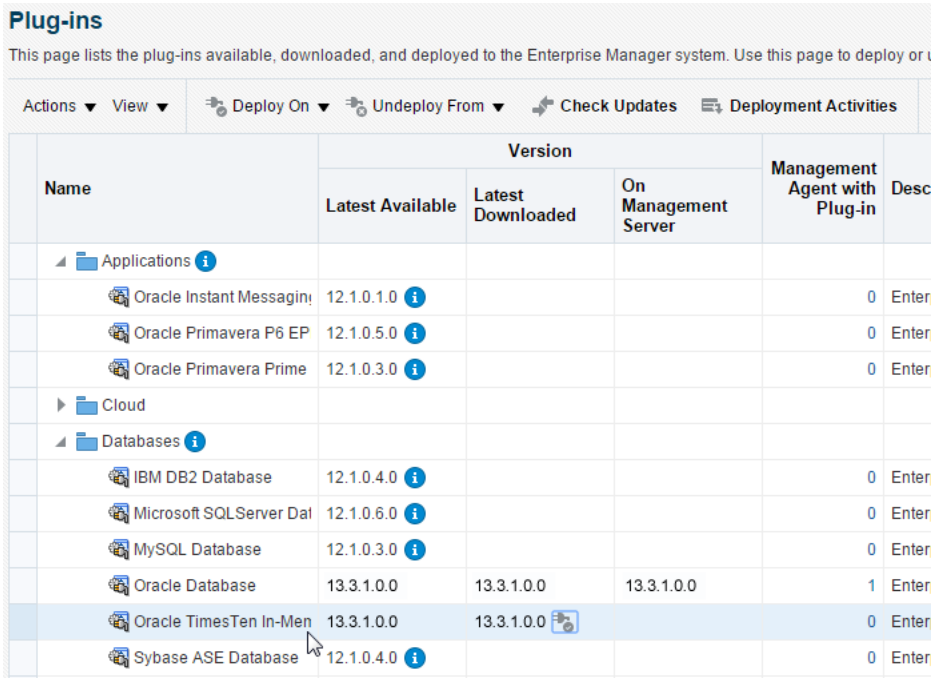
Figure 1–7 Select Extensibility, then Plug-ins



The Plug-ins page displays and you see the plug-ins that have been downloaded and can be deployed. Locate the Databases folder in the Name column.

2. Expand the Databases folder in the Name column and click **Oracle TimesTen In-Memory Database**.

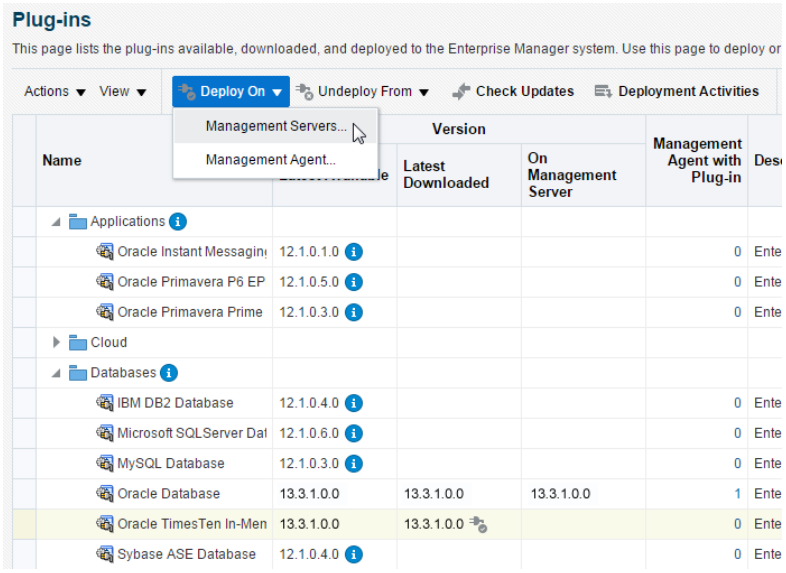
Figure 1–8 Select TimesTen In-Memory Database plug-in



You are now ready to deploy the plug-in on OMS. Locate the Deploy On tab at the top of the page.

3. From the **Deploy On** menu, select **Management Servers...**.

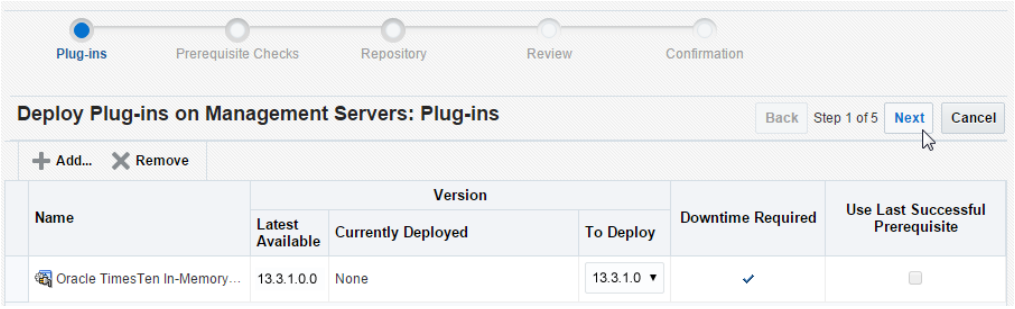
Figure 1–9 Deploy on OMS



The Deploy Plug-in on Management Servers: Plug-ins page displays. The plug-in **Oracle TimesTen In-Memory Database** is displayed in the Name column and the Version is auto-filled. Locate the Next button in the top right of the page.

4. Click **Next**.

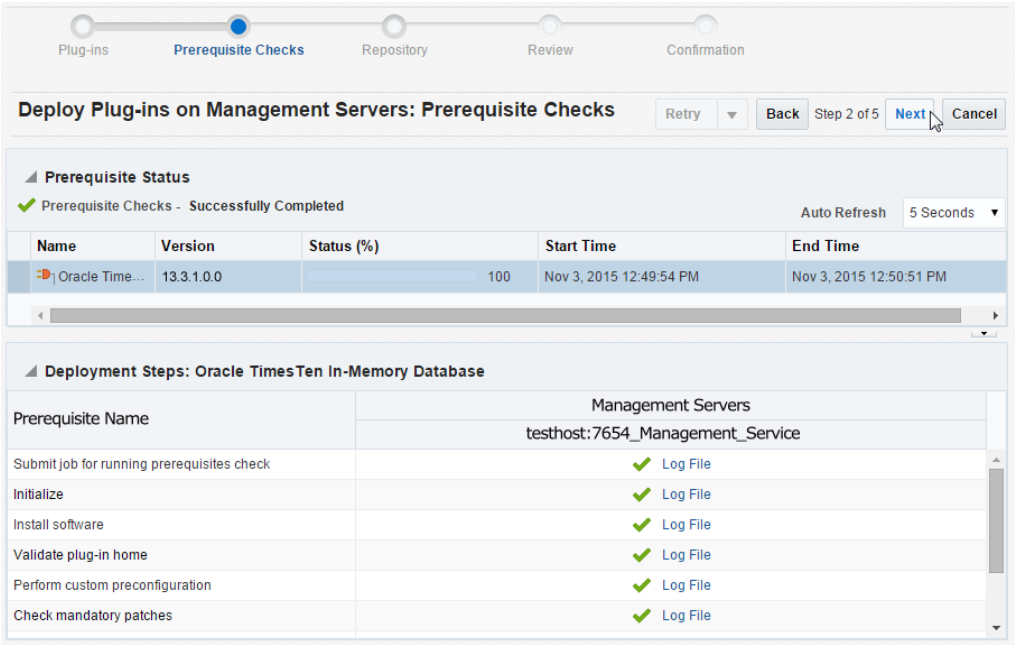
Figure 1–10 Click Next



The Deploy Plug-ins on Management Servers: Prerequisite Checks page displays. The prerequisite checks can take several minutes. In the Prerequisite Status region, you should see a check to the left of the Prerequisite Checks text. To the right of this text, you should see the text "Successfully Completed". Ensure that there are green checks in the Status column of each row in the Deployment Steps: Oracle TimesTen In-Memory Database table. Locate the Next button in the top right of the page.

5. Click **Next**.

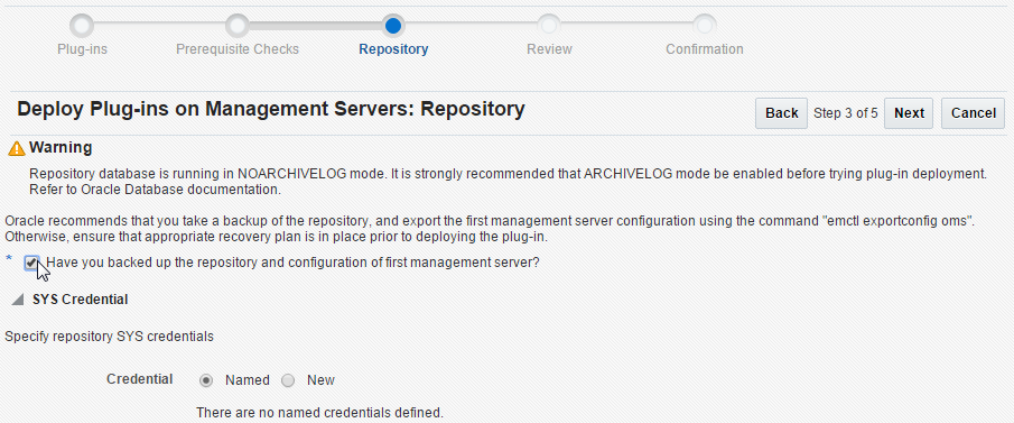
Figure 1–11 Click Next



The Deploy Plug-ins on Management Servers: Repository page displays. Consider making a backup of the OMS repository before deploying the plug-in. For more information on backing up the OMS repository, see "Backing Up the OMS" in the *Oracle Enterprise Manager Cloud Control Advanced Installation and Configuration Guide*. Locate the **Have you backed up the repository and configuration of first management server?** check box.

6. Select the **Have you backed up the repository and configuration of first management server?** check box.

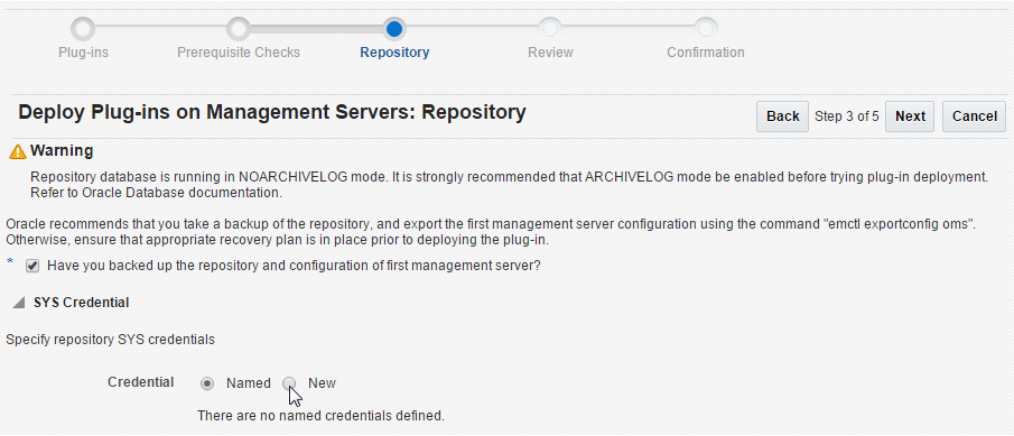
Figure 1–12 Select repository backup confirmation



You are now ready to specify repository SYS credentials. Locate the circle to the left of the New credential type.

7. Click in the circle to the left of the text **New**.

Figure 1–13 Select the new credential type option

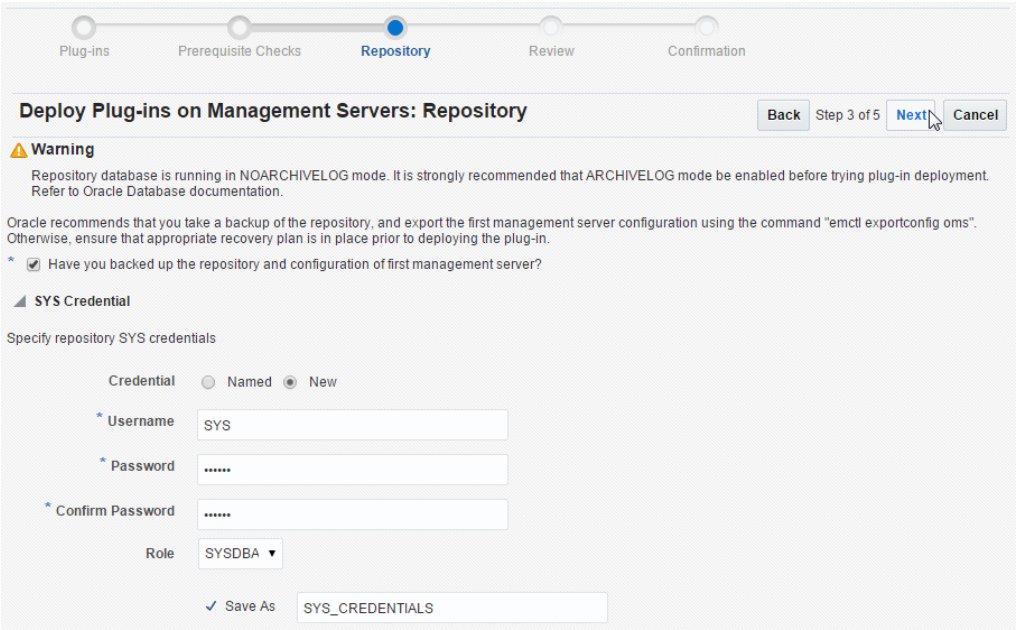


The Deploy Plug-Ins on Management Servers: Repository page refreshes. You are now required to enter the repository SYS credentials for your Enterprise Manager repository. The first property is the Username.

8. In the ***Username** text field, type the user who has access to the Enterprise Manager repository.
9. In the ***Password** text field, type the password for the user who has access to the Enterprise Manager repository.
10. In the ***Confirm Password** text field, re-type the password.
11. From the **Role** drop-down list, select SYSDBA.
12. Click in the check box to the left of the text **Save As**.
13. In the **Save As** text field, type the name you want to use for the preferred credentials. The credentials are saved with this name.

    Locate the Next button at the top right of the page.
14. Click **Next**.

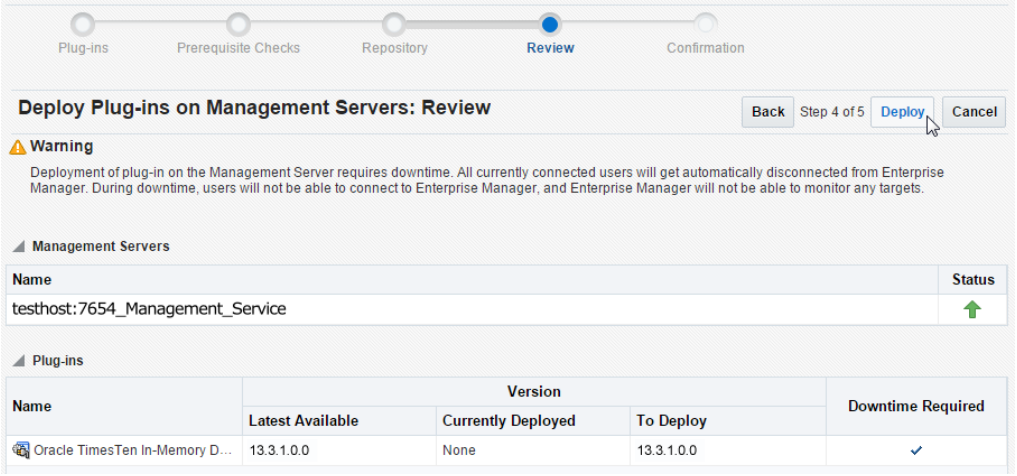
Figure 1–14 Review of the deploy on OMS



The Deploy Plug-ins on Management Servers: Review page displays. In the Management Servers table, verify that the name of the management server is correct. Verify the status is up. In the Plug-ins table, verify that the name of the plug-in is Oracle TimesTen In-Memory Database. Locate the Deploy button at the top right of the page.

15. Click **Deploy**.

Figure 1–15 Confirmation of the deployment to OMS



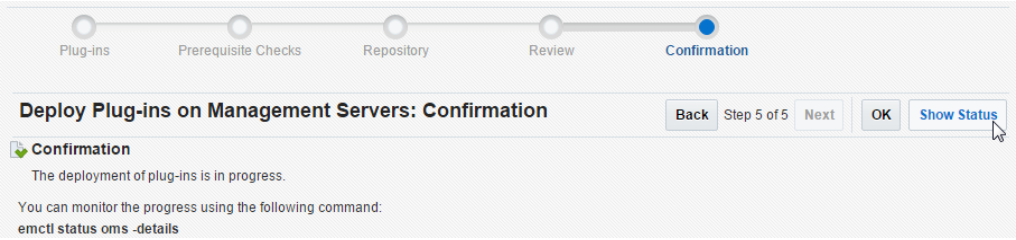
Note: The Oracle Enterprise Manager Cloud Control server restarts during the deployment process.

The Deploy Plug-ins on Management Servers: Confirmation page displays with a message indicating the deployment of the plug-in is in progress. The deployment

can take several minutes. You can monitor the deployment status by clicking Show Status or going to the Deployment Activities page.

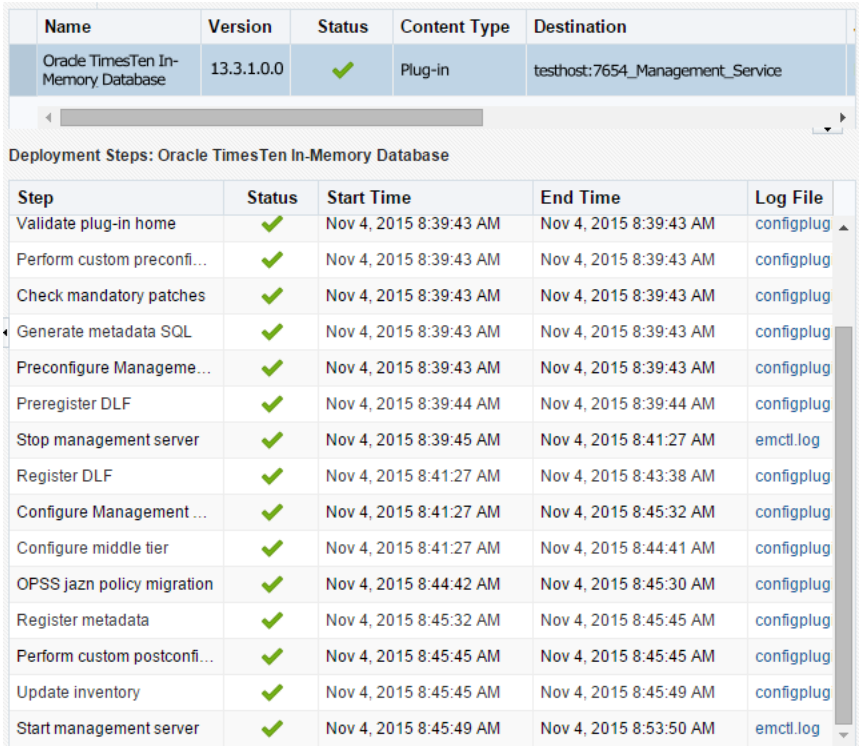
16. Click **Show Status**.

Figure 1–16 Click show status



The Plug-ins Deployment Activities page displays showing the status of recent deployment activities and a detailed status of the TimesTen deployment steps in table format. The second table on this page, Deployment Steps: Oracle TimesTen In-Memory Database, shows the deployment steps for the TimesTen plug-in. The last step located in the last row of this table is named "Start management server". Once this step is completed, ensure that there are green checks in the Status column of each row in the Deployment Steps table. Such checks indicate all steps in the deployment process are completed and are successful. If auto refresh is set to off, you may want to set auto refresh to 15 seconds, so you can see the steps as they are completed. You may need to wait a few minutes before changing the auto refresh setting because the Oracle Enterprise Manager Cloud Control server restarts during this deployment.

Figure 1–17 Deployment to OMS successful



Name	Version	Status	Content Type	Destination
Oracle TimesTen In-Memory Database	13.3.1.0.0	✓	Plug-in	testhost:7654_Management_Service

Deployment Steps: Oracle TimesTen In-Memory Database

Step	Status	Start Time	End Time	Log File
Validate plug-in home	✓	Nov 4, 2015 8:39:43 AM	Nov 4, 2015 8:39:43 AM	configplug
Perform custom preconfi...	✓	Nov 4, 2015 8:39:43 AM	Nov 4, 2015 8:39:43 AM	configplug
Check mandatory patches	✓	Nov 4, 2015 8:39:43 AM	Nov 4, 2015 8:39:43 AM	configplug
Generate metadata SQL	✓	Nov 4, 2015 8:39:43 AM	Nov 4, 2015 8:39:43 AM	configplug
Preconfigure Manageme...	✓	Nov 4, 2015 8:39:43 AM	Nov 4, 2015 8:39:43 AM	configplug
Preregister DLF	✓	Nov 4, 2015 8:39:44 AM	Nov 4, 2015 8:39:44 AM	configplug
Stop management server	✓	Nov 4, 2015 8:39:45 AM	Nov 4, 2015 8:41:27 AM	emctl.log
Register DLF	✓	Nov 4, 2015 8:41:27 AM	Nov 4, 2015 8:43:38 AM	configplug
Configure Management ...	✓	Nov 4, 2015 8:41:27 AM	Nov 4, 2015 8:45:32 AM	configplug
Configure middle tier	✓	Nov 4, 2015 8:41:27 AM	Nov 4, 2015 8:44:41 AM	configplug
OPSS jazn policy migration	✓	Nov 4, 2015 8:44:42 AM	Nov 4, 2015 8:45:30 AM	configplug
Register metadata	✓	Nov 4, 2015 8:45:32 AM	Nov 4, 2015 8:45:45 AM	configplug
Perform custom postconfi...	✓	Nov 4, 2015 8:45:45 AM	Nov 4, 2015 8:45:45 AM	configplug
Update inventory	✓	Nov 4, 2015 8:45:45 AM	Nov 4, 2015 8:45:49 AM	configplug
Start management server	✓	Nov 4, 2015 8:45:49 AM	Nov 4, 2015 8:53:50 AM	emctl.log

The plug-in is deployed on OMS.

You are now ready to deploy the plug-in on the Management Agent.

Deploy the plug-in on the Management Agent

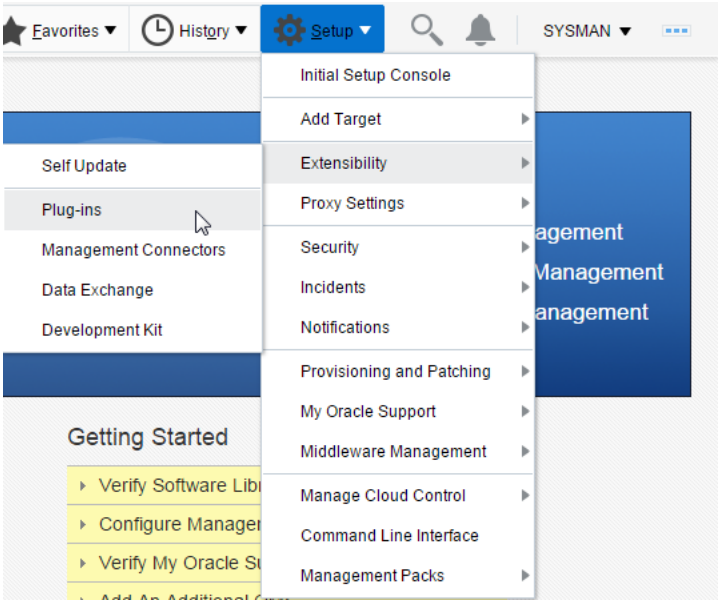
You must deploy the plug-in on OMS before deploying the plug-in on one or more Management Agents.

> **Note:** The TimesTen database, the plug-in, and the agent monitoring the database must be on the same system.

To deploy the plug-in on the Management Agent, ensure that you are on the Oracle Enterprise Manager Cloud Control home page.

1. From the **Setup** menu, select **Extensibility**, then select **Plug-ins**.

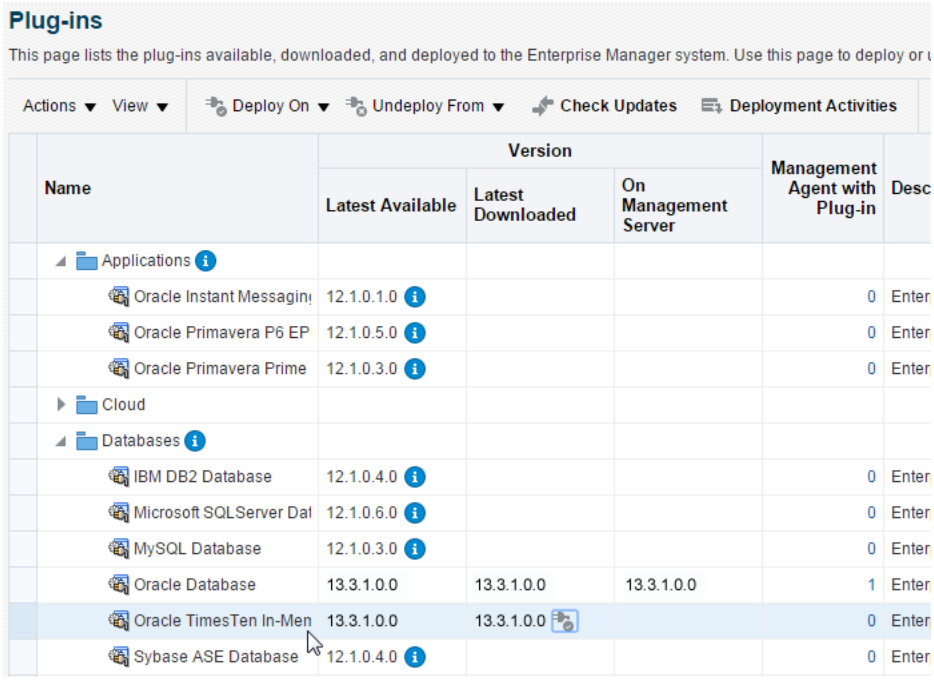
Figure 1–18 Select Extensibility, then Plug-ins



The Plug-ins page displays and you see the plug-ins that have been downloaded and can be deployed. Locate the Databases folder in the Name column.

2. Expand the Databases folder in the Name column and click **Oracle TimesTen In-Memory Database**.

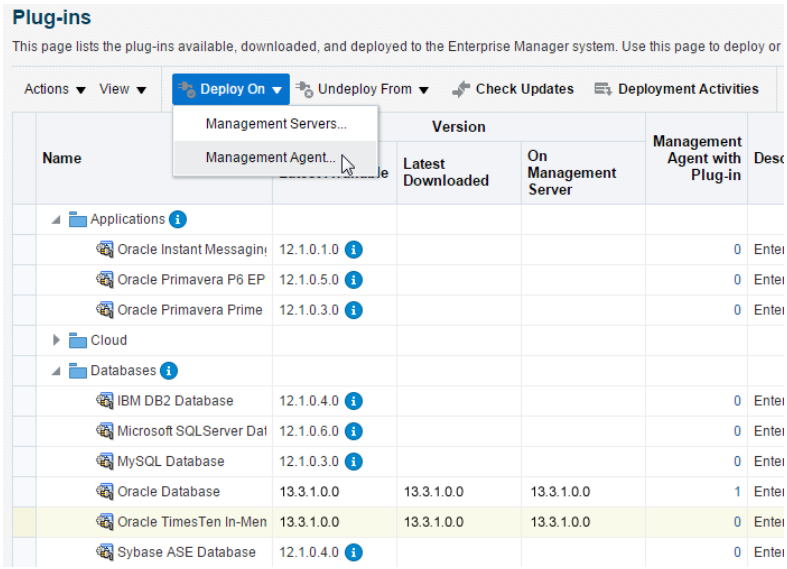
Figure 1–19 Select Oracle TimesTen In-Memory Database plug-in



You are now ready to deploy the plug-in on the Agent. Locate the Deploy On tab at the top of the page.

3. From the **Deploy On** menu, select **Management Agent...**.

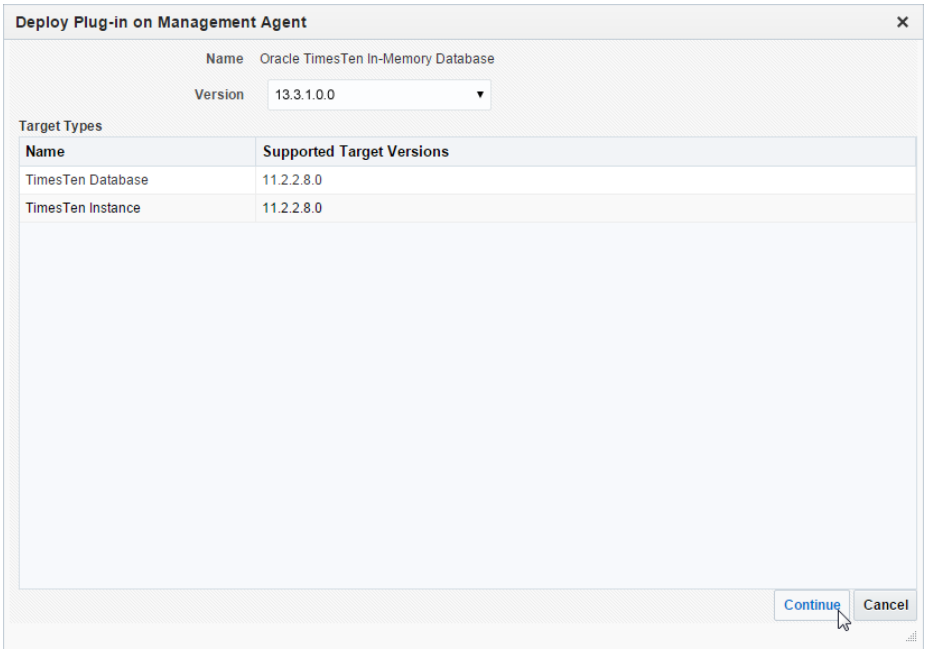
Figure 1–20 Deploy on Management Agent



The Deploy Plug-in on Management Agent General page displays. The plug-in **Oracle TimesTen In-Memory Database** is displayed in the Name column and the Version is auto-filled. The supported target versions column indicates the minimum version of TimesTen that the agent supports. Locate the Continue button below the Target Types table.

4. Click **Continue**.

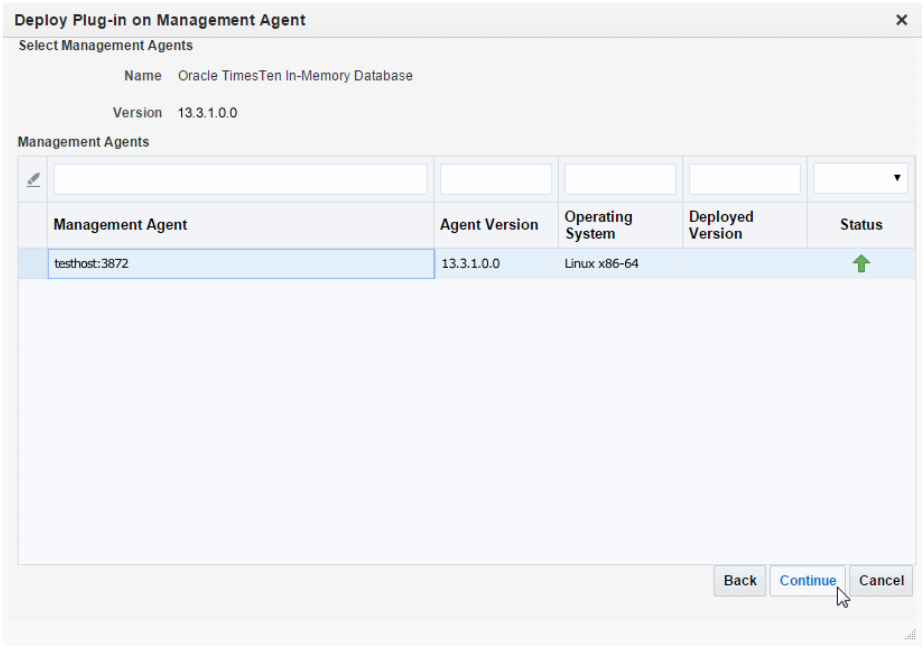
Figure 1–21 Click Continue



You can now select the agent where you want to deploy the plug-in. The agent status must be up as indicated by the green up arrow in the Status column of the Management Agents table.

5. In the Management Agents table, locate the row that contains the correct agent as identified by management agent. Click **in this row** and then click **Continue**.

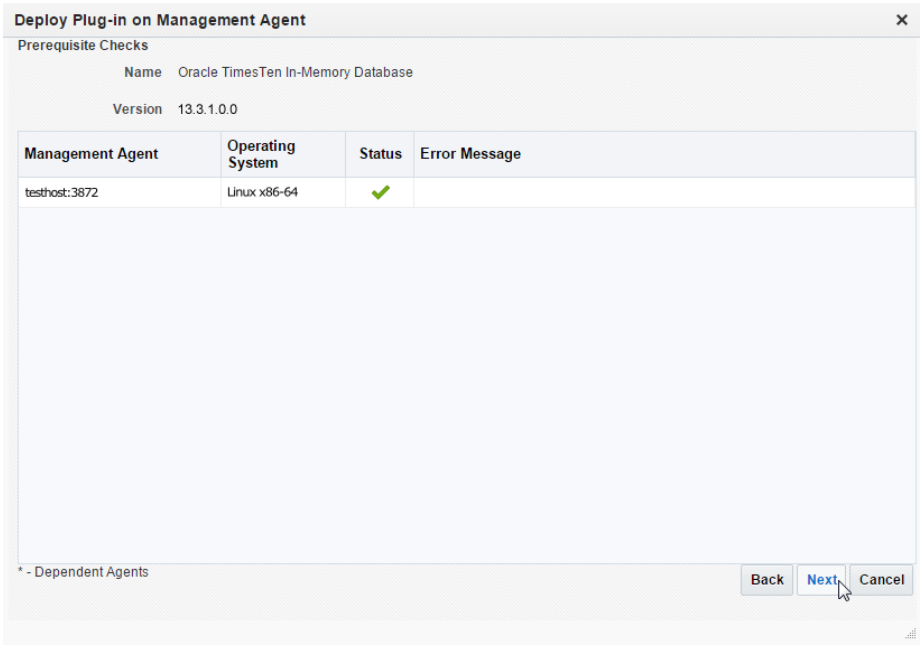
Figure 1–22 Select agent and click Continue



The Deploy Plug-in on Management Agent Prerequisite Checks page displays. In the Management Agent table, verify the Status column has a green check and the Error Message column contains the text "No Error."

6. Click **Next**.

Figure 1–23 Prerequisite checks

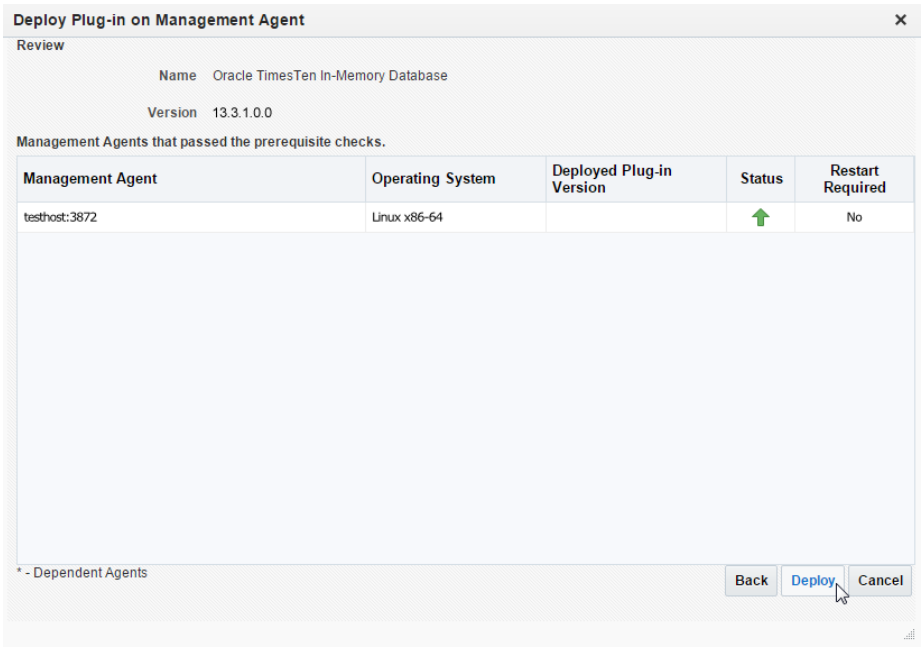


The Deploy Plug-in on Management Agent Review page displays. In the name column, verify the plug-in name is **Oracle TimesTen In-Memory Database** and the version is correct. Ensure that you see the text "Management Agents that passed the prerequisite checks" and ensure that the Management Agent is correct.

You are ready to deploy the plug-in.

7. Click **Deploy**.

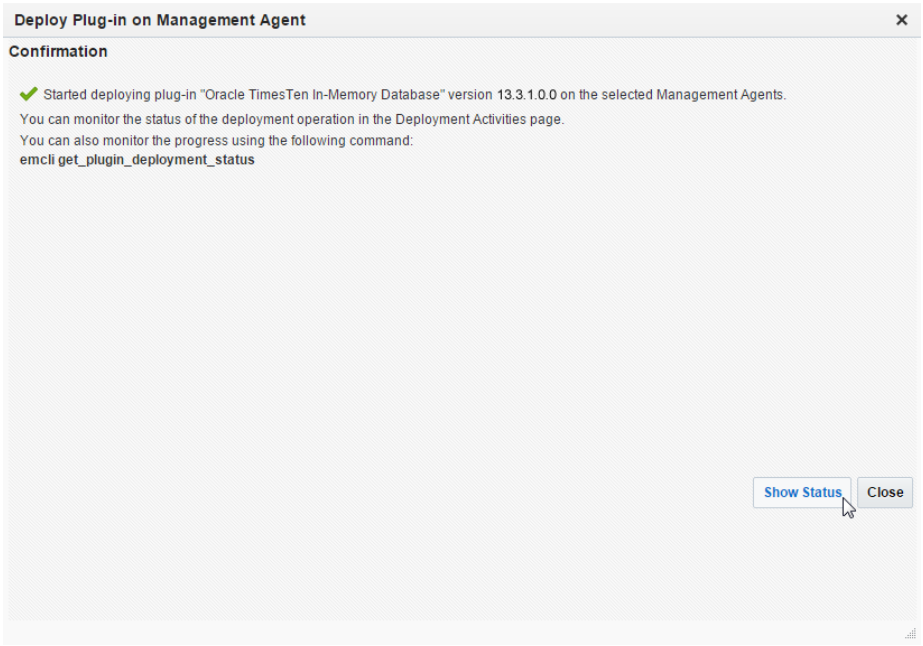
Figure 1–24 Click Deploy



The Deploy Plug-in on Management Agent Confirmation page displays with a message indicating the deployment of the plug-in has started on selected agents. The deployment can take several minutes. You may monitor the deployment status by clicking Show Status or going to the Deployment Activities page.

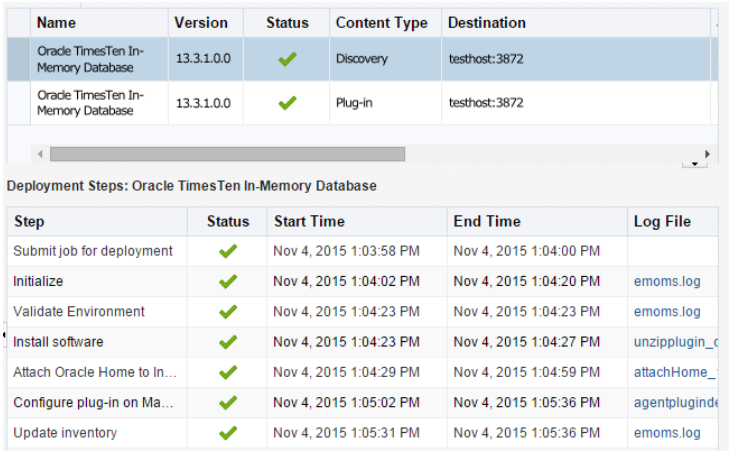
8. Click **Show Status**.

Figure 1–25 Confirmation dialog



The Plug-ins Deployment Activities page displays showing the status of recent deployment activities and a detailed status of the TimesTen deployment steps in table format. The second table on this page, Deployment Steps: Oracle TimesTen In-Memory Database, shows the deployment steps for the TimesTen plug-in. The last step located in the last row of this table is named "Update inventory". Once this step is completed, ensure that there are green checks in the Status column of each row in the Deployment Steps table. Such checks indicate all steps in the deployment process are completed and are successful. If auto refresh is set to off, you may want to set auto refresh to 15 seconds, so you can see the steps as they are completed.

Figure 1–26 Deployment of agent successful



Name	Version	Status	Content Type	Destination
Oracle TimesTen In-Memory Database	13.3.1.0.0	✓	Discovery	testhost:3872
Oracle TimesTen In-Memory Database	13.3.1.0.0	✓	Plug-in	testhost:3872

Deployment Steps: Oracle TimesTen In-Memory Database

Step	Status	Start Time	End Time	Log File
Submit job for deployment	✓	Nov 4, 2015 1:03:58 PM	Nov 4, 2015 1:04:00 PM	
Initialize	✓	Nov 4, 2015 1:04:02 PM	Nov 4, 2015 1:04:20 PM	emoms.log
Validate Environment	✓	Nov 4, 2015 1:04:23 PM	Nov 4, 2015 1:04:23 PM	emoms.log
Install software	✓	Nov 4, 2015 1:04:23 PM	Nov 4, 2015 1:04:27 PM	unzipplugin_c
Attach Oracle Home to In...	✓	Nov 4, 2015 1:04:29 PM	Nov 4, 2015 1:04:59 PM	attachHome_
Configure plug-in on Ma...	✓	Nov 4, 2015 1:05:02 PM	Nov 4, 2015 1:05:36 PM	agentpluginde
Update inventory	✓	Nov 4, 2015 1:05:31 PM	Nov 4, 2015 1:05:36 PM	emoms.log

The plug-in is deployed on the Management Agent and the automatic discovery scripts of the plug-in are deployed on the agent. You can now configure automatic discovery for the TimesTen plug-in, see "Initial automatic discovery configuration" on page 1-18. Repeat steps 1-8 to deploy the plug-in on additional Management Agents.

You are now ready to configure a TimesTen target.

Configure a TimesTen target

You must configure a TimesTen target that is monitored by Enterprise Manager Cloud Control. You can configure a TimesTen target for TimesTen instances and each unique TimesTen database with either automatic discovery or manual configuration. When you configure a TimesTen database target, use a Data Manager DSN. Client/server DSNs are not supported. Manual configuration is recommended for advanced users.

Note: You do not need to configure a TimesTen instance target to configure a TimesTen database target.

Note: Ensure that you are logged in as SYSMAN or a user that has add target privileges through an Enterprise Manager role. For more information, see "Defining roles" on page 3-5.

Follow these instructions before using automatic discovery:

- Initial automatic discovery configuration

These are the configuration types:

- Automatic discovery configuration for a TimesTen instance target
- Automatic discovery configuration for a TimesTen database target
- Manual configuration for a TimesTen instance target
- Manual configuration for a TimesTen database target

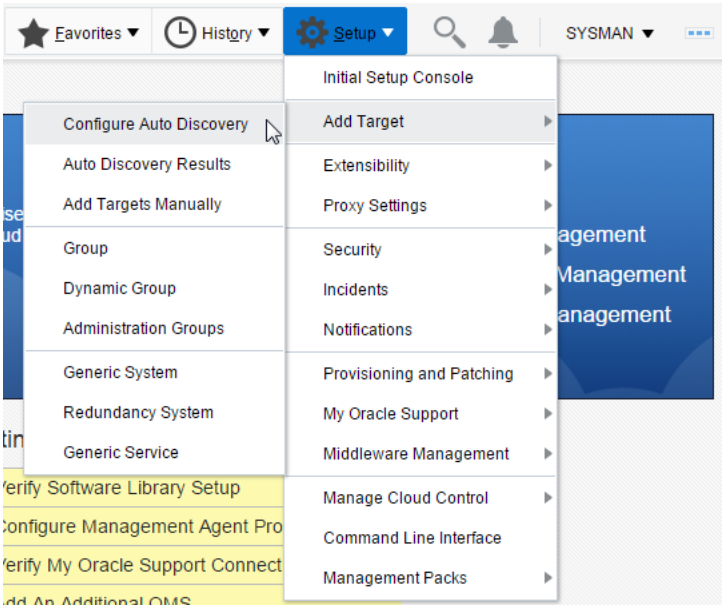
Initial automatic discovery configuration

You must configure each host for automatic discovery before adding a TimesTen instance target or database target through automatic discovery. You do not need to configure automatic discovery if you are adding targets with manual configuration.

For each host that you want to configure for automatic discovery:

1. From the **Setup** menu, select **Add Target**, then select **Configure Auto Discovery**.

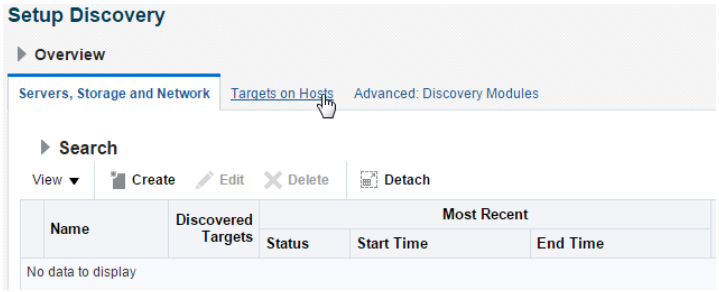
Figure 1–27 Configure auto discovery



The Setup Discovery page displays. Locate the Target on Hosts tab in the Instruction region.

2. Click **Target on Hosts**.

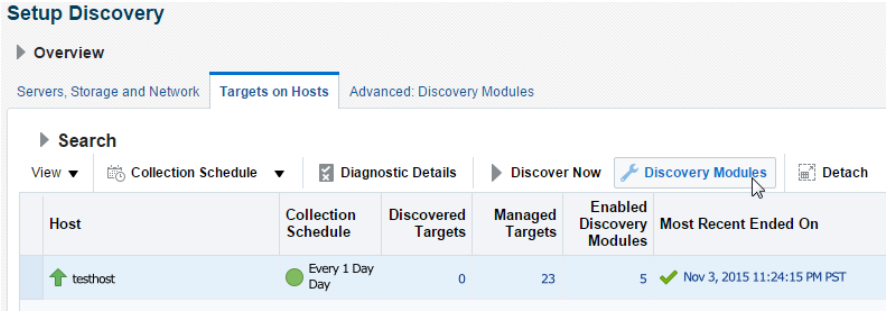
Figure 1–28 Configure auto discovery on host



The Setup Discovery page reloads. You can now select the host where the agent is located. The agent status must be up as indicated by the green up arrow in the Agent Host Name column of the Search table.

3. In the Search table, locate the row that contains the correct agent host. Click **in this row** and then click **Discovery Modules**.

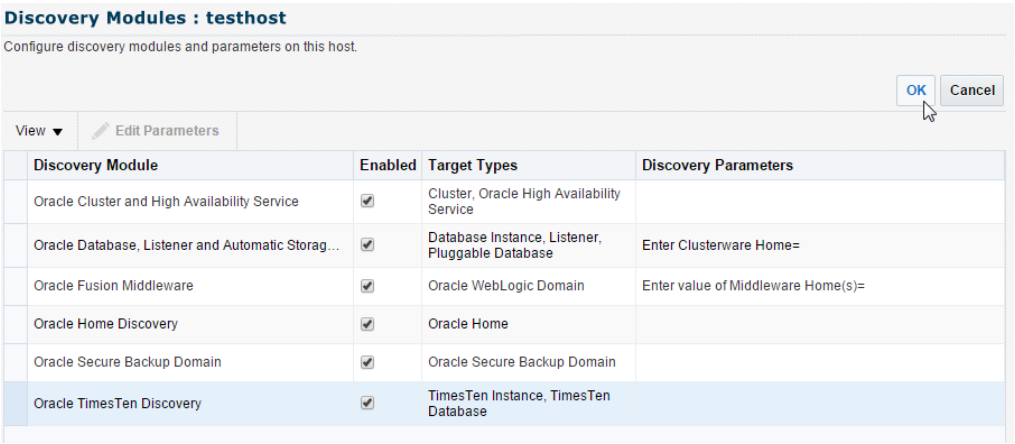
Figure 1–29 Add host



The Discovery Modules page for your host displays. You can now enable the Oracle TimesTen discovery module.

4. In the Discovery Modules table, locate the row that contains the Oracle TimesTen Discovery module. Click **in the check box of the Enable column of this row** and then click **OK**.

Figure 1–30 Select discovery module

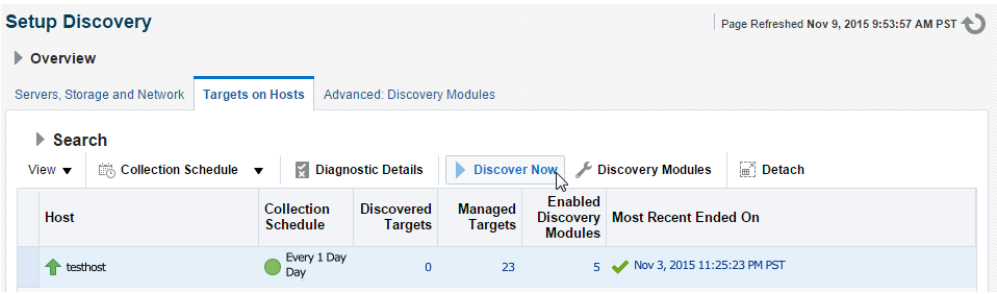


The Setup Discovery page displays. Repeat steps 1-4 to configure additional hosts for automatic discovery.

You are now ready to discover TimesTen targets on your configured hosts.

5. In the Search table, locate the row that contains the correct agent host. Click **in this row** and then click **Discover Now**.

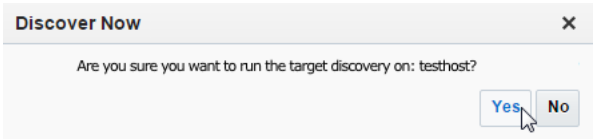
Figure 1–31 Discover Now



The Discover Now dialog displays. Locate the Yes button.

6. Click **Yes**.

Figure 1–32 Run Discovery Now



The Discover Now - Confirmation dialog displays. The discovery can take several minutes. You should see the informational message: "Discover Now - Completed Successfully". Locate the Close button.

7. Click **Close**.

The Setup Discovery page displays. Enterprise Manager has discovered all the targets on your host. Repeat steps 5-7 to discover targets on additional hosts.

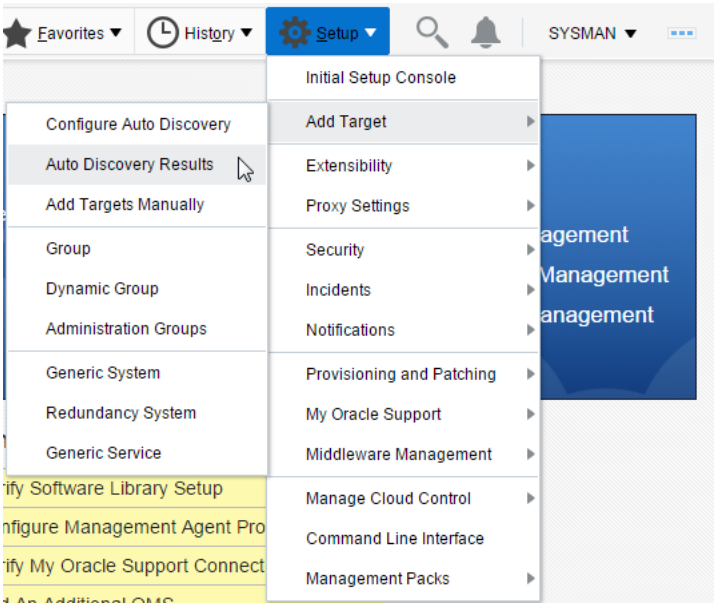
You are now ready to configure TimesTen targets with automatic discovery.

Automatic discovery configuration for a TimesTen instance target

Ensure that you have followed the steps described in "Initial automatic discovery configuration" on page 1-18 before you configure a TimesTen instance target with automatic discovery. For each TimesTen instance target you want to configure with automatic discovery:

1. From the **Setup** menu, select **Add Target**, then select **Auto Discovery Results**.

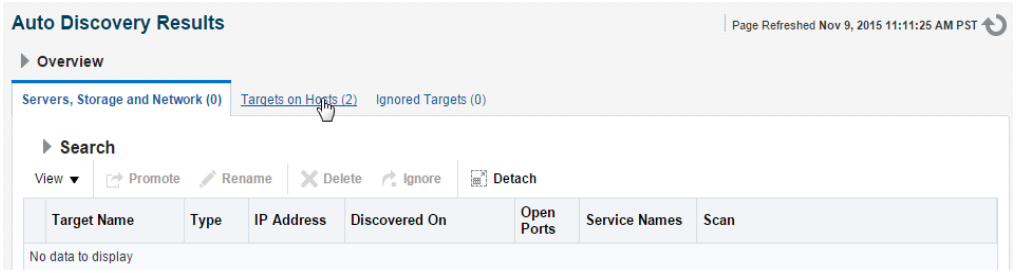
Figure 1–33 Auto Discovery Results



The Auto Discovery Results page displays. Locate the Target on Hosts tab in the Instruction region.

2. Click **Target on Hosts**.

Figure 1–34 Click target on hosts

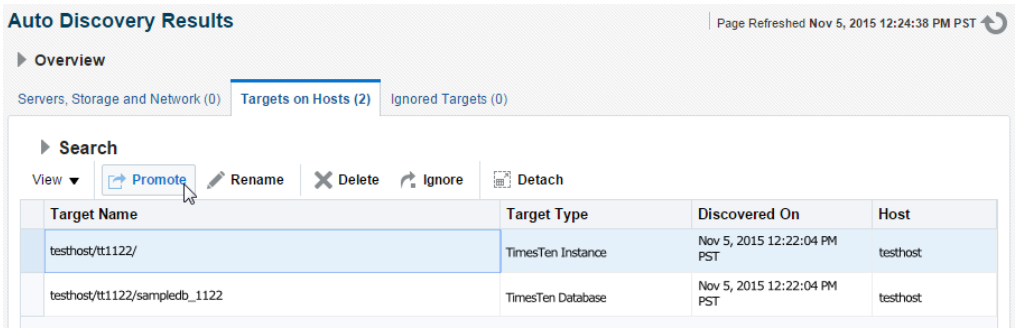


The Auto Discovery Results page reloads. In the Target Type column, locate TimesTen Instance.

3. In the Targets table, locate the row that contains the correct TimesTen instance as identified by the Target Name and Target Type column. Click **in this row** and then click **Promote**.

> **Note:** To change the name of a target, select your TimesTen Instance target and click the **Rename** button. Once you promote a target you cannot change the target name.

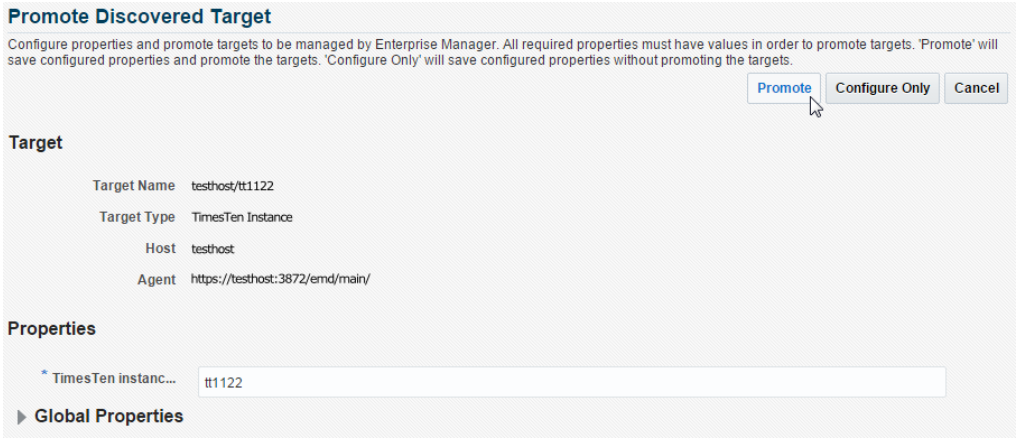
Figure 1–35 Promote target



The Promote Discovered Target page displays. Notice the Target Name, Target Type, and Agent text fields, located below the page title, are auto-filled and cannot be edited. The TimesTen instance name field, located in the Properties region, is auto-filled and is editable.

4. Ensure that the TimesTen instance name is correct and click **Promote**.

Figure 1–36 Promote discovered target



The Confirmation dialog displays. The target promotion can take several minutes. You should see the informational message: "Promote target - Completed Successfully". Locate the Close button.

5. Click **Close**.

   Your TimesTen instance target has been successfully added.

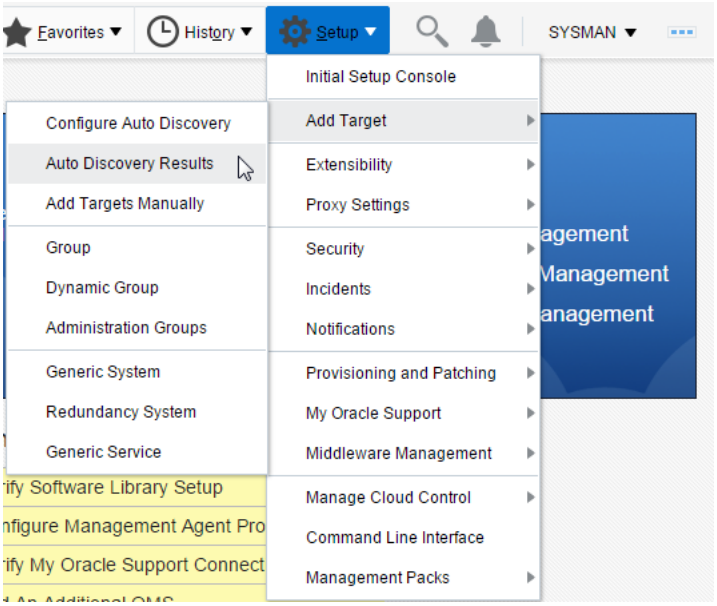
You can now verify and view information about your new target. For more information, see "Verifying and validating the plug-in" on page 1-34.

Automatic discovery configuration for a TimesTen database target

Ensure that you have followed the steps described in "Initial automatic discovery configuration" on page 1-18 before you configure a TimesTen database target with automatic discovery. For each TimesTen database target you want to configure with automatic discovery:

1. From the **Setup** menu, select **Add Target**, then select **Auto Discovery Results**.

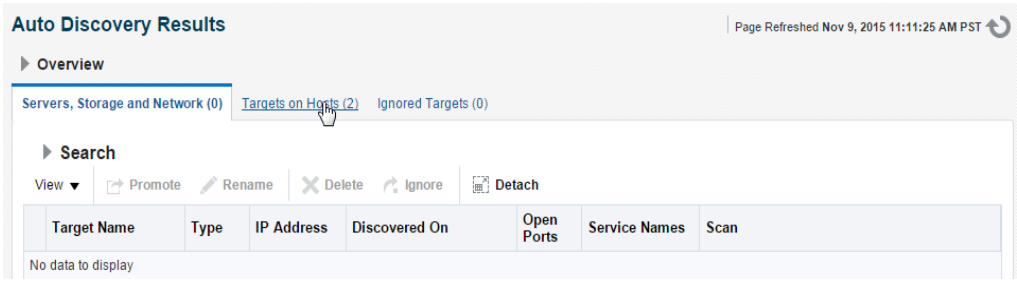
Figure 1–37 Auto Discovery Results



The Auto Discovery Results page displays. Locate the Target on Hosts tab in the Instruction region.

2. Click **Target on Hosts**.

Figure 1–38 Click target on hosts

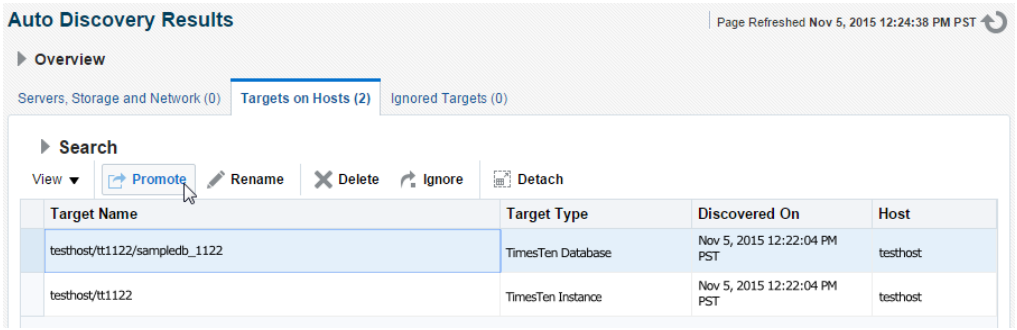


The Auto Discovery Results page reloads. In the Target Type column, locate TimesTen Database.

3. In the Targets table, locate the row that contains the correct TimesTen database as identified by the Target Name and Target Type column. Click **in this row** and then click **Promote**.

> **Note:** To change the name of a target, select your TimesTen Database target and click the **Rename** button. Once you promote a target you cannot change the target name.

Figure 1–39 Promote target



The Promote Discovered Target page displays. Notice the Target Name, Target Type, Agent text, and Credential Type fields, located below the page title, are auto-filled and cannot be edited. You are now ready to enter the TimesTen monitoring credentials properties.

4. In the ***TimesTen database user name** text field, type the TimesTen database user who has `ADMIN` privileges. Note: This user cannot be the TimesTen instance administrator.

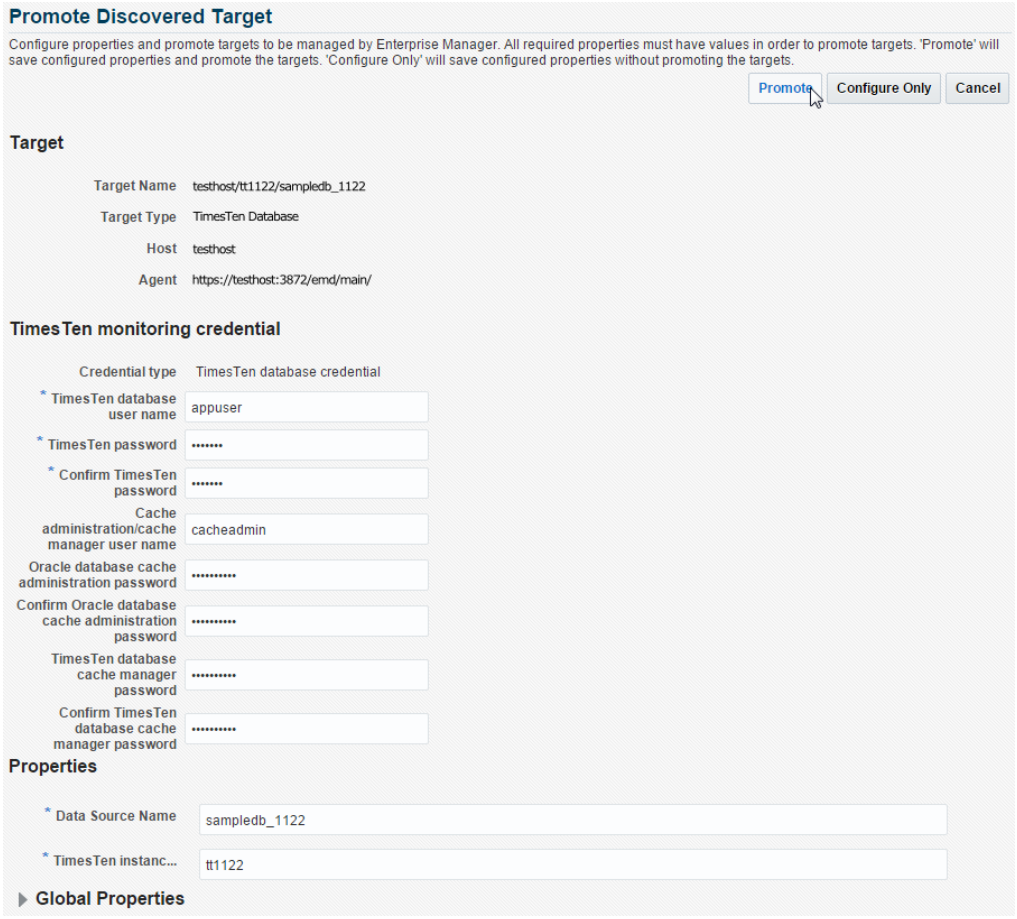
5. In the ***TimesTen password** text field, type the password for the TimesTen database user.

6. In the ***Confirm TimesTen password** text field, re-type the password.

Note: Steps 7-11 are only required if your database uses TimesTen cache features that you want to monitor. If you do not want to monitor TimesTen cache features, skip to step 12. For more information on TimesTen cache, see *Oracle TimesTen Application-Tier Database Cache User's Guide*.

7. Type the TimesTen cache manager user in the **Cache administration/cache manager user name** text field. Note: This user must exist on the TimesTen database and the Oracle database.
8. Type the Oracle database cache manager user password in the **Oracle database cache administration password** text field.
9. In the **Confirm Oracle database cache administration password** text field, re-type the password.
10. Type the TimesTen cache manager password in the **TimesTen database cache manager password** text field.
11. In the **Confirm TimesTen database cache manager password** text field, re-type the password.
12. The ***Data Source Name** text field is auto-filled. Ensure that the data source name is correct.
13. The ***TimesTen instance name** text field is auto-filled. Ensure that the TimesTen instance name is correct.
14. Click **Promote**.

Figure 1–40 Promote discovered target



The Confirmation dialog displays. The target promotion can take several minutes. You should see the informational message: "Promote target - Completed Successfully". Locate the Close button.

15. Click **Close**.

    Your TimesTen database target has been successfully added.

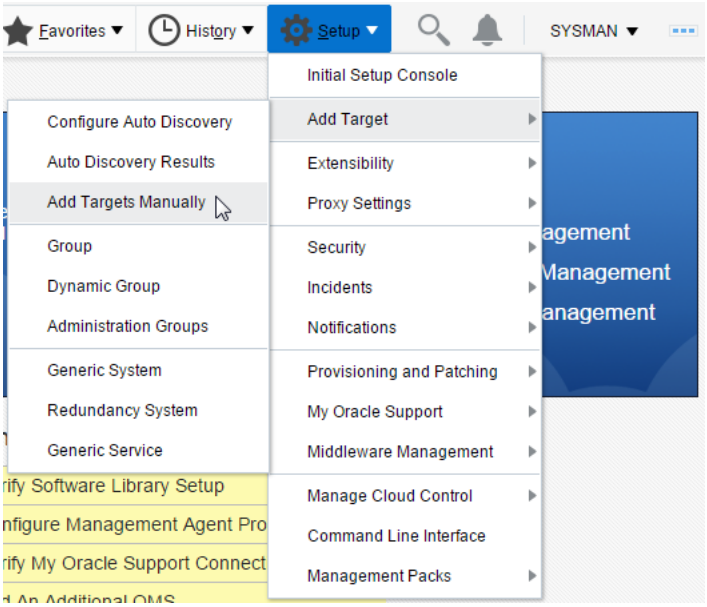
You can now verify and view information about your new target. For more information, see "Verifying and validating the plug-in" on page 1-34.

Manual configuration for a TimesTen instance target

For each TimesTen instance target you want to configure manually:

1. From the **Setup** menu, select **Add Target**, then select **Add Targets Manually**.

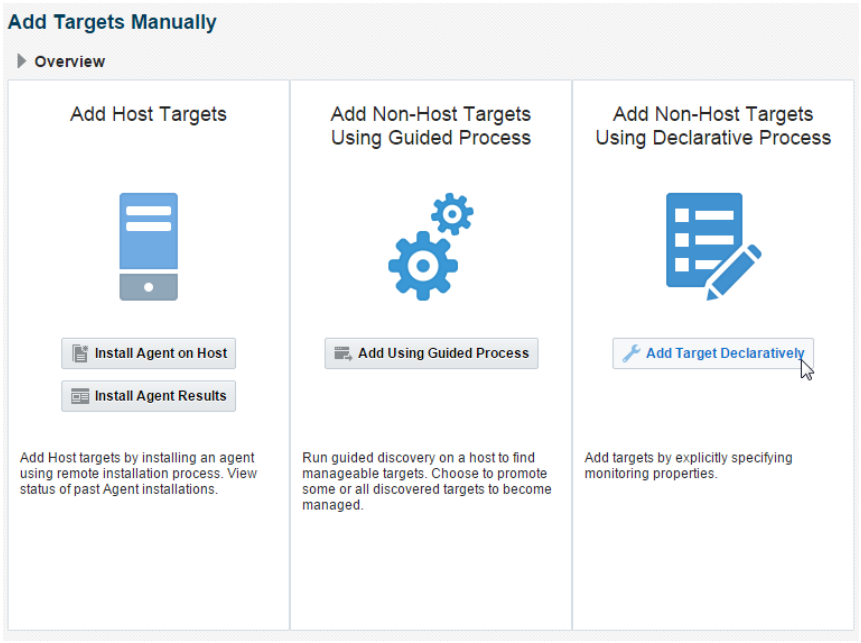
Figure 1–41 Add targets manually



The Add Targets Manually page displays. Locate the Add Targets Declaratively button in the middle right section of the page.

2. Click **Add Targets Declaratively**.

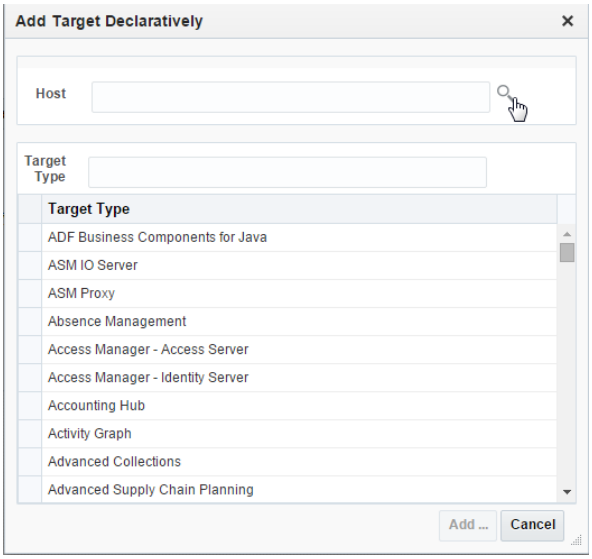
Figure 1–42 Add target declaratively



The Add Target Declaratively dialog displays. You are now ready to select the target host.

3. Click the **Search** icon located to the right of the Host text field.

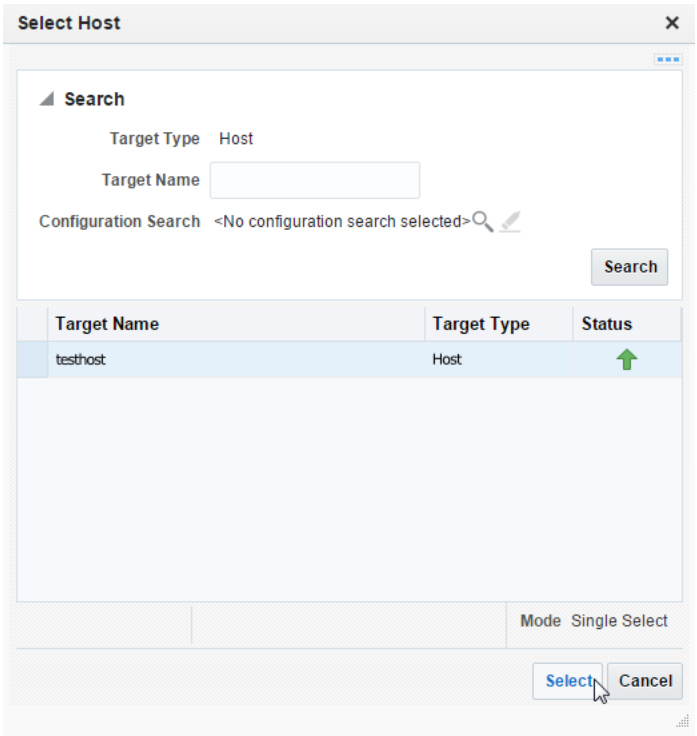
Figure 1–43 Click the search icon



The Select Host dialog displays. You are now ready to select the host of your TimesTen instance target. Locate the Targets table with columns Target Name, Target Type, and Status. Identify the Target Name of your host. Ensure that the Target Type is Host.

4. Click in the row that identifies the **Target Name** of your host and click **Select**.

Figure 1–44 Select host

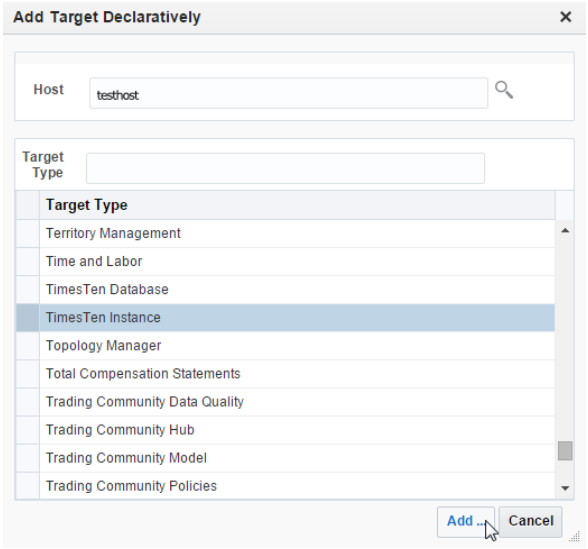


The Select Host dialog closes and you are returned back to the Add Targets Declaratively dialog. Notice the host you selected is auto-filled in the Host text field.

You are now ready to select the target type. Locate the Target Type table.

5. In the Target Type table, select **TimesTen Instance**. Then, click **Add...**.

Figure 1–45 Click add



The Add: TimesTen Instance page displays. Prepare to enter the target properties for your instance target. The first property is the target name.

In the Target Name text field, you define the TimesTen instance target name. Select a name that is a meaningful identifier. (For example, *hostname.instance*.)

6. In the ***Target Name** text field, type the TimesTen target name.

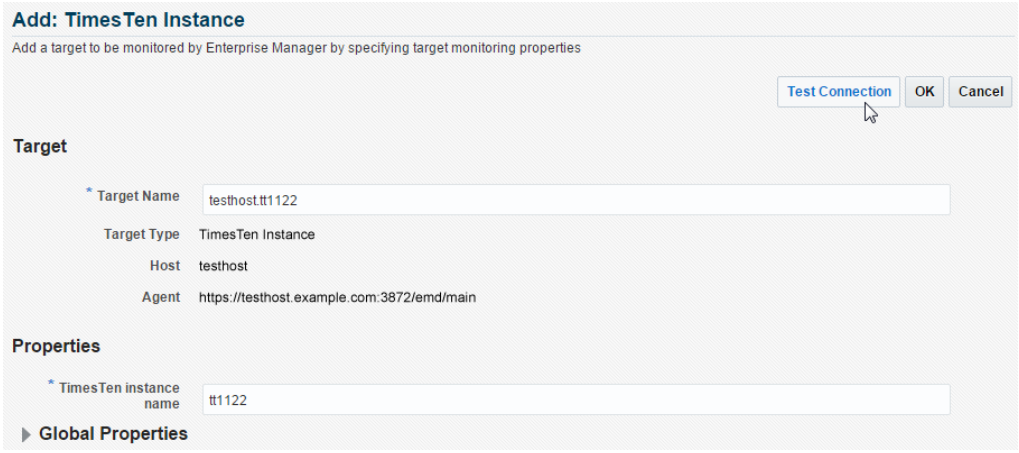
   Notice the Target Type, Host, and Agent text fields, located below the Target Name text field, are auto-filled. You are now ready to enter the TimesTen instance name.

7. In the ***TimesTen instance name** text field, type the name of your TimesTen instance. (Use the `ttStatus` utility if you cannot recall the instance name. For more information, see "ttStatus" in the *Oracle TimesTen In-Memory Database Reference*.)

   You are now ready to test your connection to ensure that your target is deployed successfully and configured properly.

8. Click **Test Connection**.

Figure 1–46 Test connection



The Confirmation dialog displays. You should see the informational message: "Test Connection succeeded." If you do not see the "Test Connection succeeded" message, ensure that your instance name is correct.

9. In the Test Connection dialog, click **Close**.

   The Confirmation dialog closes. Locate the OK button at the top right of the page.

10. Click **OK**.

    A second Confirmation dialog displays. You should see the informational message "Add Target - Completed Successfully." The target type (TimesTen Instance), Target name, and Agent are also displayed.

11. Click **Close**.

    Your TimesTen instance target has been successfully added.

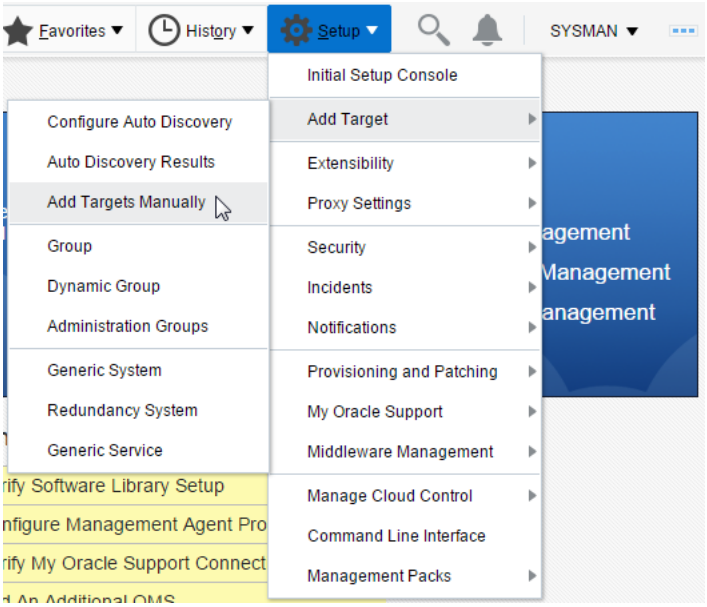
You can now verify and view information about your new target. For more information, see "Verifying and validating the plug-in" on page 1-34.

Manual configuration for a TimesTen database target

For each TimesTen database target you want to configure manually:

1. From the **Setup** menu, select **Add Target**, then select **Add Targets Manually**.

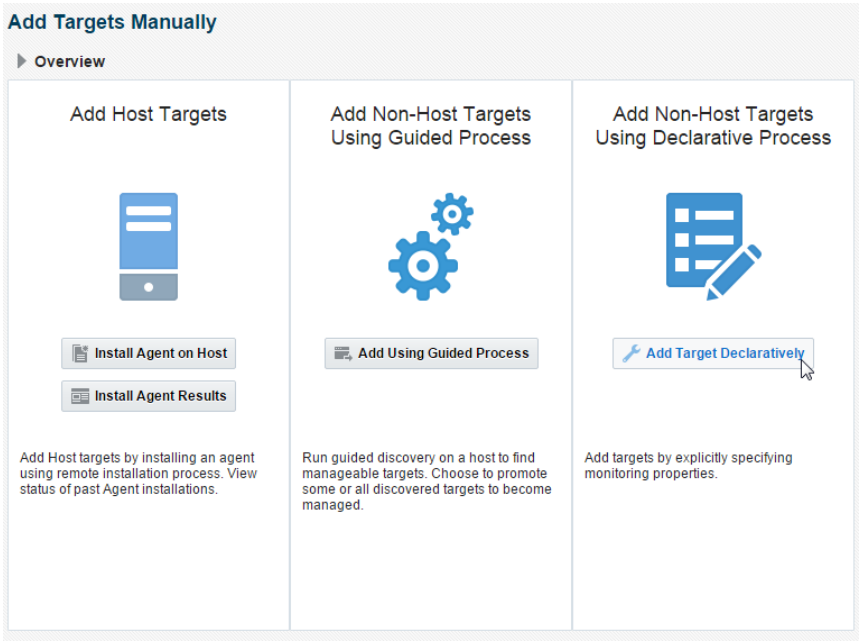
Figure 1–47 Add targets manually



The Add Targets Manually page displays. Locate the Add Targets Declaratively button in the middle right section of the page.

2. Click **Add Targets Declaratively**.

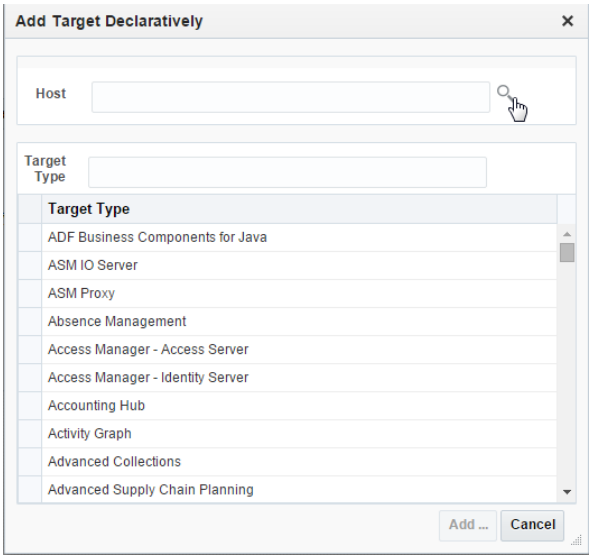
Figure 1–48 Add target declaratively



The Add Target Declaratively dialog displays. You are now ready to select the target host.

3. Click the **Search** icon located to the right of the Host field.

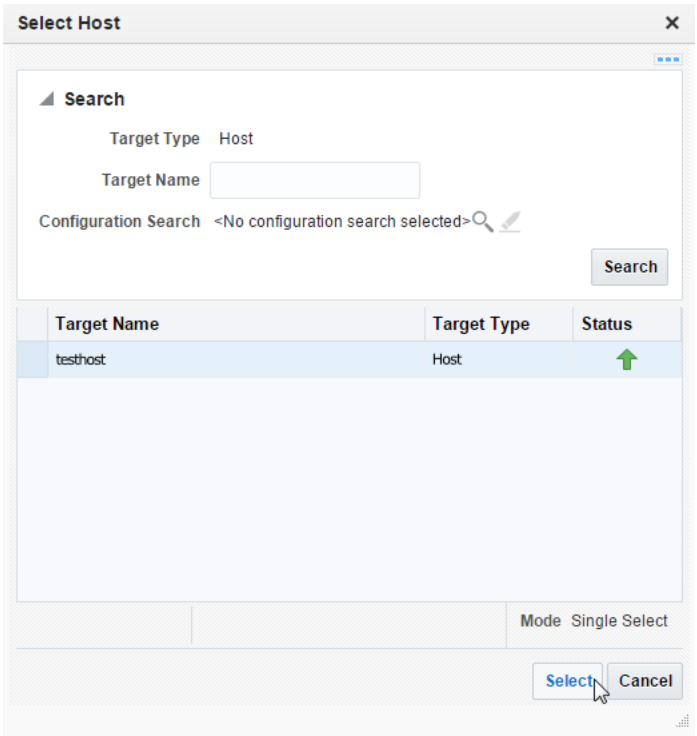
Figure 1–49 Click the search icon



The Select Host dialog displays. You are now ready to select the host of your TimesTen database target. Locate the Targets table with columns Target Name, Target Type, and Status. Identify the Target Name of your host. Ensure that the Target Type is Host.

4. Click in the row that identifies the **Target Name** of your host and click **Select**.

Figure 1–50 Select host

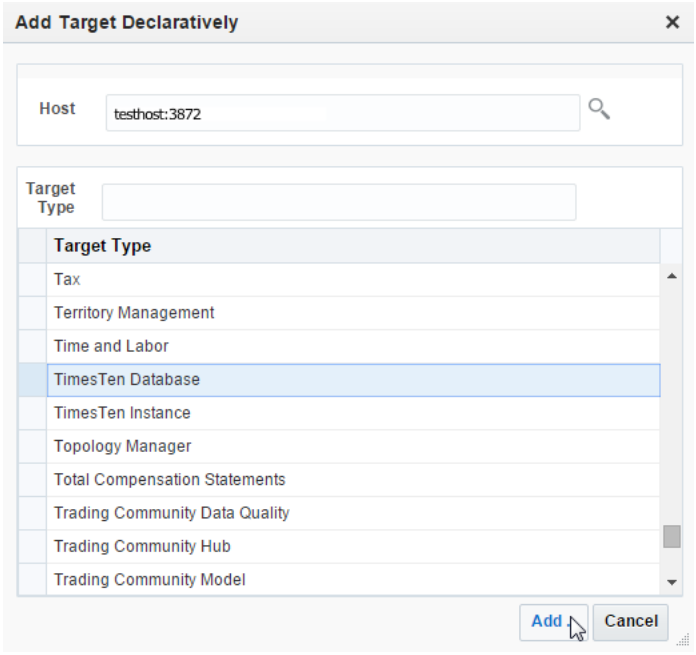


The Select Host dialog closes and you are returned back to the Add Targets Declaratively dialog. Notice the host you selected is auto-filled in the Host text field.

You are now ready to select the target type. Locate the Target Type table.

5. In the Target Type table, select **TimesTen Database**. Then, click **Add...**.

Figure 1–51 Click add



The Add: TimesTen Database page displays. Prepare to enter the target properties for your target. The first property is the target name.

In the Target Name text field, you define the TimesTen target name. Select a name that is a meaningful identifier. (For example, *hostname.instance.DSN*.)

6. In the ***Target Name** text field, type the TimesTen target name.

   Notice the Target Type, Host, Agent, and Credential type text fields, located below the Target Name text field, are auto-filled. You are now ready to enter the TimesTen monitoring credentials properties.

7. In the ***TimesTen database user name** text field, type the TimesTen database user who has `ADMIN` privileges. Note: This user cannot be the TimesTen instance administrator.

8. In the ***TimesTen password** text field, type the password for the TimesTen database user.

9. In the ***Confirm TimesTen password** text field, re-type the password. You are now ready to enter the TimesTen properties.

Note: Steps 10-14 are only required if your database uses TimesTen cache features that you want to monitor. If you do not want to monitor TimesTen cache features, skip to step 15. For more information on TimesTen cache, see *Oracle TimesTen Application-Tier Database Cache User's Guide*.

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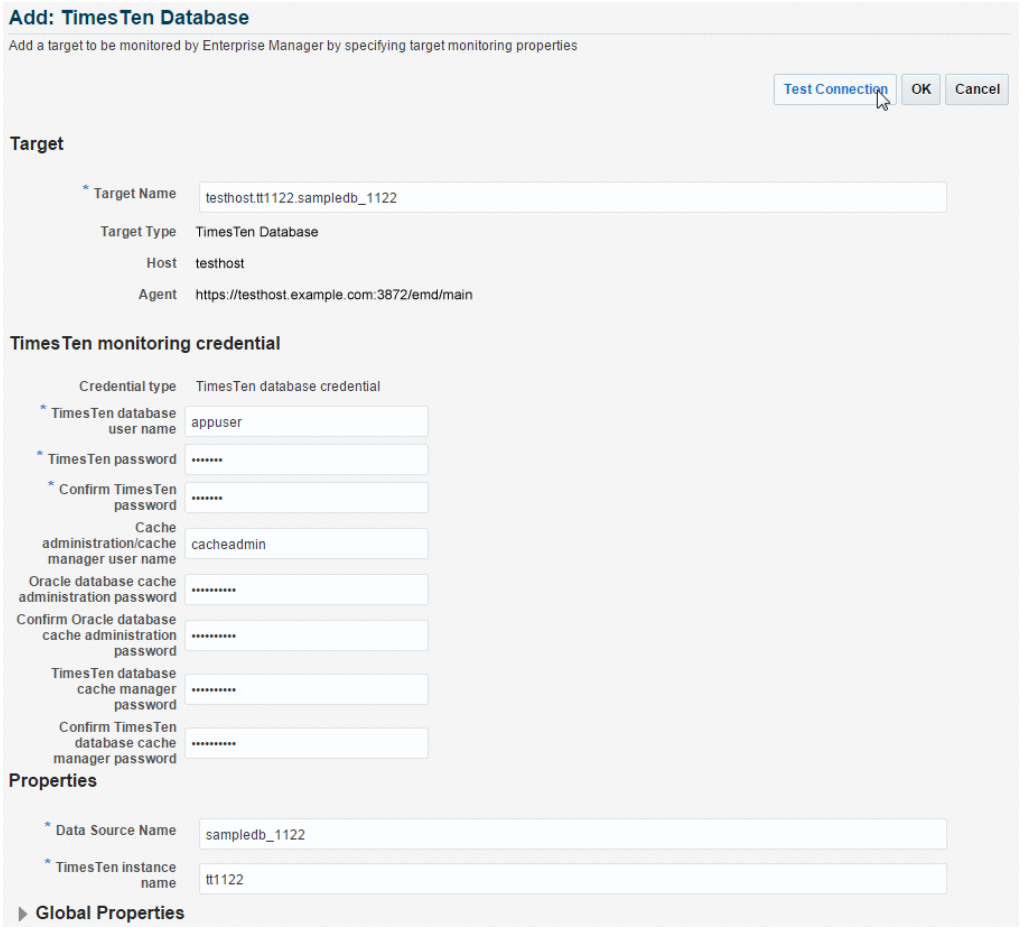
10. Type the TimesTen cache manager user in the **Cache administration/cache manager user name** text field. Note: This user must exist on the TimesTen database and the Oracle database.
11. Type the Oracle database cache manager user password in the **Oracle database cache administration password** text field.
12. In the **Confirm Oracle database cache administration password** text field, re-type the password.
13. Type the TimesTen cache manager password in the **TimesTen database cache manager password** text field.
14. In the **Confirm TimesTen database cache manager password** text field, re-type the password.
15. In the ***Data Source Name** text field, type the DSN. The DSN must be a system DSN that is described in either your `sys.odbc.ini` file or the ODBC Data Source Administrator on Microsoft Windows.
16. In the ***TimesTen instance name** text field, type the name of your TimesTen instance. (Use the `ttStatus` utility if you cannot recall the instance name. For more information, see "ttStatus" in the *Oracle TimesTen In-Memory Database Reference*.)

    You are now ready to test your connection to ensure that your target is deployed successfully and configured properly.
17. Click **Test Connection**.

Figure 1–52 Add TimesTen specific information



The Confirmation dialog displays. You should see the informational message: "Test Connection succeeded." If you do not see the "Test Connection succeeded" message, ensure that your instance name and DSN are correct and the TimesTen database for the DSN is loaded into memory.

18. In the Test Connection dialog, click **Close**.

    The Confirmation dialog closes. Locate the OK tab at the top right of the page.

19. Click **OK**.

    A second Confirmation dialog displays. You should see the informational message "Add Target - Completed Successfully." The target type (TimesTen Database), Target name, and Agent are also displayed.

20. Click **Close**.

    Your TimesTen database target has been successfully added.

You can now verify and view information about your new target. For more information, see "Verifying and validating the plug-in" on page 1-34.

Verifying and validating the plug-in

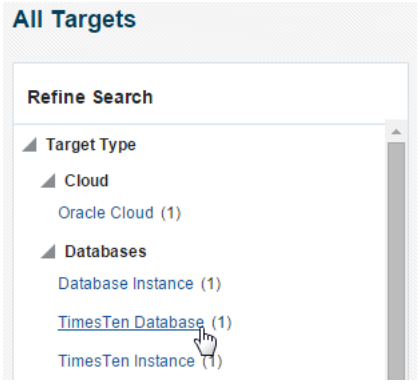
After waiting a few minutes for the plug-in to start collecting data:

1. From the **Targets** menu, select **All Targets** on the Enterprise Manager Cloud Control 13*c* home page.

   The All Targets page displays. Locate the Refine Search panel under **All Targets**.

2. Expand **Target Type**, then **Databases** and click **TimesTen Instance** or **TimesTen Database**.

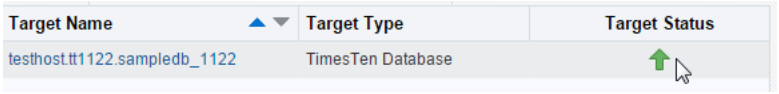
Figure 1–53 Select your TimesTen target



The target table displays. For each row in the table, confirm the column Target Type contains **TimesTen Instance** or **TimesTen Database** and each row of the table contains the name of the target you previously configured. For more information on configuring a TimesTen target, see "Configure a TimesTen target" on page 1-17.

For each target type row, locate the column Target Status. Verify there is a green up arrow indicating the status is Up.

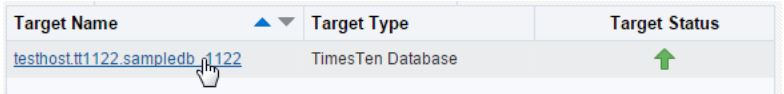
Figure 1–54 Verify the TimesTen target is Up.



You are now ready to verify there are no metric errors.

3. In the target table, locate the row that contains your TimesTen target. In the column Target Name, click the **Target Name**. (The target name is the name of the TimesTen target you configured).

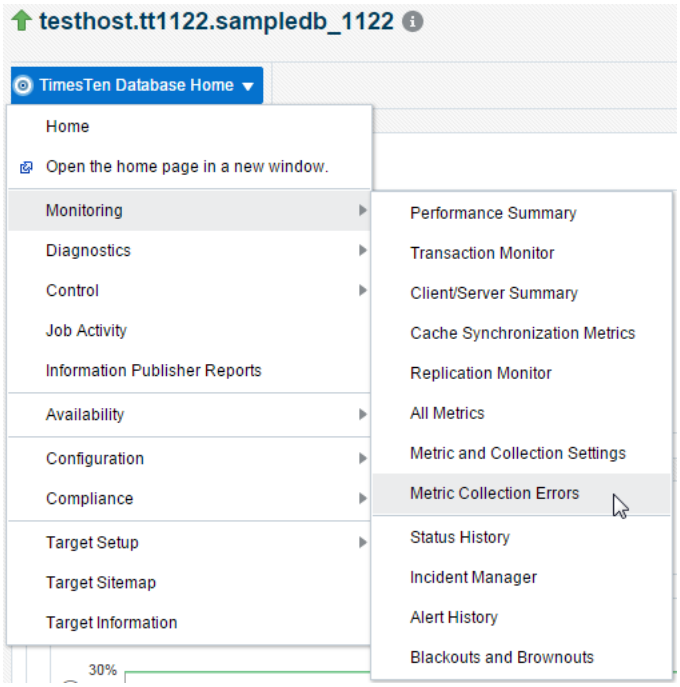
Figure 1–55 Click the target name



The TimesTen target page displays.

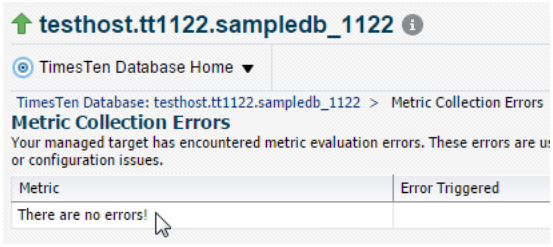
4. From the **TimesTen Database Home** menu, select **Monitoring**, then select **Metric Collection Errors**.

Figure 1–56 Select Metric Collection Errors



The Metric Collection Errors page displays a table with metric collection error information. Verify the first column named Metrics contains the text "There are no errors!".

Figure 1–57 No errors



You are now ready to set preferred credentials for your target.

Setting preferred credentials for a target

Set preferred credentials for a TimesTen target to:

- Start and stop the TimesTen daemon of a TimesTen instance.
- Use the transaction monitor of a TimesTen database.
- Create backups of a TimesTen database.
- Start and stop the TimesTen cache agent of a TimesTen database.
- Start and Stop the TimesTen replication agent of a TimesTen database.
- Load and unload a TimesTen database from memory.

For more information on the transaction monitor, see "Working with the Transaction Monitor" on page 7-1.

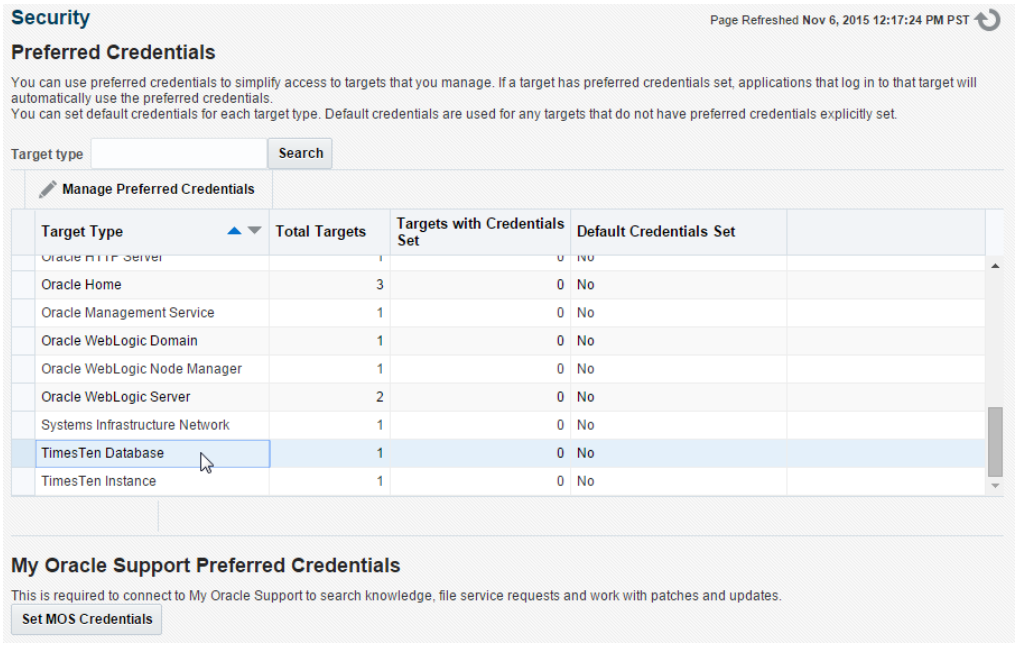
To set the preferred credentials for a target:

1. Ensure that you are on the Enterprise Manager Cloud Control home page. From the **Setup** menu, select **Security**, then select **Preferred Credentials**.

   The Security Preferred Credentials page displays. Locate TimesTen Instance or TimesTen Database in the Target Type column.

2. Click **TimesTen Instance** or **TimesTen Database**.

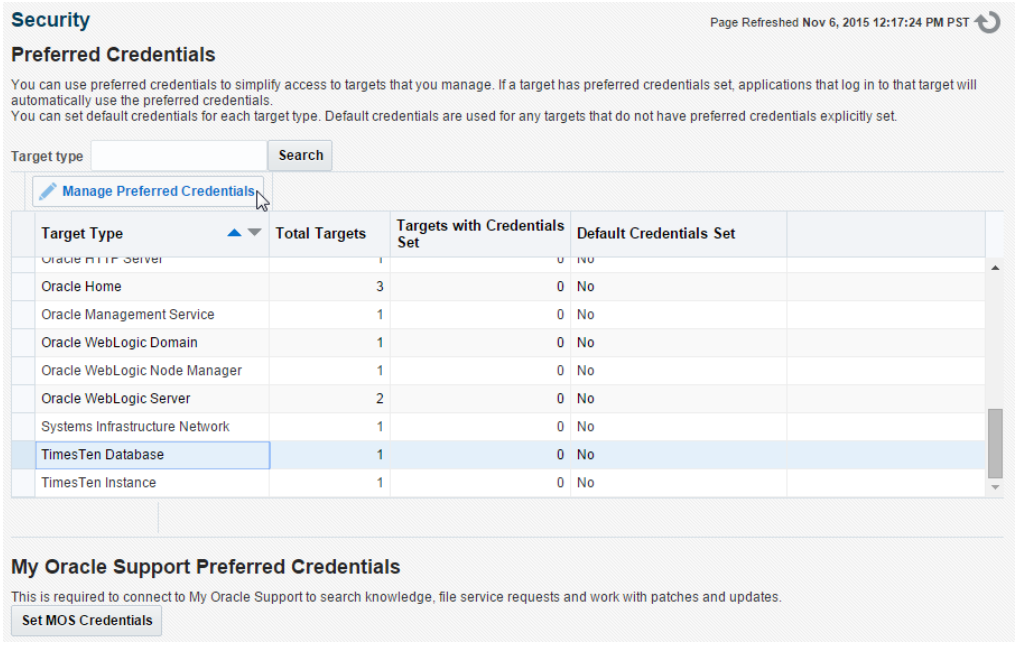
Figure 1–58 Preferred Credentials Page



   You are now ready to set the preferred credentials for your TimesTen target. Locate the Manage Preferred Credentials button.

3. Click **Manage Preferred Credentials**.

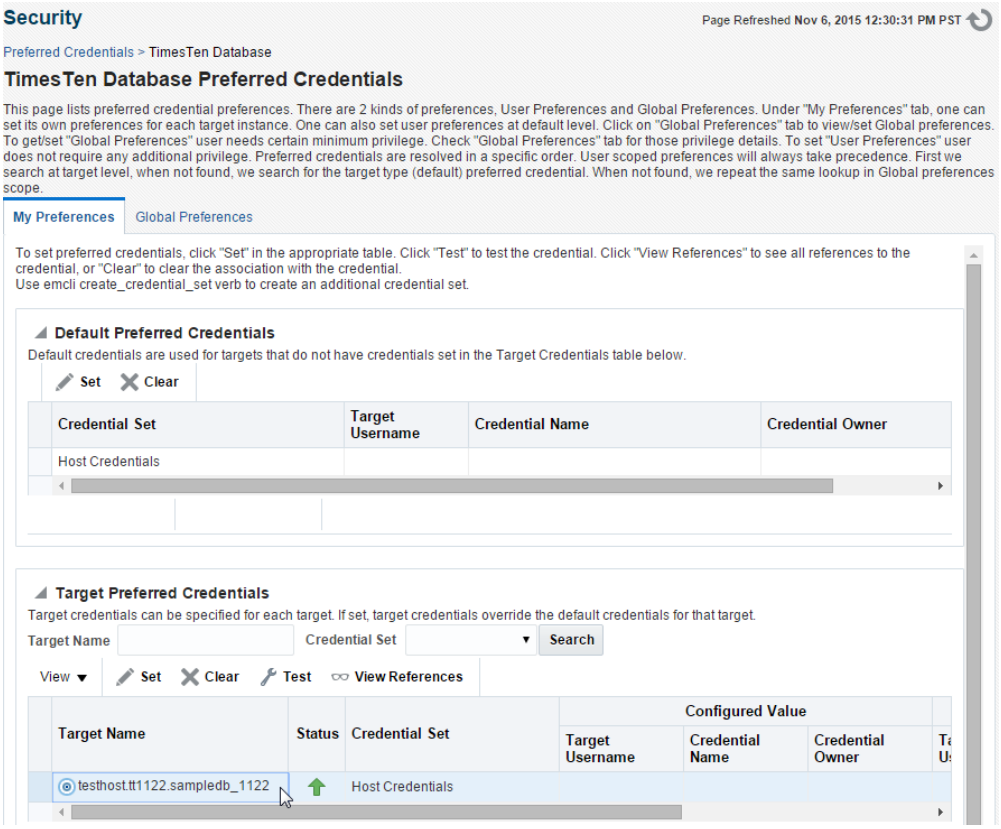
Figure 1–59 Click Manage Preferred Credentials



Depending on your selection, the TimesTen Instance Preferred Credentials or TimesTen Database Preferred Credentials page displays.

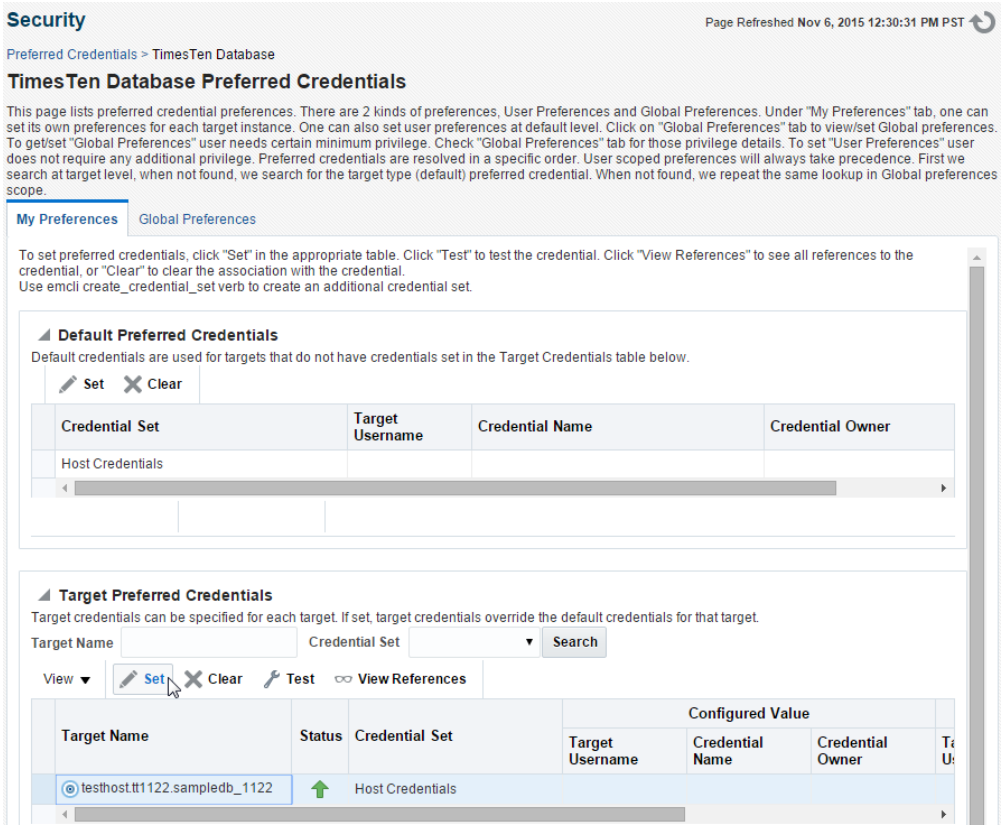
4. In the Target Preferred Credentials table, locate the row that contains your TimesTen target. In the column Target Name, click the **Target Name**. (The target name is the name of the TimesTen target you configured.)

Figure 1–60 Click the target name



5. Click **Set**.

Figure 1–61 Click set

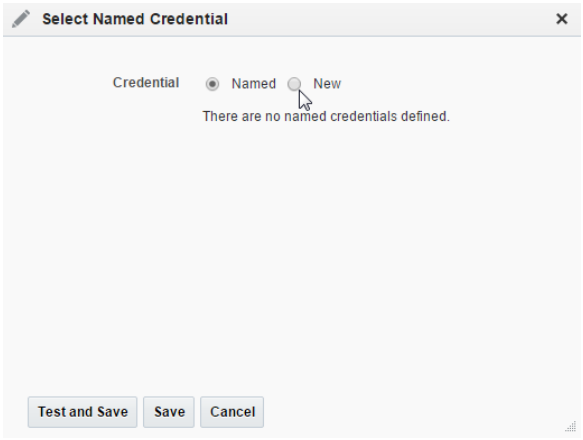


The Select Named Credentials dialog displays.

6. Click in the circle to the left of the text **New**.

> **Note:** If you already have a named credential, select it and skip to step 12.

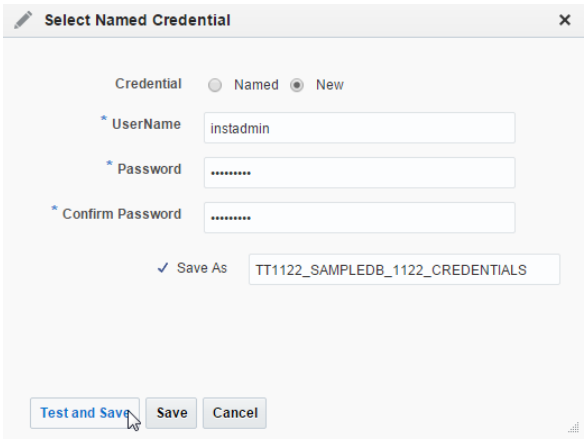
Figure 1–62 Select Named Credential page



The Select Named credential dialog refreshes. You are now required to enter the preferred credentials for your TimesTen target. The first property is the UserName.

7. In the ***UserName** text field, type the user who has access to the target host. The username must be the operating system username of the TimesTen instance administrator.
8. In the ***Password** text field, type the password for the user who has access to the target host. The password must be the operating system password of the TimesTen instance administrator.
9. In the ***Confirm password** text field, re-type the password.
10. Click in the check box to the left of the text **Save As**.
11. In the **Save As** text field, type the name you want to use for the preferred credentials. The credentials are saved with this name.
12. Click **Test and Save**.

Figure 1–63 Click Test and Save



The information dialog displays with the text "Named credential association completed successfully".

You have successfully associated the credential with your TimesTen target.

Changing the monitoring configuration of a TimesTen database target

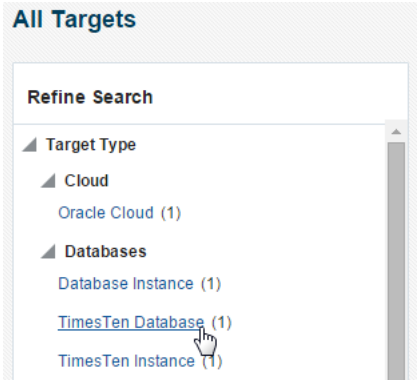
When you configure your TimesTen database target, you specify the TimesTen username and password. If you change the password for this TimesTen user in the TimesTen database, you must update the password in the Enterprise Manager Cloud Control monitoring configuration. For more information on configuring your TimesTen target, see "Configure a TimesTen target" on page 1-17.

To change the monitoring configuration of your TimesTen database target:

1. Ensure that you are on the Enterprise Manager Cloud Control home page. From the **Targets** menu, select **All Targets** on the Enterprise Manager Cloud Control 13*c* home page.

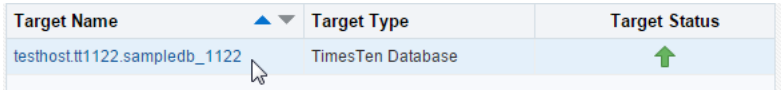
   The All Targets page displays. Locate the Refine Search panel under **All Targets**.
2. Expand **Target Type**, then **Databases** and click **TimesTen Instance** or **TimesTen Database**.

Figure 1–64 Select database target type



Locate the row that contains the target name.

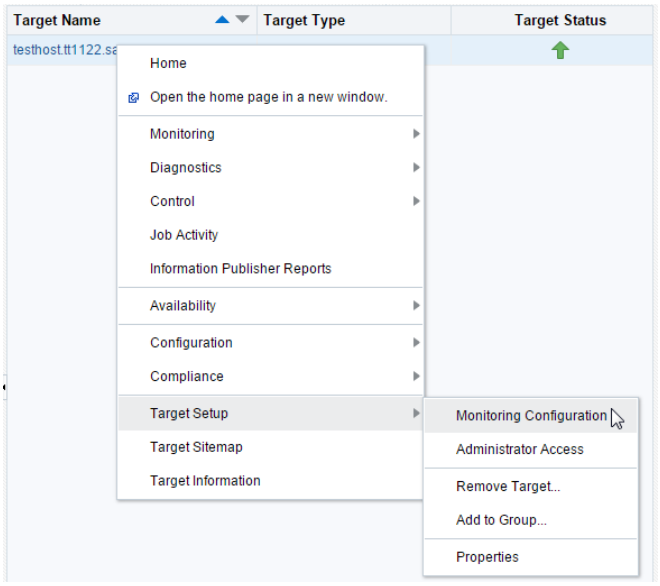
Figure 1–65 Locate the TimesTen target



You are now ready to update the password.

3. Right-click the **Target Name** located in the Target Name column of the row containing the TimesTen target and select **Target Setup**, then **Monitoring Configuration**.

Figure 1–66 Change the monitoring configuration



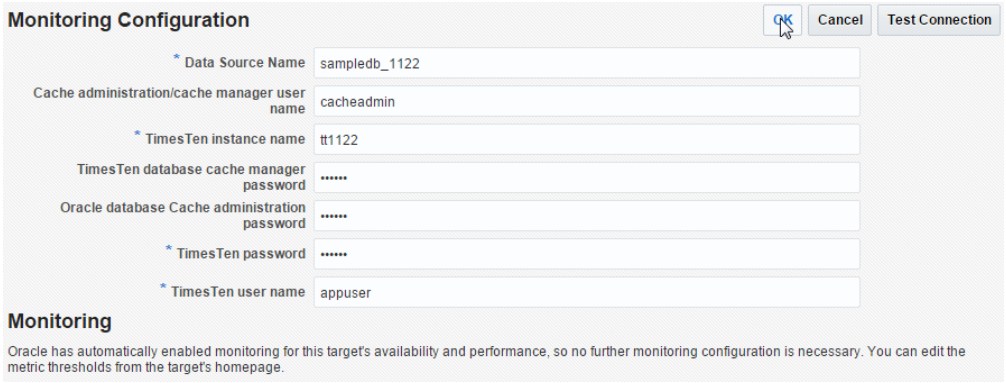
The target monitoring configuration page displays. The Data Source Name, the TimesTen instance name, and the TimesTen username are auto-filled. If you have the TimesTen cache feature configured, the Cache admin password and the Cache admin user name text fields are auto-filled.

4. In the **TimesTen password** text field, type the new password. This password must be the same password that exists in the TimesTen database for your TimesTen user.

For example, if the TimesTen user name is *appuser*, and in the TimesTen database, you modified the TimesTen password for *appuser* to be *newpassword*, then in the TimesTen password field, type *newpassword*. For more information on changing a password in the TimesTen database, see "ALTER USER" in the *Oracle TimesTen In-Memory Database SQL Reference*.

5. Click **OK**.

Figure 1–67 Click OK



The Saved Successfully dialog displays indicating the settings are saved correctly in the repository.

6. In the Saved Successfully dialog, click **OK**.

The Saved Successfully dialog closes.

You can verify the new monitoring configuration of your target. For more information on verifying a TimesTen target, see "Verifying and validating the plug-in" on page 1-34.

Upgrading the Enterprise Manager Plug-in for TimesTen

You can upgrade the plug-in from version 12.1.0.3.0 or 13.1.1.0.0 to version 13.3.1.0.0. Upgrading the plug-in enables you to use the new features of the new plug-in while still keeping all of the metrics that the previous plug-in has collected.

Before upgrading, ensure that you have Oracle Enterprise Manager Cloud Control 13*c* Release 1 (or higher). For more information on upgrading to Oracle Enterprise Manager Cloud Control 13*c*, see the *Oracle Enterprise Manager Cloud Control Upgrade Guide*.

Note: If you perform these operations while performing an upgrade, your Management Agent automatically upgrades to version 13.3.1.0.0:

- Adding new TimesTen targets to Management Agents.
- Testing connection when modifying the monitoring configuration of an existing TimesTen target. For more information, see "Changing the monitoring configuration of a TimesTen database target" on page 1-41.

To upgrade the plug-in from version 12.1.0.3.0 or 13.1.1.0.0 to version 13.3.1.0.0:

1. Download the 13.3.1.0.0 plug-in. For more information, see "Download the plug-in" on page 1-3.

2. Deploy the 13.3.1.0.0 plug-in on the Management Server. For more information, see "Deploy the plug-in on Oracle Management Service" on page 1-6.
3. Deploy the 13.3.1.0.0 plug-in on the Management Agent. For more information, see "Deploy the plug-in on the Management Agent" on page 1-12. It is recommended to complete this step after with step 2.

You have successfully upgraded the TimesTen plug-in from version 12.1.0.3.0 or 13.1.1.0.0 to version 13.3.1.0.0. You do not need to modify any of your TimesTen target settings.

Uninstalling the Enterprise Manager Plug-in for TimesTen

You must remove all TimesTen targets before you can undeploy the plug-in. For example, if you have three TimesTen targets and two targets are deployed to one agent and the third target is deployed to a second agent, you must:

- Remove target 1 on agent 1.
- Remove target 2 on agent 1.
- Remove target 3 on agent 2.

You then undeploy and delete the plug-in from the Oracle Enterprise Manager Cloud Control.

To uninstall the Enterprise Manager Plug-in for TimesTen:

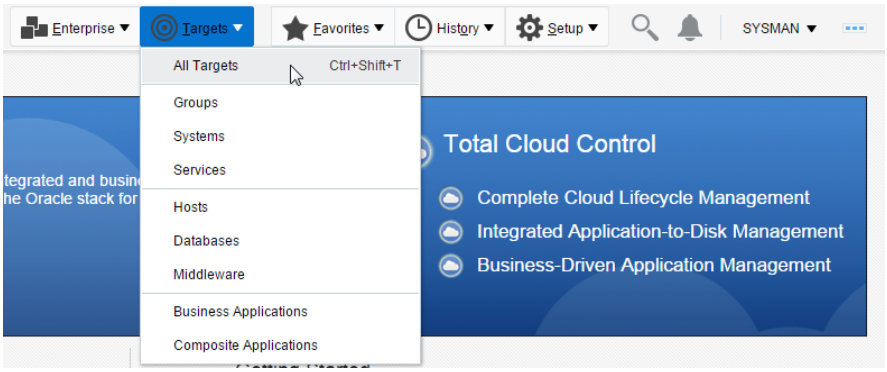
- Remove the TimesTen target
- Undeploy the plug-in from the Management Agent
- Undeploy the plug-in from OMS
- Delete the plug-in

Remove the TimesTen target

For each TimesTen target you want to remove:

1. From the **Targets** menu, select **All Targets** on the Enterprise Manager Cloud Control home page.

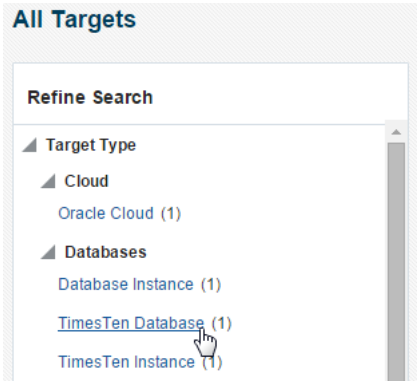
Figure 1–68 Select All Targets



The All Targets page displays. Locate the Refine Search panel under the text "All Targets."

2. Expand **Target Type**, then **Databases** and click **TimesTen Instance** or **TimesTen Database**.

Figure 1–69 Select TimesTen In Memory Database

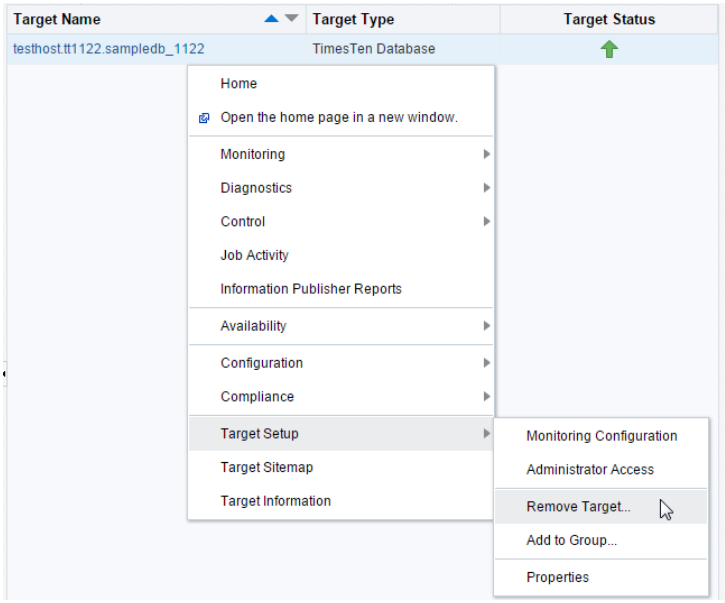


The target table displays. For each row in the table, confirm the column Target Type is **TimesTen Instance** or **TimesTen Database**. Also, confirm each row of the table contains the name of the target you previously configured.

Locate the row that contains the target name you want to remove.

3. Right-click the **Target Name** located in the Target Name column of the row containing the TimesTen target and select **Target Setup**, then **Remove Target...**

Figure 1–70 Remove target

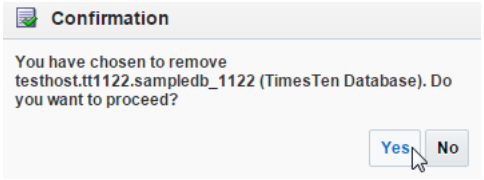


The Confirmation dialog displays the text "You have chosen to remove *TimesTen_target_name* (TimesTen Instance). Do you want to proceed?" or "You have chosen to remove *TimesTen_target_name* (TimesTen Database). Do you want to proceed?"

The *TimesTen_target_name* is the name of your TimesTen target. For example, `testhost.tt1122.sampledb_1122`.

4. Click **Yes**.

Figure 1–71 Remove target confirmation dialog



The Information dialog displays the text "Target *TimesTen_target_name* (TimesTen Instance) has been deleted" or "Target *TimesTen_target_name* (TimesTen Database) has been deleted" where *TimesTen_target_name* is the name of your TimesTen target.

5. Click **OK**.

   Verify the row that contained the TimesTen target has been removed from the target table.

Your TimesTen target is removed. Repeat Steps 1-5 to remove additional targets. If all targets are removed, you can undeploy and then delete the plug-in from the Oracle Enterprise Manager Cloud Control.

Undeploy the plug-in from the Management Agent

You must undeploy the plug-in from all the Management Agents that are monitoring TimesTen targets.

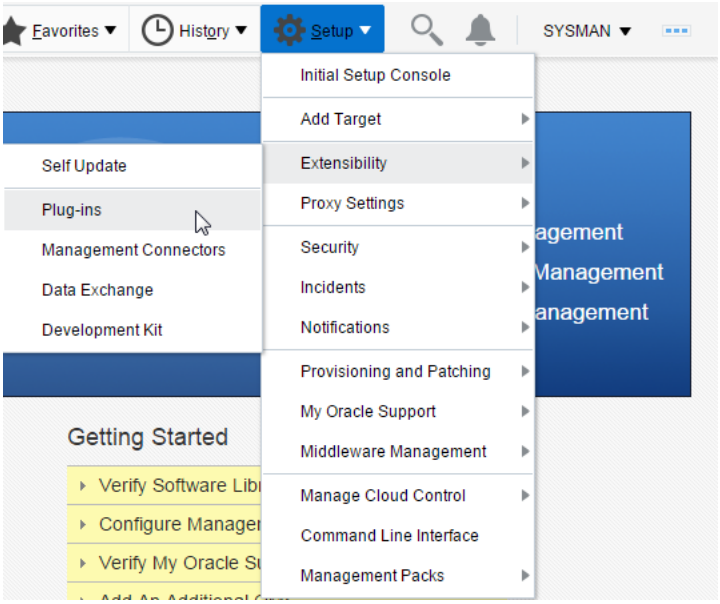
Note: Undeploy the plug-in from the Management Agents before you undeploy the plug-in from the Oracle Management Service (OMS).

Ensure that you have removed all TimesTen targets. For more information on the steps to remove a TimesTen target, see "Remove the TimesTen target" on page 1-44.

To undeploy the plug-in from the Management Agent, ensure that you are on the Oracle Enterprise Manager Cloud Control home page.

1. From the **Setup** menu, select **Extensibility**, then select **Plug-ins**.

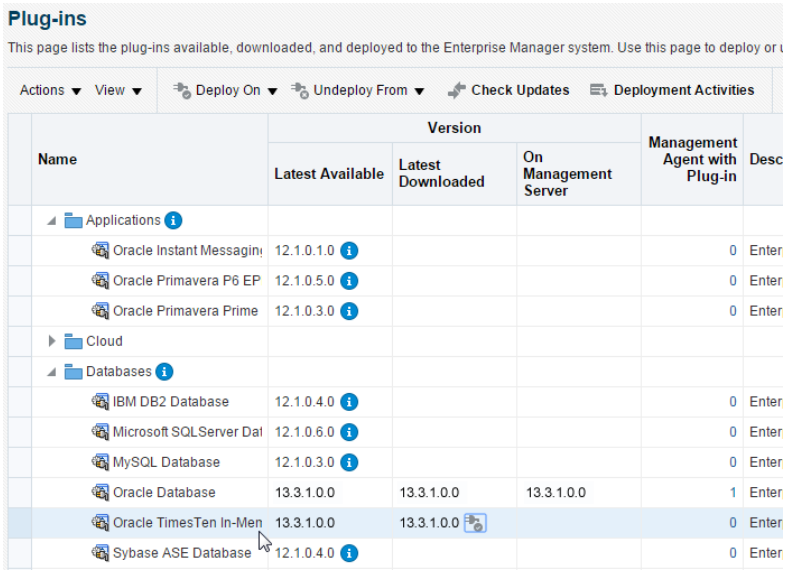
Figure 1–72 Select Extensibility, then Plug-ins



The Plug-ins page displays and shows the Plug-ins table. Locate the Databases folder in the **Name** column.

2. Expand the Databases folder in the Name column and click **Oracle TimesTen In-Memory Database**.

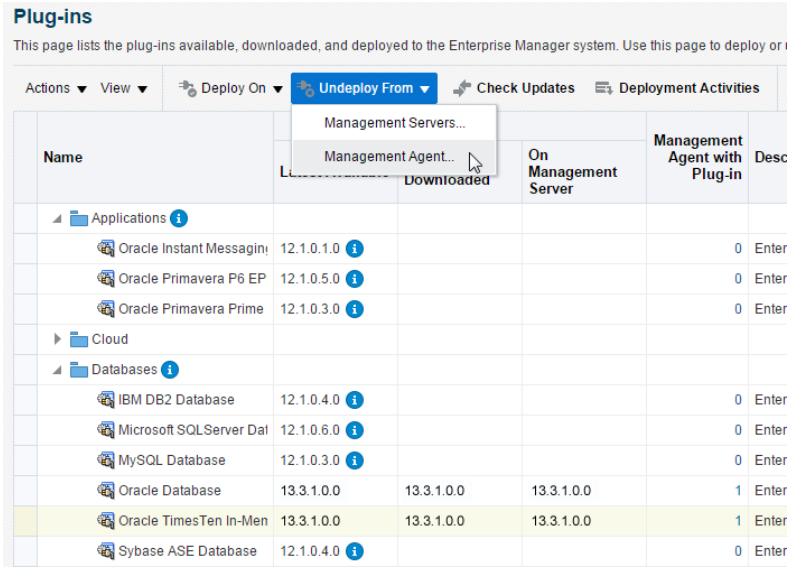
Figure 1–73 Select Oracle TimesTen In-Memory Database plug-in



You are now ready to undeploy the plug-in from the agent. Locate the Undeploy From tab at the top of the page.

3. From the **Undeploy From** menu, select **Management Agent...**.

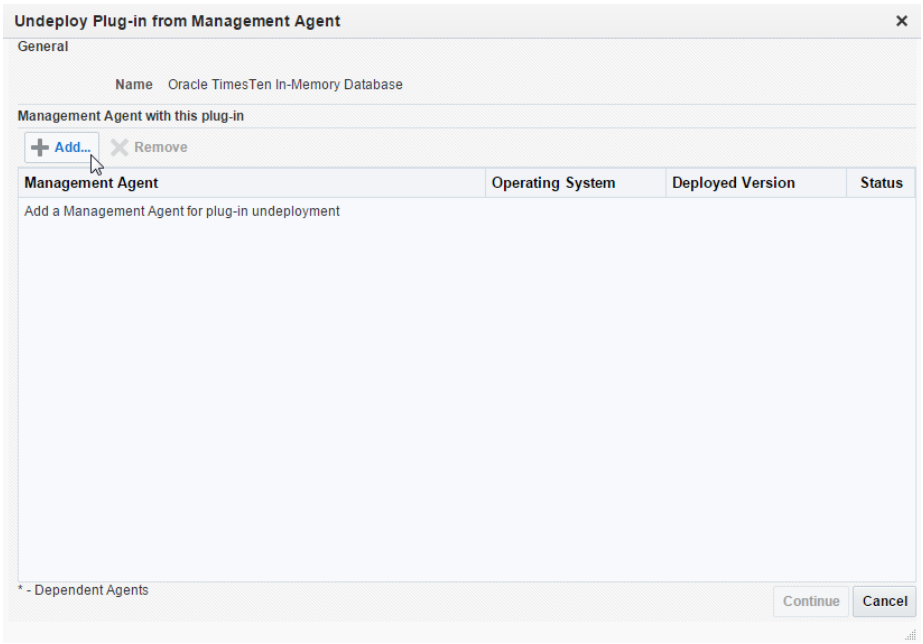
Figure 1–74 Undeploy from Management Agent



The Undeploy Plug-in from Management Agent General dialog displays. The plug-in Oracle TimesTen In-Memory Database is displayed in the Name column. Locate the Add... button below the Management Agent with this plug-in title.

4. Click **Add...**

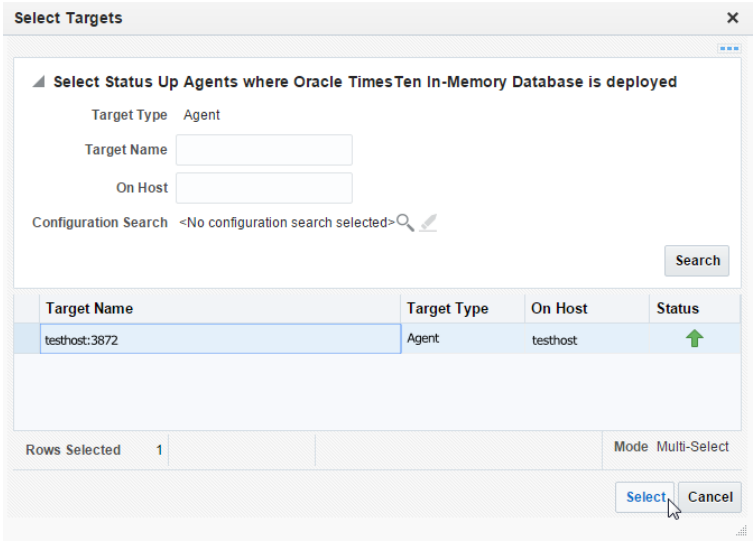
Figure 1–75 Click Add



The Select Targets dialog displays. You are now ready to select the agent to undeploy. Below the text "Select Status Up Agents where TimesTen In-Memory Database is deployed," ensure that the Target Type column equals **Agent**.

5. In the Target table, locate the row that contains the correct agent as identified by target name and host. Click **in this row** and then click **Select**.

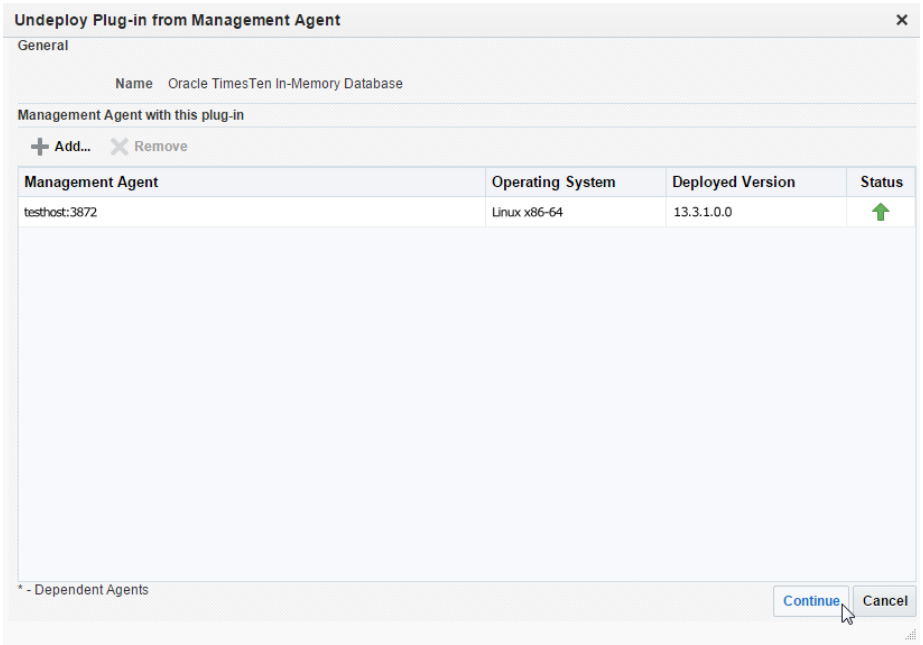
Figure 1–76 Select agent to undeploy



The Management Agent table is updated with the name of the Management Agent you selected.

6. Click **Continue**.

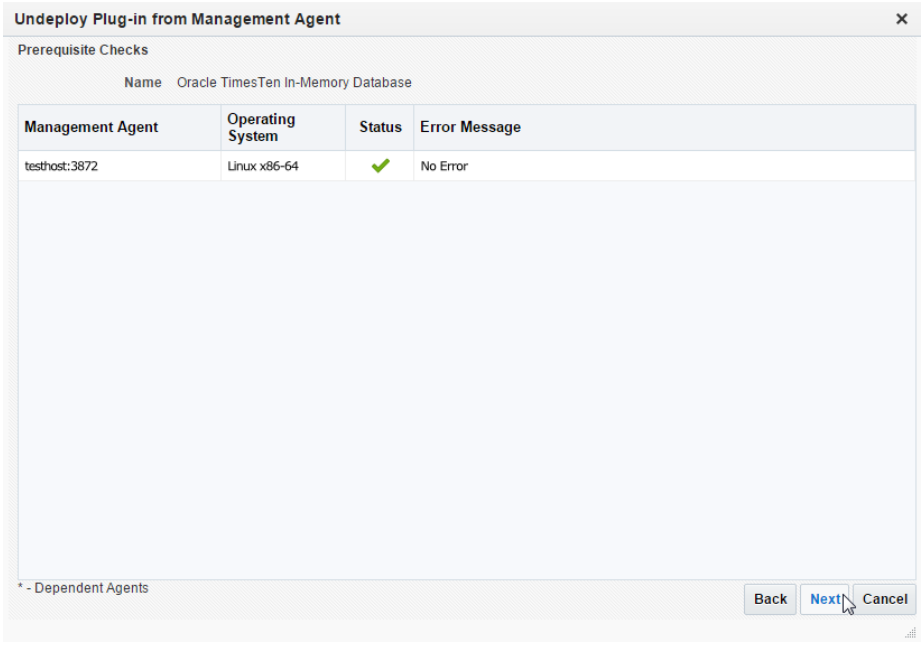
Figure 1–77 Click Continue



The Undeploy Plug-in from Management Prerequisite Checks dialog displays. Ensure that there is a green check mark in the Status column of the Management Agent table.

7. Click **Next**.

Figure 1–78 Click Next

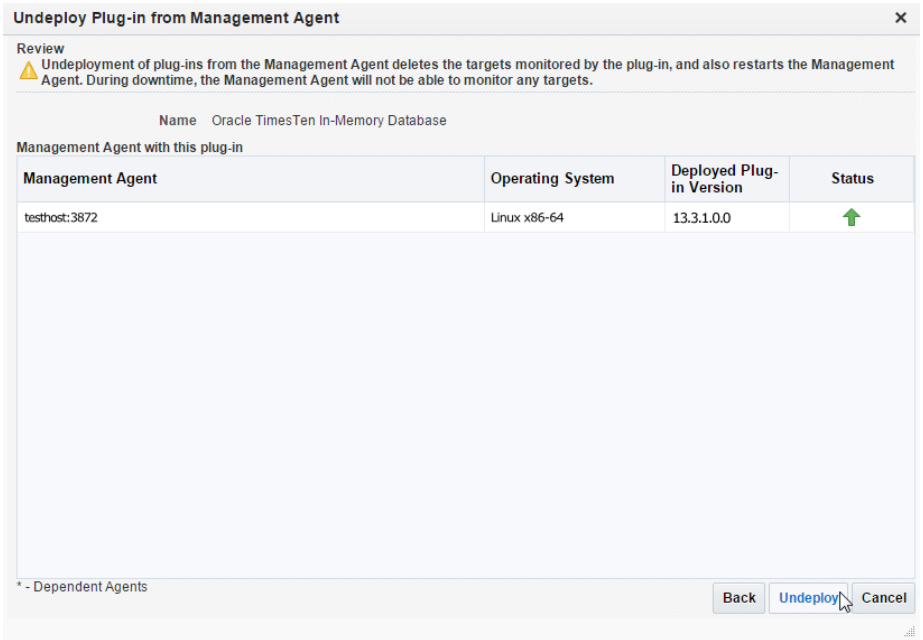


The Undeploy Plug-in From Management Agent Review dialog displays and shows the informational message, "Undeployment of plug-ins from the Management Agent deletes the targets monitored by the plug-in, and also restarts the Management Agent. During downtime, the Management Agent will not be able to monitor any targets."

In the Management Agent with this plug-in table, verify the name in the Management Agent column is correct.

8. Click **Undeploy**.

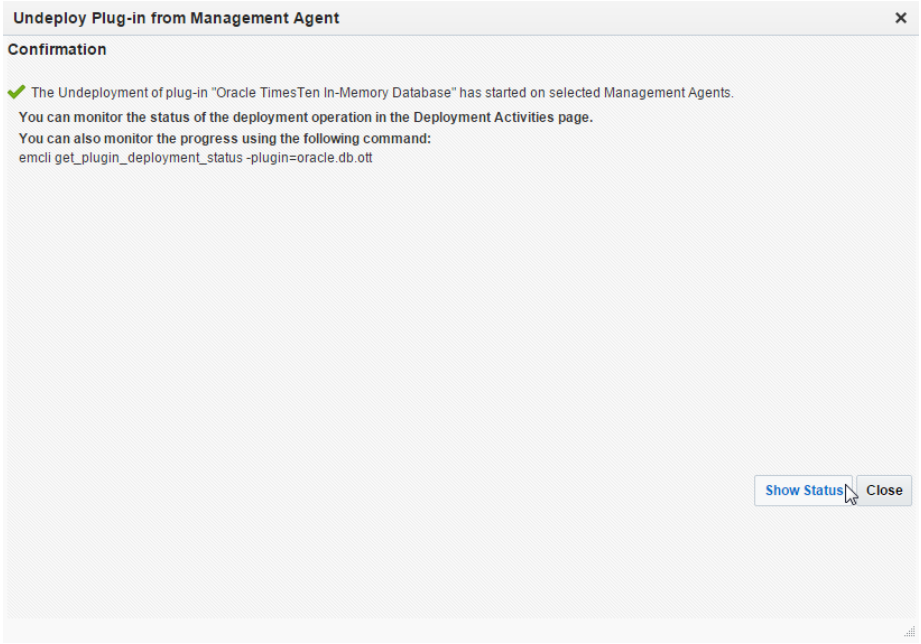
Figure 1–79 Click Undeploy



The Undeploy Plug-in from Management Agent Confirmation dialog displays with a message indicating the undeployment of the plug-in has started on selected agents. The undeployment time varies. You may monitor the undeployment status by clicking Show Status or going to the Recent Deployment Activities page.

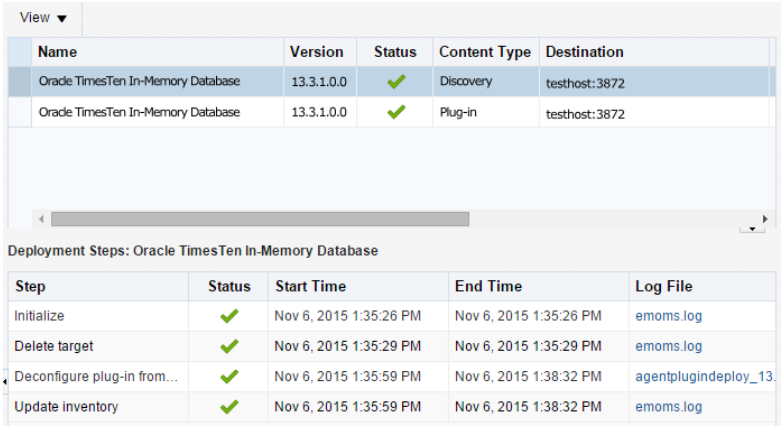
9. Click **Show Status**.

Figure 1–80 Undeploy agent confirmation



The Plug-ins Deployment Activities page displays showing the status of the undeployment steps in table format. Verify the first step located in the first row of the table contains the text, "Initialize" and verify the last step located in the last row of the table contains the text, "Update inventory." This is the last step in the undeployment process. Ensure that there are green checks in the Status column of each row in the Deployment Steps table. Such checks indicate all steps in the undeployment process are completed and are successful. Also, ensure that there is a green check in the Status column in the undeployment table located at the top of the page. If auto refresh is set to off, you may want to set auto refresh to 15 seconds, so you can see the steps as they are completed.

Figure 1–81 Undeployment successful



The plug-in is undeployed from the Management Agent and the automatic discovery scripts of the plug-in are removed from the Management Agent. Repeat Steps 1-8 to undeploy each management agent that is monitoring the plug-in.

You are now ready to undeploy the plug-in from the Oracle Management Service (OMS).

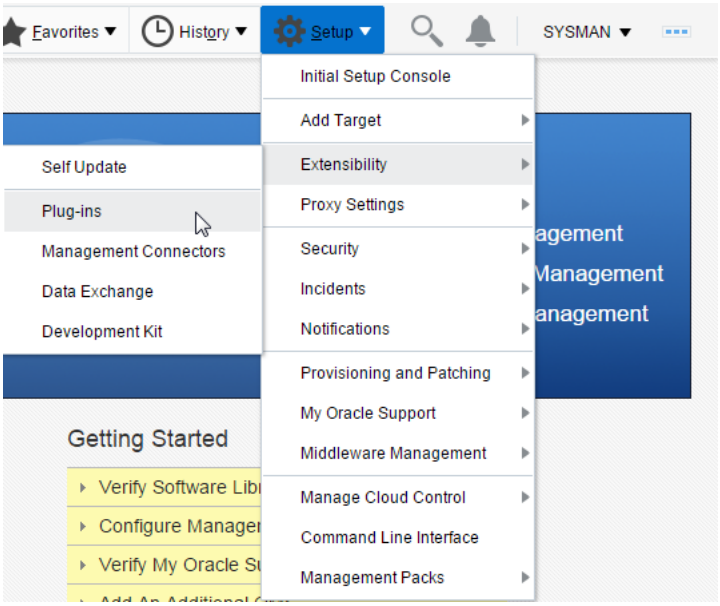
Undeploy the plug-in from OMS

Before you undeploy the plug-in from OMS, ensure that you have undeployed the plug-in from all the Management Agents that are monitoring the plug-in.

To undeploy the plug-in from OMS, ensure that you are on the Oracle Enterprise Manager Cloud Control home page.

1. From the **Setup** menu, select **Extensibility**, then select **Plug-ins**.

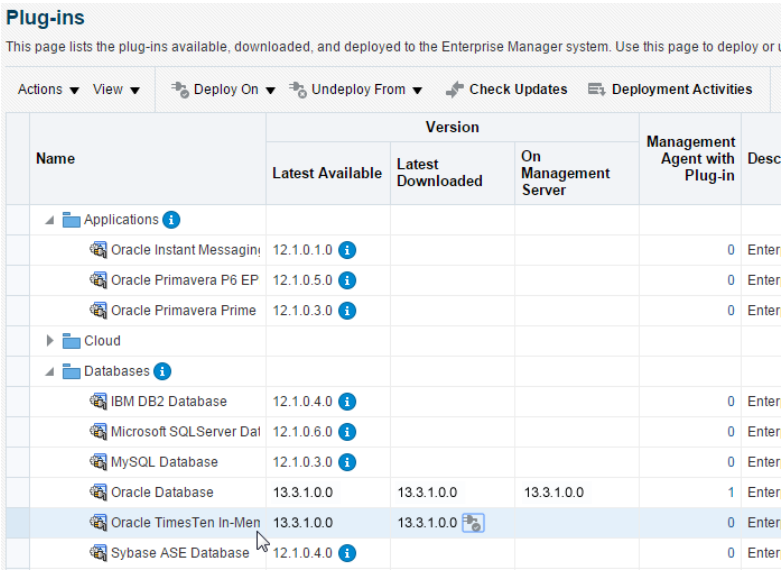
Figure 1–82 Select Extensibility, then Plug-ins



The Plug-ins page displays and shows the Plug-ins table. Locate the Databases folder in the Name column.

2. Expand the Databases folder in the Name column and select **Oracle TimesTen In-Memory Database**.

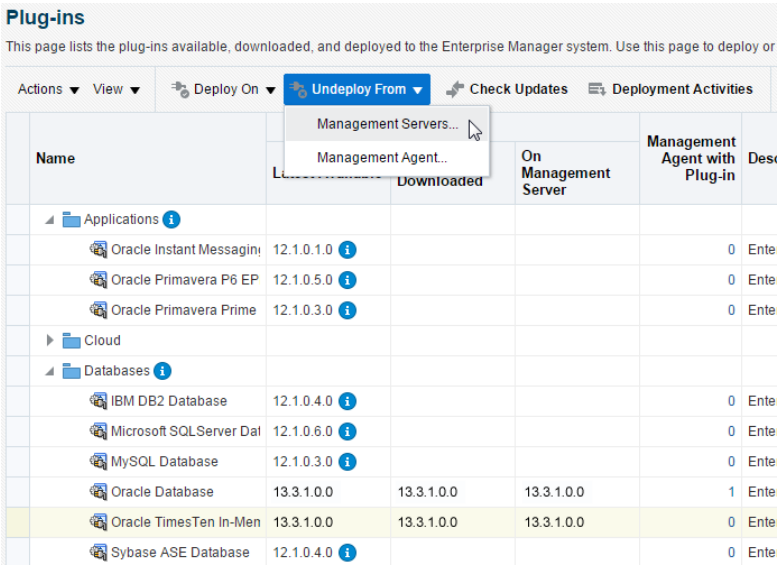
Figure 1–83 Select TimesTen In-Memory Database plug-in



You are now ready to undeploy the plug-in from OMS. Locate the Undeploy From tab at the top of the page.

3. From the **Undeploy From** menu, select **Management Servers...**.

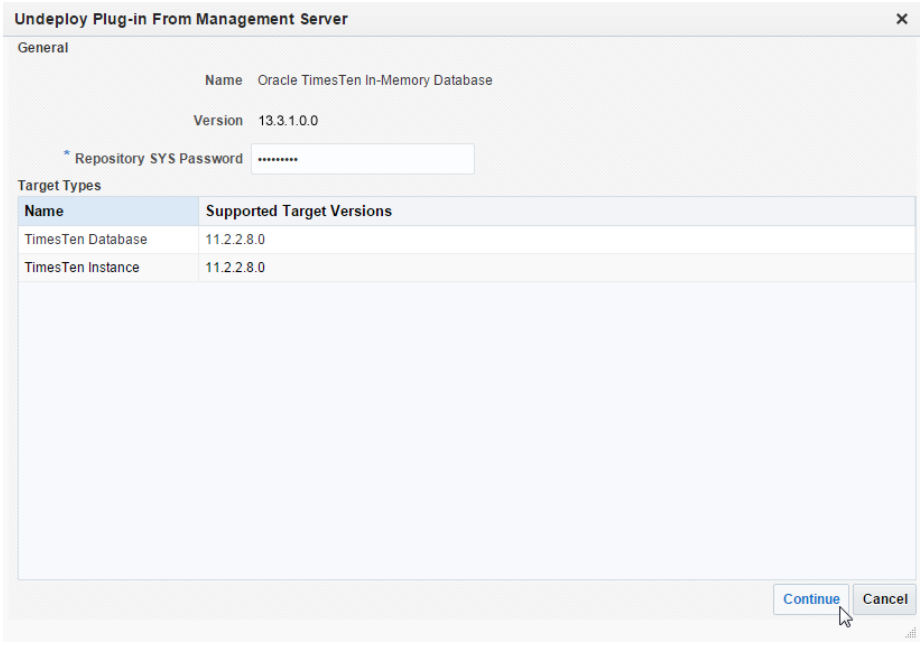
Figure 1–84 Undeploy from OMS



The Undeploy Plug-in from Management Server General page displays. The plug-in Oracle TimesTen In-Memory Database is displayed in the Name column and the Version is auto-filled. You must enter the Repository `SYS` user password.

4. In the ***Repository SYS Password** column, type the Repository `SYS` user password. Then, click **Continue**.

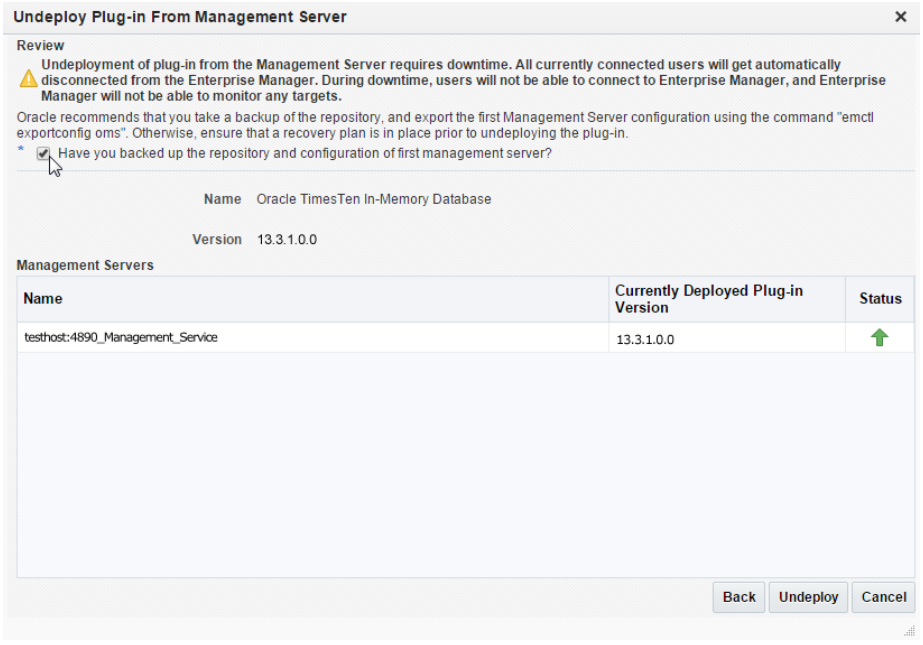
Figure 1–85 Repository SYS Password



The Undeploy Plug-in From Management Server Review page displays. In the Management Servers table, verify the Management Server name is correct. Verify the version is correct. Also, consider making a backup of the OMS repository before deploying the plug-in. For more information on backing up the OMS repository, see "Backing Up the OMS" in the *Oracle Enterprise Manager Cloud Control Advanced Installation and Configuration Guide*.

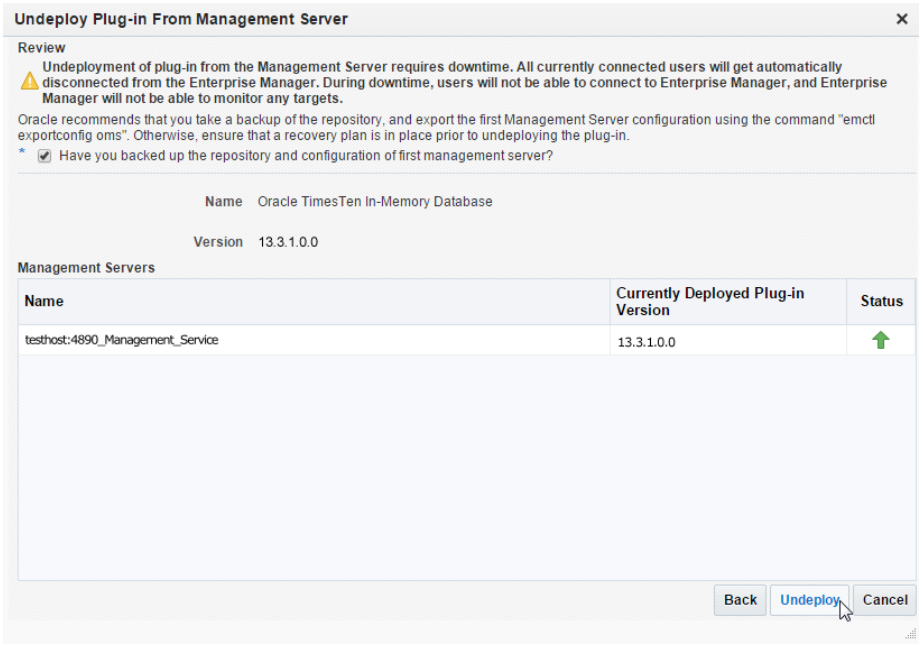
5. Select the **Have you backed up the repository and configuration of first management server?** check box.

Figure 1–86 Select repository backup confirmation



6. Click **Undeploy**.

Figure 1–87 Review Undeploy from OMS

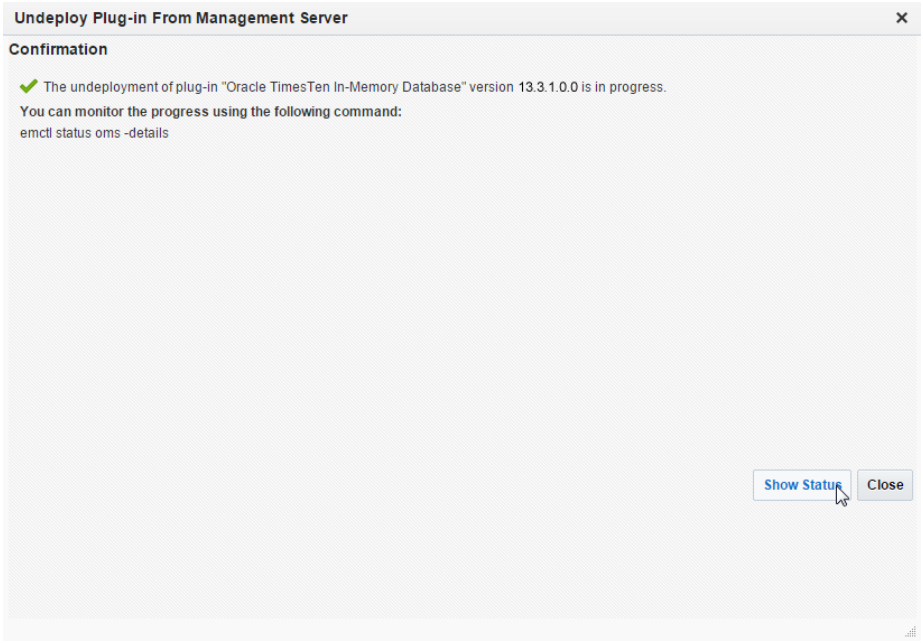


Note: The Oracle Enterprise Manager Cloud Control server restarts during the undeployment process.

The Undeploy Plug-in From Management Server Confirmation page displays with a message indicating the undeployment of the plug-in is in progress. The undeployment time varies. You may monitor the undeployment status by clicking Show Status or going to the Recent Deployment Activities page.

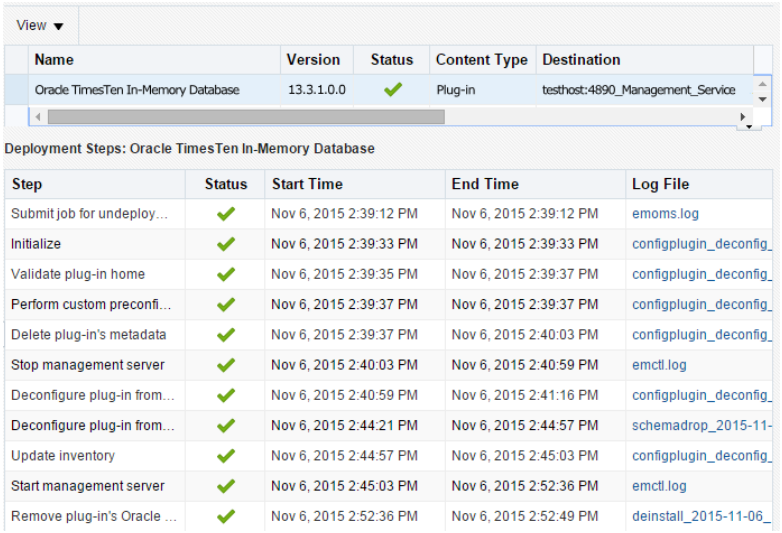
7. Click **Show Status**.

Figure 1–88 Undeploy from OMS confirmation



The Plug-ins Deployment Activities page displays showing the status of the undeployment steps in table format. Verify the last step located in the last row of the table contains the text, "Remove plugin's oracle home." This is the last step in the undeployment process. Ensure that there are green checks in the Status column of each row in the Deployment Steps table. Such checks indicate all steps in the undeployment process are completed and are successful. Also, ensure that there is a green check in the Status column in the undeployment table located at the top of the page. If auto refresh is set to off, you may want to set auto refresh to 15 seconds, so you can see the steps as they are completed.

Figure 1–89 Undeployment of OMS successful



The plug-in is undeployed from OMS.

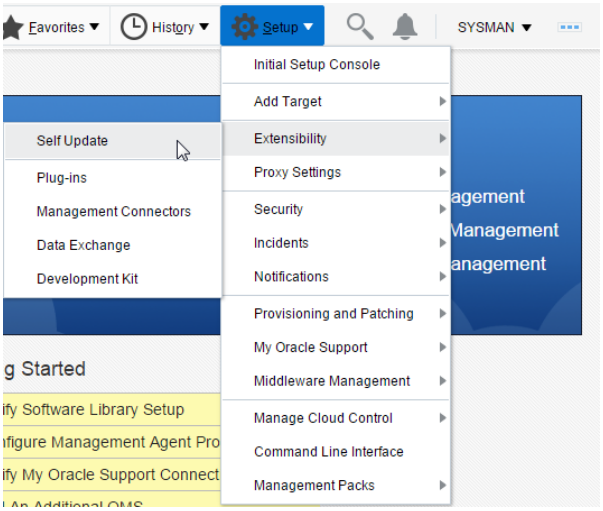
You are now ready to delete the plug-in from OMS and the Management Agent.

Delete the plug-in

When you delete the plug-in, you remove the plug-in from the Oracle Enterprise Manager Cloud Control. To delete the plug-in, ensure that you are on the Oracle Enterprise Manager Cloud Control home page.

1. From the **Setup** menu, select **Extensibility**, then select **Self Update**.

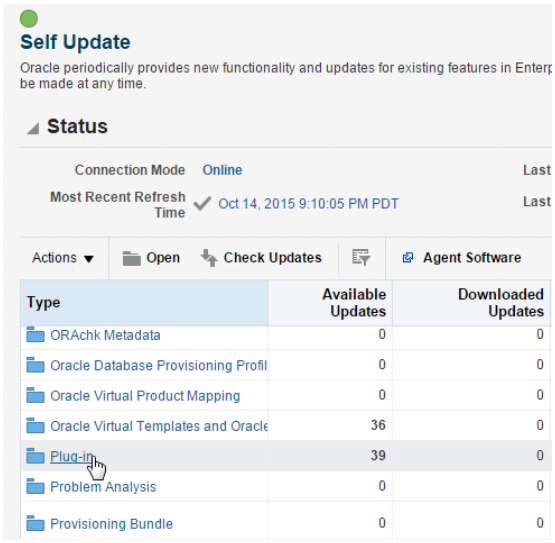
Figure 1–90 Select Extensibility, then Self Update



The Self Update page displays. Locate the Plug-in folder.

2. Click the name **Plug-in**.

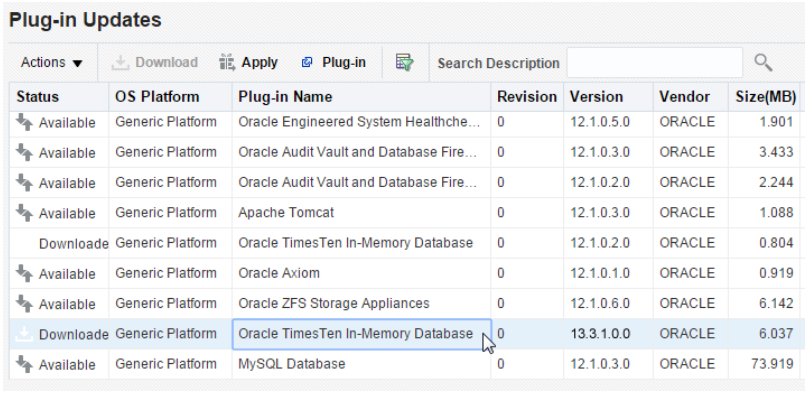
Figure 1–91 Plug-in folder



The Plug-in Updates page displays. In the Plug-in Name column, locate Oracle TimesTen In-Memory Database. Confirm the Status column is equal to Downloaded.

3. In the Plug-in Name column, click **Oracle TimesTen In-Memory Database**.

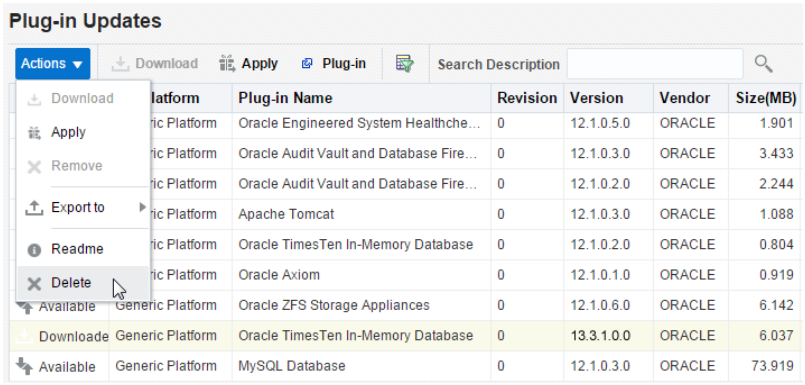
Figure 1–92 Plug-in updates



Prepare to expand the Actions tab located under Plug-in Updates at the top of the page.

4. Expand **Actions** and select **Delete**.

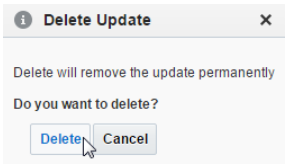
Figure 1–93 Delete plug-in



The Delete Update dialog displays indicating the delete will remove the update (plug-in) permanently. Prepare to confirm the delete by clicking Delete.

5. Click **Delete**.

Figure 1–94 Delete Update confirmation



A confirmation dialog displays indicating that the update (plug-in) has been deleted permanently.

6. Click **OK.**

You have successfully deleted the plug-in. You can verify the plug-in has been deleted by reviewing the Plug-in Updates page. You should no longer see the TimesTen plug-in.

2

Working with the TimesTen Target Page

The TimesTen plug-in collects many metrics that are useful in troubleshooting performance issues. The TimesTen target page displays a collective view of your database or instance, the performance of your database, and control operations for your instance.

This chapter details the procedure for navigating to the TimesTen target page and provides an overview of the TimesTen target page.

Topics include:

- Navigating to the TimesTen target page
- Overview of the TimesTen instance target page
- Overview of the TimesTen database target page
- Setting the display time period and auto refresh rate of data on a target page
- Viewing the log of control operations

Navigating to the TimesTen target page

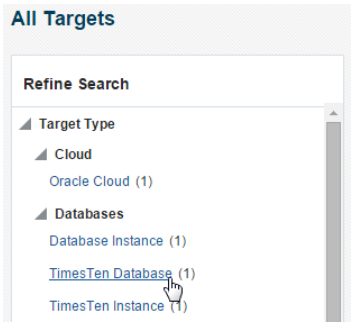
To navigate to the TimesTen target page:

1. From the **Targets** menu, select **All Targets** on the Enterprise Manager Cloud Control 13c home page.

   The All Targets page displays. Locate the Refine Search panel under **All Targets**.

2. Expand **Target Type**, then **Databases** and click **TimesTen Instance** or **TimesTen Database**.

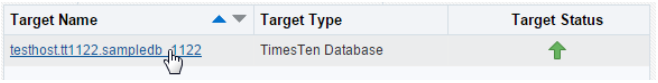
Figure 2–1 Choose TimesTen Database



The target table displays. For each row in the table, confirm the column Target Type contains **TimesTen Instance** or **TimesTen Database**. The number of rows depends on the number of TimesTen targets you have configured. For example, if you configured two TimesTen targets, then you should see two rows in the table.

3. In the column Target Name, identify the TimesTen target you want to review, and click the **Target Name**. The target name is the name of the TimesTen target you configured.

Figure 2–2 Click the target name

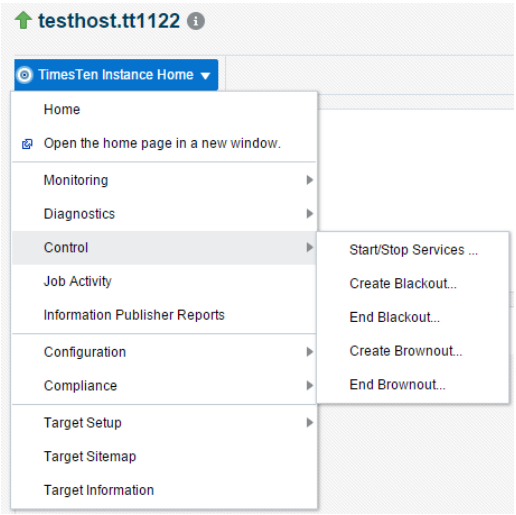


The TimesTen target page displays. See "Overview of the TimesTen instance target page" on page 2-2 for more information on the TimesTen instance target page. See "Overview of the TimesTen database target page" on page 2-3 for more information on the TimesTen database target page.

Overview of the TimesTen instance target page

The TimesTen instance target page enables you to gather monitoring and metrics information specific to TimesTen instances and control the TimesTen daemon and server. Figure 2–3, "TimesTen instance target page" shows Enterprise Manager Cloud Control menu choices and menu choices that have been customized for TimesTen instance targets.

Figure 2–3 TimesTen instance target page



A description of the menu choices that have been customized for TimesTen instance targets follows:

- **Home**

  Displays high level information about the TimesTen instance. See Chapter 4, "Working with the TimesTen Instance Home Page" for more information.

- **Monitoring - All Metrics**

Displays TimesTen instance metric information in table format. See "Viewing TimesTen instance metrics" on page 14-24 for more information.

- **Control - Start/Stop Services**

  Displays controls to start and stop the TimesTen daemon and server. See "Start/stop services" on page 9-1 for more information.

- **Control - Create Blackout**

  Displays controls to create a blackout to suspend all data collection activity on a target that is monitored by Enterprise Manager. See "Create blackout" on page 9-2 for more information.

- **Control - End Blackout**

  Displays controls to end a blackout and resume all data collection activities on a target that is monitored by Enterprise Manager. See "End blackout/brownout" on page 9-3 for more information.

- **Control - Create Brownout**

  Displays controls to create a brownout to suppress all notifications on a target that is monitored by Enterprise Manager. See "Create brownout" on page 9-3 for more information.

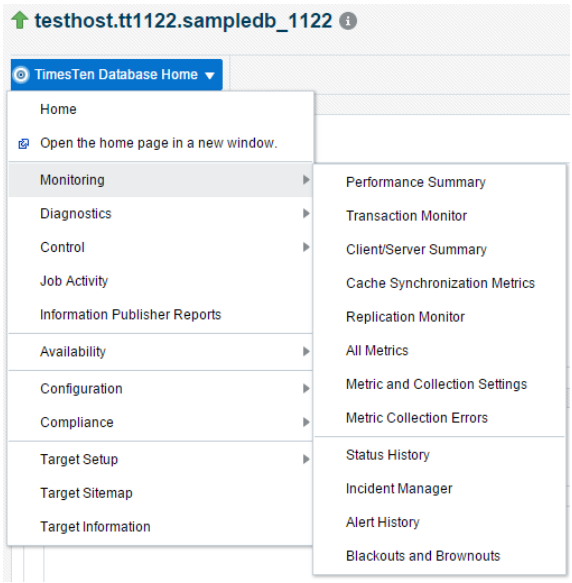
- **Control - End Brownout**

  Displays controls to end a brownout and resume all notifications on a target that is monitored by Enterprise Manager. See "End blackout/brownout" on page 9-3 for more information.

Overview of the TimesTen database target page

The TimesTen database target page enables you to gather monitoring and metrics information specific to TimesTen database targets and control various functions of the TimesTen database. Figure 2–4, "TimesTen target page" shows Enterprise Manager Cloud Control menu choices and menu choices that have been customized for TimesTen database targets.

Figure 2–4 TimesTen target page



A description of the menu choices that have been customized for TimesTen targets follows:

- **Home**

  Displays high level performance metrics and configuration data. See Chapter 5, "Working with the TimesTen Database Home Page" for more information.

- **Monitoring - Performance Summary**

  Displays performance metrics in graphical format. See Chapter 6, "Working with the Performance Summary Page" for more information.

- **Monitoring - Transaction Monitor**

  Displays a snapshot of the current transactions in your TimesTen database and describes details about your transactions. See Chapter 7, "Working with the Transaction Monitor" for more information.

- **Monitoring - Client/Server Summary**

  Displays client/server information about your database. See Chapter 8, "Working with the Client/Server Page" for more information.

- **Monitoring - Cache Synchronization Metrics**

  Displays cache synchronization metrics. See Chapter 12, "Working with the Cache Synchronization Metrics Page" for more information.

- **Monitoring - Replication Monitor**

  Displays information for monitoring replication. See Chapter 13, "Working with the Replication Monitor" for more information.

- **Monitoring - All Metrics**

  Displays metric information about your TimesTen database target in table format. See "Viewing TimesTen database metrics" on page 14-3 for more information.

- **Control - Start/Stop Agents**

  Displays controls to start and stop the cache and replication agents. See "Start/stop agents" on page 10-1 for more information.

- **Control - Ram Load/Unload and Policy Settings**

  Displays controls to control and configure the RAM policy of the TimesTen database. See "Ram load/unload and policy settings" on page 10-2 for more information.

- **Control - Create Blackout**

  Displays controls to create a blackout to suspend all data collection activity on a target that is monitored by Enterprise Manager. See "Create blackout" on page 9-2 for more information.

- **Control - End Blackout**

  Displays controls to end a blackout and resume all data collection activities on a target that is monitored by Enterprise Manager. See "End blackout/brownout" on page 9-3 for more information.

- **Control - Create Brownout**

  Displays controls to create a brownout to suppress all notifications on a target that is monitored by Enterprise Manager. See "Create brownout" on page 10-4 for more information.

- **Control - End Brownout**

  Displays controls to end a brownout and resume all notifications on a target that is monitored by Enterprise Manager. See "End blackout/brownout" on page 9-3 for more information.

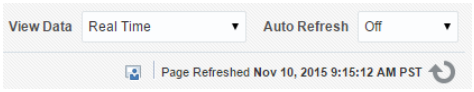
- **Availability - Backup and Restore**

  Displays controls to backup and restore the TimesTen database. See Chapter 11, "Working with the Backup and Restore Page" for more information.

Setting the display time period and auto refresh rate of data on a target page

Enterprise Manager enables you to set the display frequency and auto refresh rate of data on a target page.

Figure 2–5 View Data and Auto Refresh region



You can set the time period and auto refresh rate of data with the following options:

- View data
- Auto refresh

View data

The View Data option enables you to view data on a target page based on a historical time period or in real time. This option is not available on all TimesTen target pages and only affects graphs. When a TimesTen target page has a View Data option it is located in the top right corner of the page with the following options:

- Real Time
- Last 2 Hours
- Last 24 Hours
- Last 7 Days
- Last 31 Days
- Custom Time Period...

By default, every TimesTen target page uses a view data time period of Last 24 Hours. It is recommended to use the Real Time option of View Data when monitoring a TimesTen target.

Auto refresh

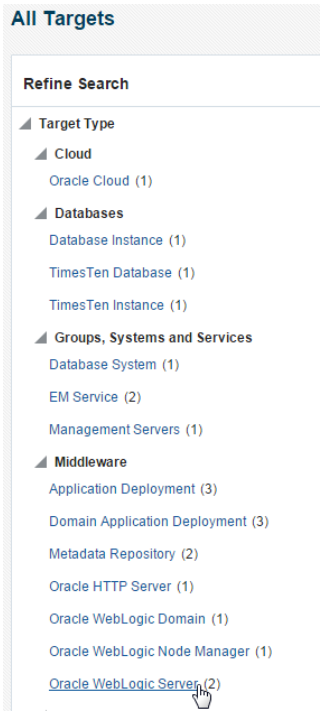
The Auto Refresh option enables you to control the auto refresh rate of a target page. This option is available on all TimesTen target pages and affects the whole target page. The Auto Refresh option is located in the top right corner of the target page and the options vary depending on the value of the View Data option.

Viewing the log of control operations

Enterprise Manager logs all control operations that are performed on Enterprise Manager targets. In some cases it is useful to review these logs.

1. From the **Targets** menu, select **All Targets** on the Enterprise Manager Cloud Control 13c home page.
2. Expand **Target Type**, then **Middleware** and click **Oracle WebLogic Server**.

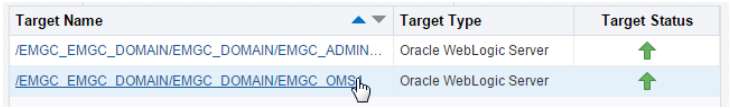
Figure 2–6 Select Oracle WebLogic Server



The target table displays. For each row in the table, confirm the column Target Type contains **Oracle WebLogic Server**.

3. In the column Target Name, identify the Oracle WebLogic Server target that manages your OMS, and click the **Target Name**. Typically this target name is `/EMGC_EMGC_DOMAIN/EMGC_DOMAIN/EMGC_OMS1`.

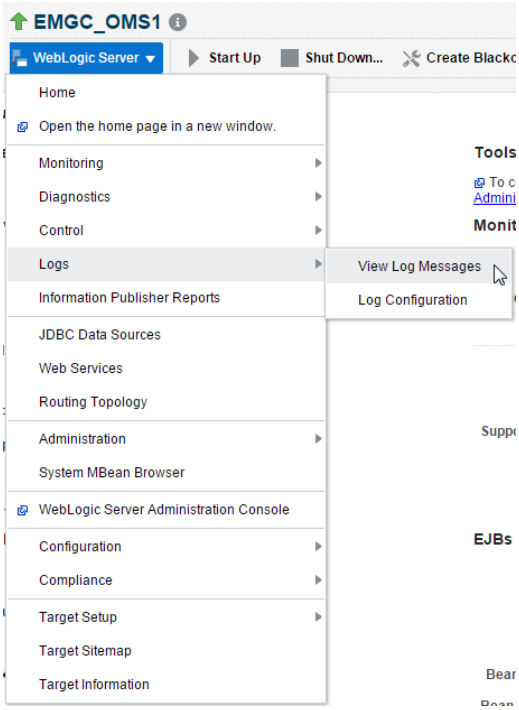
Figure 2–7 Click the target name



The WebLogic Server target page displays. Locate the WebLogic Server menu.

4. From the **WebLogic Server** menu, select **Logs**, then **View Log Messages**.

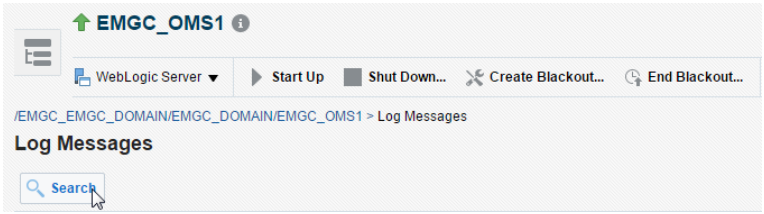
Figure 2–8 Select View Log Messages



The Log Messages page displays. Locate the Search button under the Log Messages title.

5. Click Search.

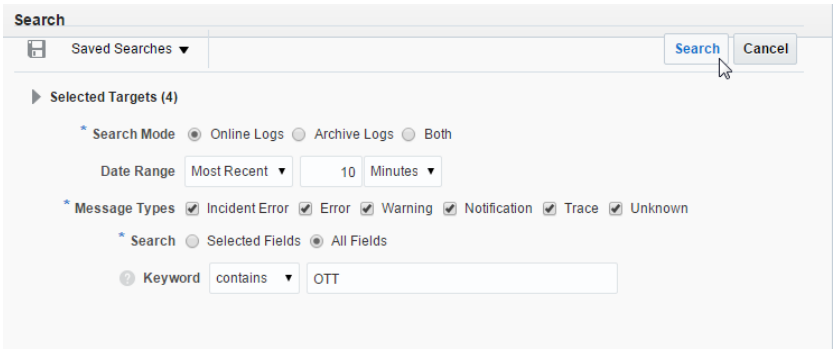
Figure 2–9 Click Search



The Search dialog displays. Locate the Search Mode field.

6. In the ***Search Mode** field, select the **Online Logs** option. If you want to search through archived logs or both types of logs, select Archive Logs or Both.
7. In the **Date Range** field, select an appropriate date range.
8. In the ***Message Types** field, select the type of messages that you want to search through. It is recommended to check all message types. TimesTen control operations are logged in trace files.
9. In the ***Search** field, select **All Fields**.
10. In the **Keyword** field, select **contains** from the drop-down list and enter **OTT** in the text field.
11. Click **Search**.

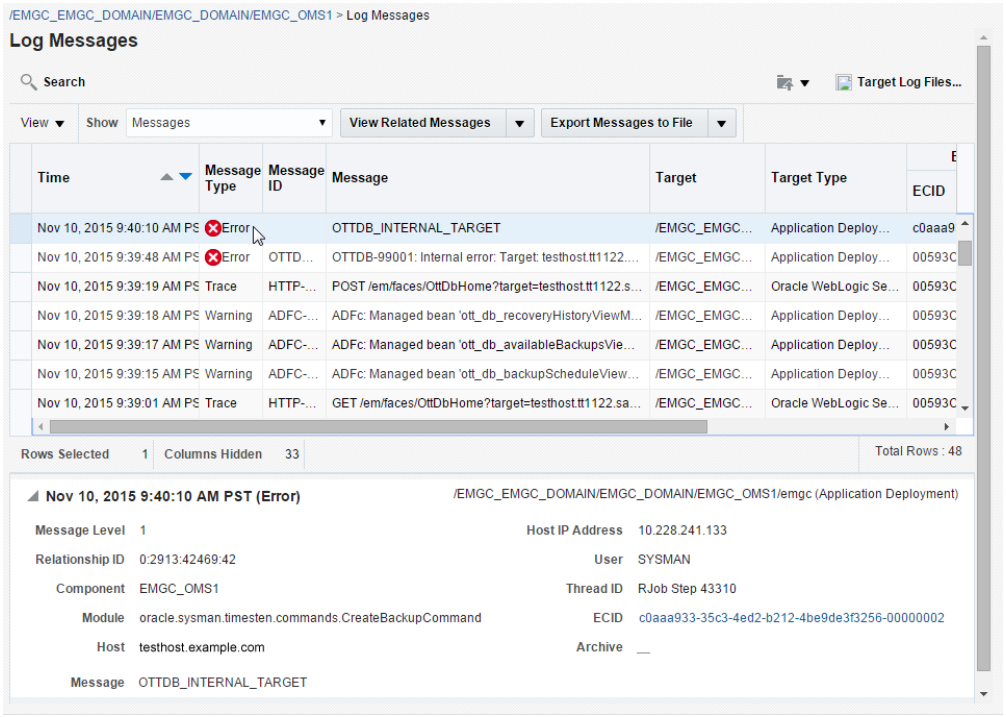
Figure 2–10 Search log messages



A processing dialog displays. The search can take several minutes. When the search is complete, the processing dialog closes and the Log Messages page displays. You should see your search results in a table below the Search button. Locate issues that you want to review.

12. Click in the row that identifies the issue that you want to troubleshoot.

Figure 2–11 Search results



Troubleshoot the issues with the details that are displayed in the results region that is located at the bottom of the page.

3

Working with Access Control

This chapter focuses on access control of TimesTen targets in Oracle Enterprise Manager Cloud Control.

Topics include:

- Overview of access control
- Creating a group
- Defining roles
- Creating users
- Granting preferred credentials to users

Overview of access control

The Oracle Enterprise Manager uses privileges that are assigned to roles to manage targets and their operations. Targets can be grouped into groups. A TimesTen Enterprise Manager administrator can assign roles and groups to users to determine how and what they can manipulate in a TimesTen target.

> **Note:** The default super administrator of Enterprise Manager, `SYSMAN`, can view and control all TimesTen targets without having to belong to a group or be assigned a role.

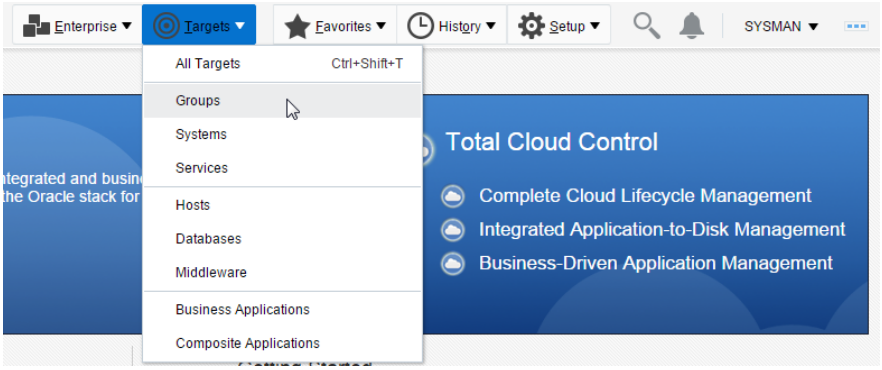
Creating a group

You must create these groups:

- A group that contains the host or hosts that contains your TimesTen targets.
- A group that contains the TimesTen targets that this group can view and control. You can combine TimesTen instances and databases into a single group or create multiple groups.

1. From the **Targets** menu, select **Groups**.

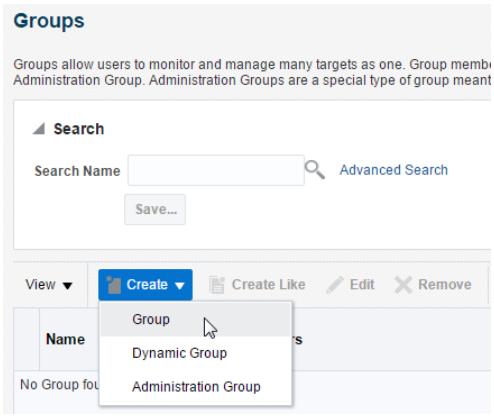
Figure 3–1 Select Groups



The Groups page displays. Locate the Create button above the group table.

2. Expand **Create** and select **Group**.

Figure 3–2 Create a group

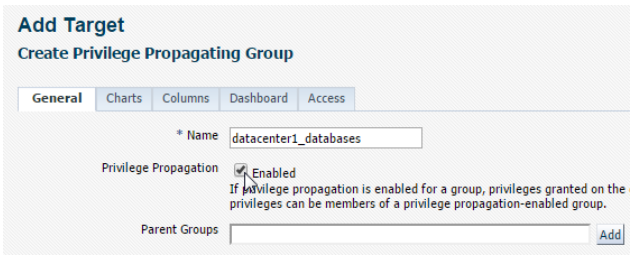


The Add Target Create Group page displays. Prepare to enter the properties for your group. The first property is the group name.

In the *Name text field, you define the group name. Choose a name that is a meaningful identifier. (For example, `datacenter1_hosts` or `datacenter1_databases`.)

3. Click in the check box to the right of **Privilege Propagation**. This setting allows group users to have access to new targets that are added to this group at a later date.

Figure 3–3 Enable privilege propagation

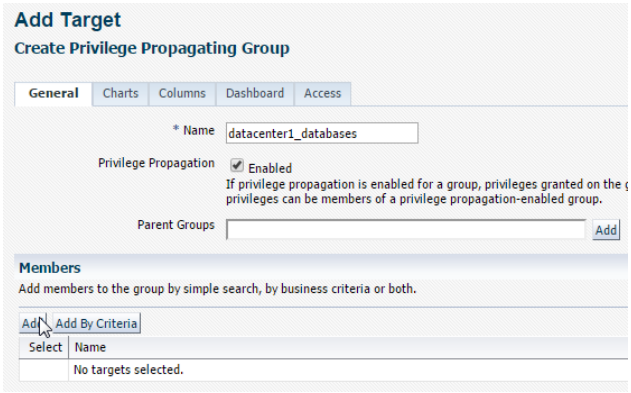


You are now ready to add member targets to your group. You can combine any type of Enterprise Manager target in your group, including TimesTen instance and TimesTen database targets. However, ensure that you create separate groups for hosts and TimesTen targets. For more information on adding TimesTen targets, see "Configure a TimesTen target" on page 1-17.

Locate the Add button in the Members region.

4. Click **Add**.

Figure 3–4 Add member

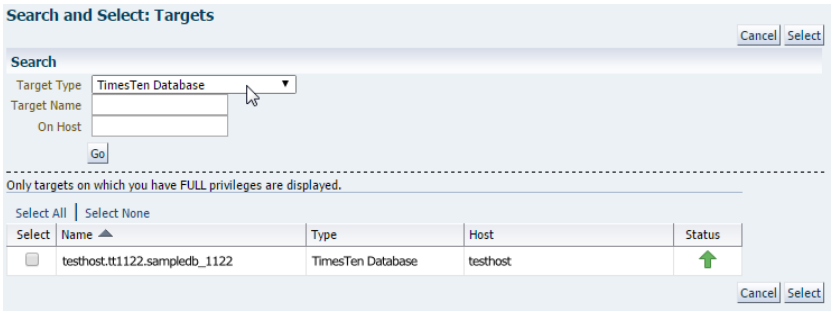


The Search and Select: Targets page displays. Locate the Target Type drop-down list in the Search region.

5. Expand the drop-down list labeled **Target Type** and select **Host**, **TimesTen Instance**, or **TimesTen Database**.

> **Note:** Ensure that you separate hosts and TimesTen targets into different groups.

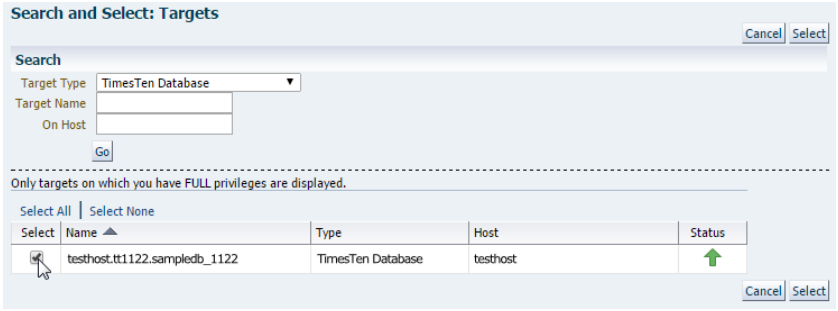
Figure 3–5 Search results



The page refreshes with the results of your search. In the Name column, locate the row that contains the target name that you want to add to the group. Confirm the status is a green up arrow.

6. Select **the check box** of the row that identifies the **Name** of the row containing the target. If you want to add multiple targets, select the corresponding check box of any additional targets.

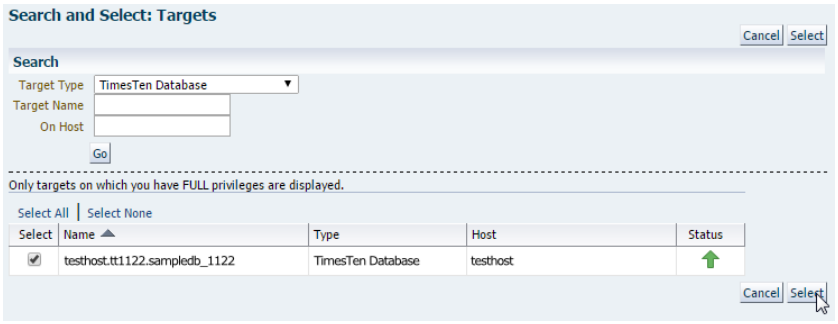
Figure 3–6 Select target



Locate the Select button.

7. Click **Select**.

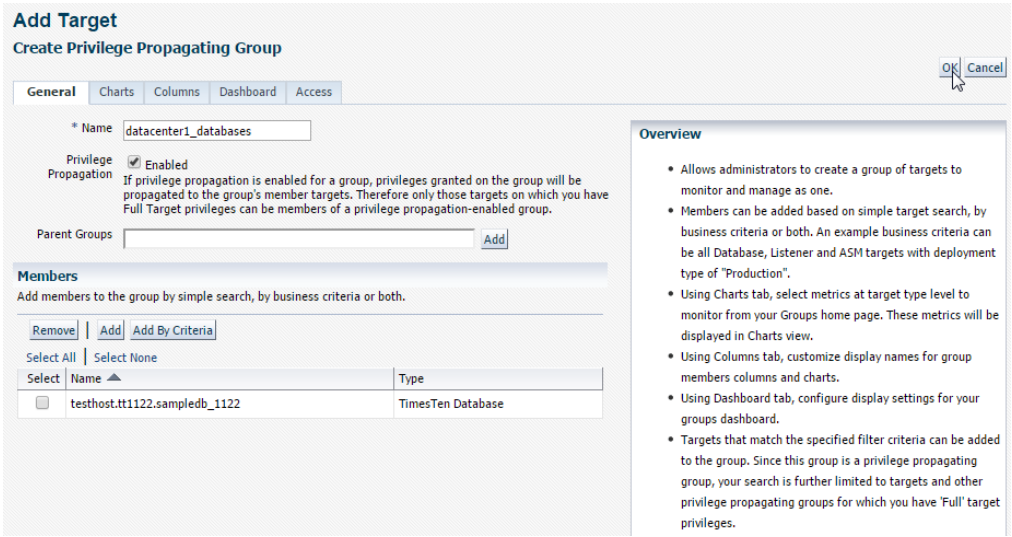
Figure 3–7 Click Select



The Search and Select: Targets page closes and the Add Target Create Privilege Propagating Group page refreshes. You should now see your selected target in the Members table. Locate the OK button in the top right corner of the page.

8. Click **OK**.

Figure 3–8 Click OK



The Information Dialog displays. You should see the informational message "Group *group_name* has been added." Locate the OK button.

9. Click **OK**.

   The Information dialog closes. You successfully created an Enterprise Manager group.

Your Enterprise Manager group is created. Repeat steps 1-9 to create additional groups. If you have one host group and at least one TimesTen target group, you can define Enterprise Manager roles.

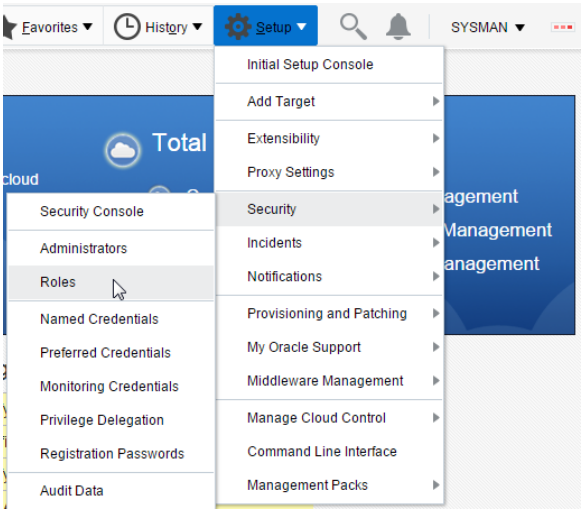
Defining roles

Create a role that contains the privileges that you want to assign to Enterprise Manager users.

Ensure that you have at least one host group and one TimesTen target group. For more information on the steps to create an Enterprise Manager group, see "Creating a group" on page 3-1.

1. From the **Setup** menu, select **Security**, then select **Roles**.

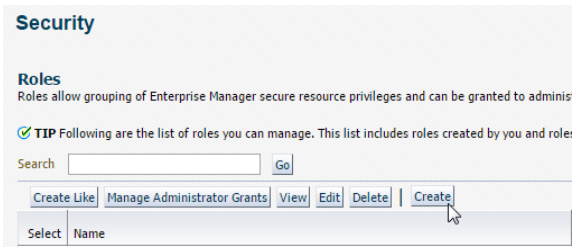
Figure 3–9 Select Roles



   The Security Roles page displays. Locate the Create button above the Roles table.

2. Click **Create**.

Figure 3–10 Click Create



   The Create Role: Properties page displays. You are now ready to enter the Enterprise Manager role properties. The first property is the role name.

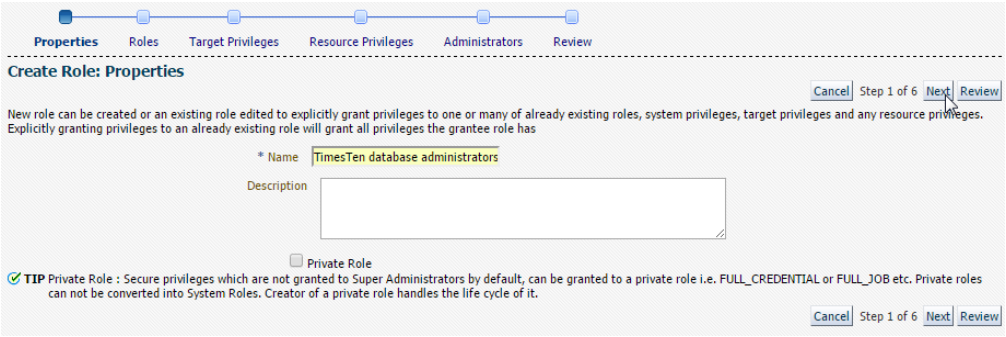
   In the *Name text field, you define the role name. Choose a name that is a meaningful identifier. (For example, `TimesTen database administrators`.)

3. In the ***Name** text field, type the Enterprise Manager role name.

   Locate the Next button in the upper right corner of the page.

4. Click **Next**.

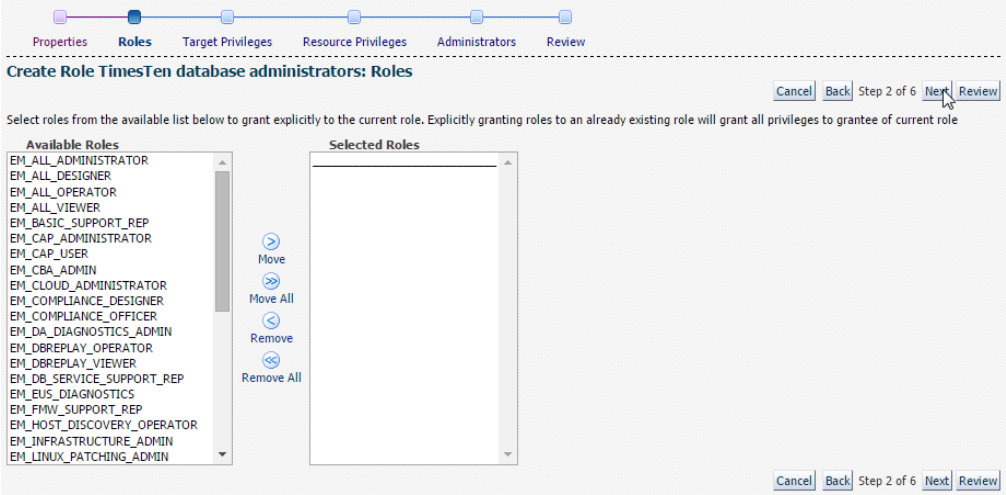
Figure 3–11 Click Next



The Create Role *role_name*: Roles page displays. Locate the Next button in the upper right corner of the page.

5. Click **Next**.

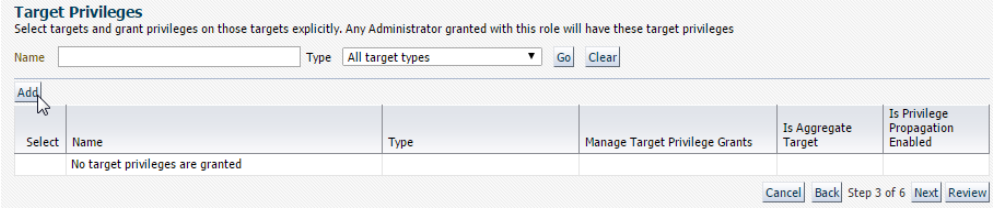
Figure 3–12 Click Next



The Create Role *role_name*: Target Privileges page displays. Locate the Target Privileges region at the bottom of the page.

6. Click the **Add** button from the Target Privileges region.

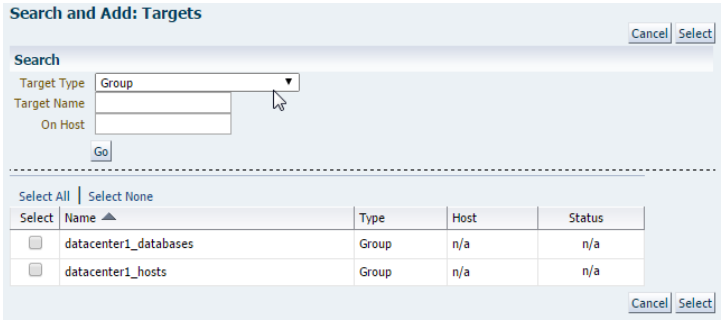
Figure 3–13 Select privilege(s)



The Search and Add: Targets page displays. Locate the Target Type drop-down list in the Search region.

7. Expand the drop-down list labeled **Target Type** and select **Group**.

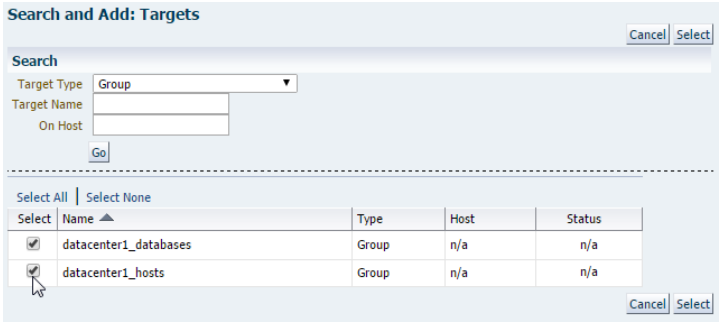
Figure 3–14 Search results



The page refreshes with the results of your search. In the Name column, locate the row that contains the group names that you want to add to the role. You should have at least one TimesTen target group and its respective host group.

8. Select **the check boxes** of the rows that identify the **Name** of the rows containing the groups. Ensure to select a TimesTen target group and its respective host group.

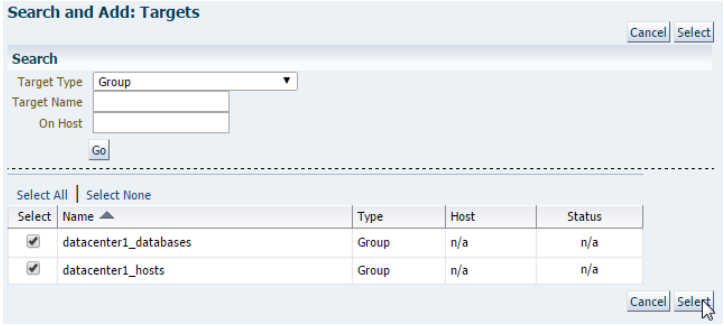
Figure 3–15 Select groups



Locate the Select button.

9. Click **Select**.

Figure 3–16 Click Select

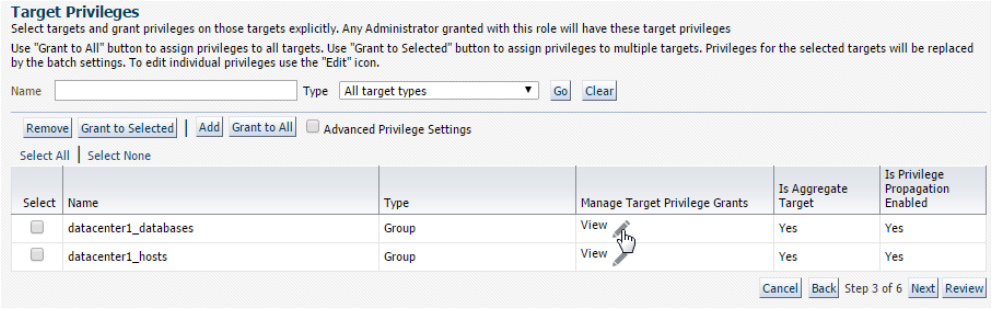


The Search and Add: Targets page closes and the Create Role *role_name*: Target Privileges page refreshes. You should now see your selected groups in the Target

Privileges table. In the Target Privileges table, locate the row that contains your TimesTen target group. In the TimesTen target group row, locate the pencil button in the Manage Target Privilege Grants column.

10. In the TimesTen target group row, click the **pencil** button in the Manage Target Privilege Grants column.

Figure 3–17 Manage target privilege grants



The Create Role *role_name*: Target Privileges page refreshes. Locate the Target Privileges table.

The Target Privileges table contains all of the available Enterprise Manager privileges that you can assign to a group. Enterprise Manager Cloud Control has a variety of privileges, but only two privileges are important for TimesTen operations:

- View

  This privilege is needed to view TimesTen targets.

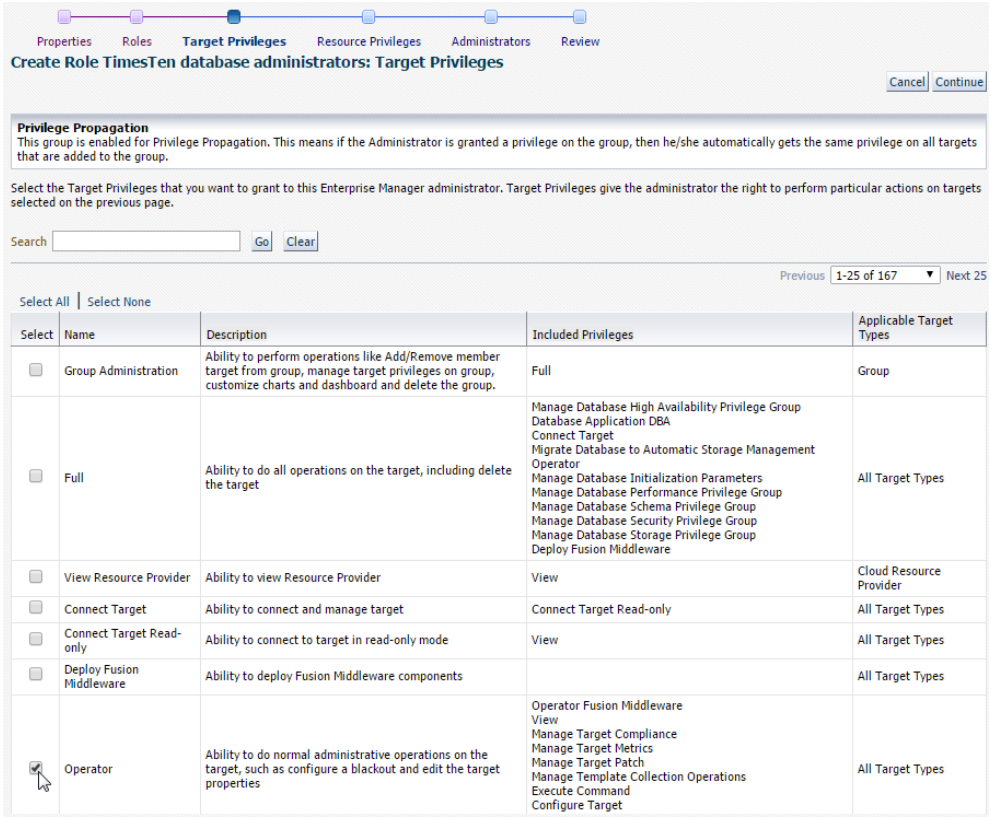
- Operator

  This privilege is needed for TimesTen target control operations. The operator privilege includes the view privilege.

Identify the Name of the privilege(s) that you want to assign to this role.

11. Select the check box of the row that identifies the **Name** of the privilege that you want to assign to this group. If you want to add multiple privileges, select the corresponding check box of any additional privilege.

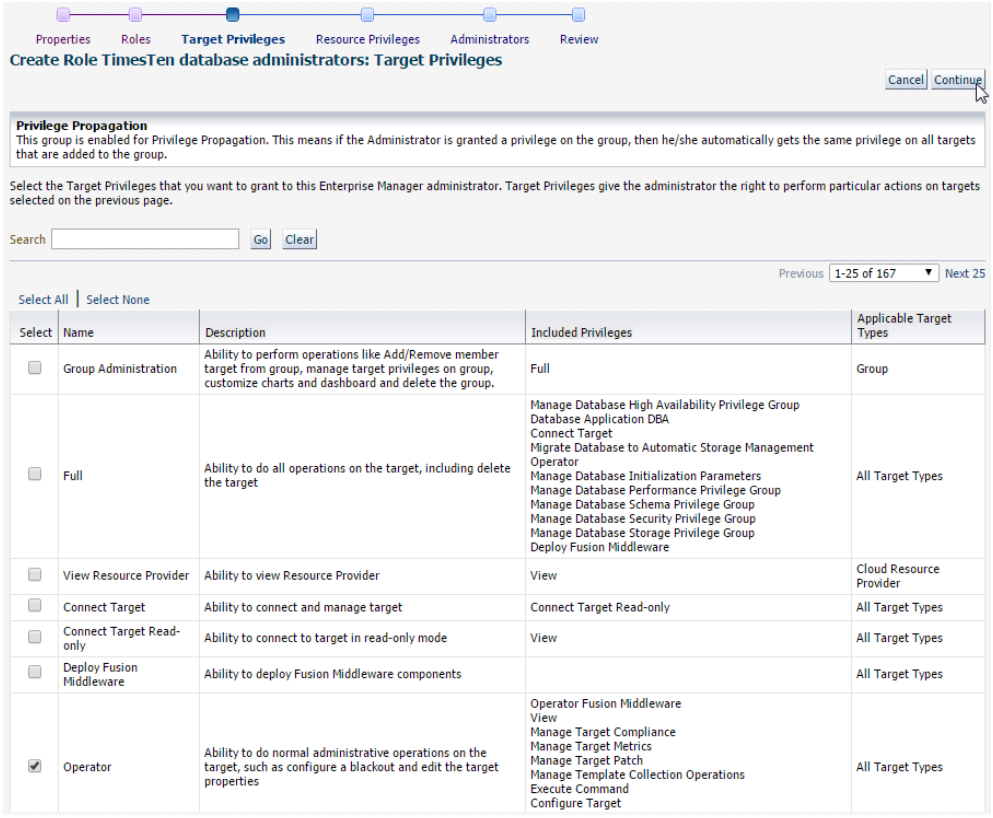
Figure 3–18 Select privileges



Locate the Continue button in the upper right corner of the page.

12. Click **Continue**.

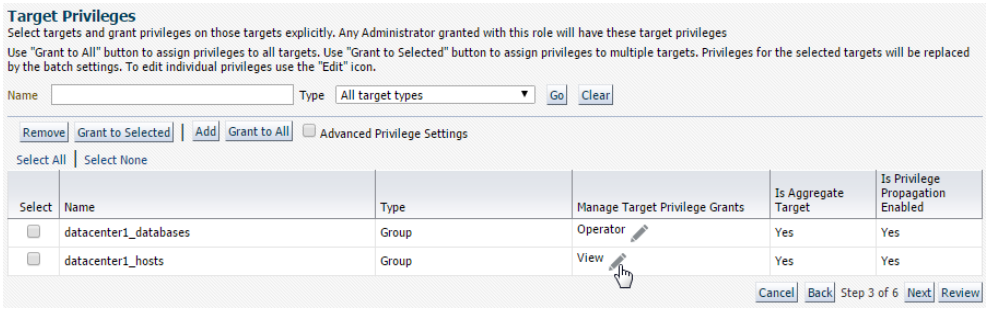
Figure 3–19 Click Continue



The Create Role *role_name*: EM Resource Privileges page displays. In the Target Privileges table, locate the row that contains your host group. In the TimesTen target group row, locate the pencil button in the Manage Target Privilege Grants column.

13. In the host group row, click the **pencil** button in the Manage Target Privilege Grants column.

Figure 3–20 Manage target privilege grants



The Create Role *role_name*: Target Privileges page refreshes. Locate the Target Privileges table.

The Target Privileges table contains all of the available Enterprise Manager privileges that you can assign to a group. Enterprise Manager Cloud Control has a variety of privileges, but only two privileges are important for host operations:

- View

This privilege is needed to view Enterprise Manager host.

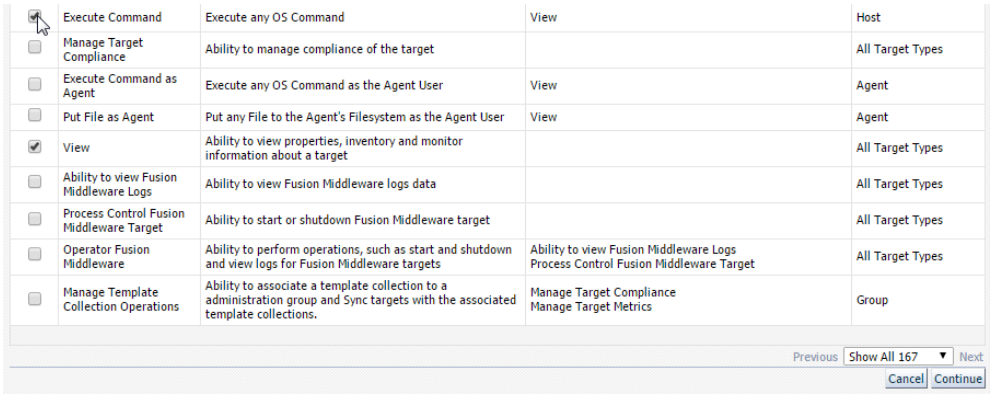
- Execute Command

  This privilege is needed for TimesTen targets to execute operating system commands on a host. The Execute Command privilege is required to control the TimesTen agents, TimesTen database, and TimesTen server, and load and unload the TimesTen database from memory.

Identify the Name of the privilege(s) that you want to assign to this role.

14. Select the check box of the row that identifies the **Name** of the privilege that you want to assign to this group. If you want to add multiple privileges, select the corresponding check box of any additional privilege.

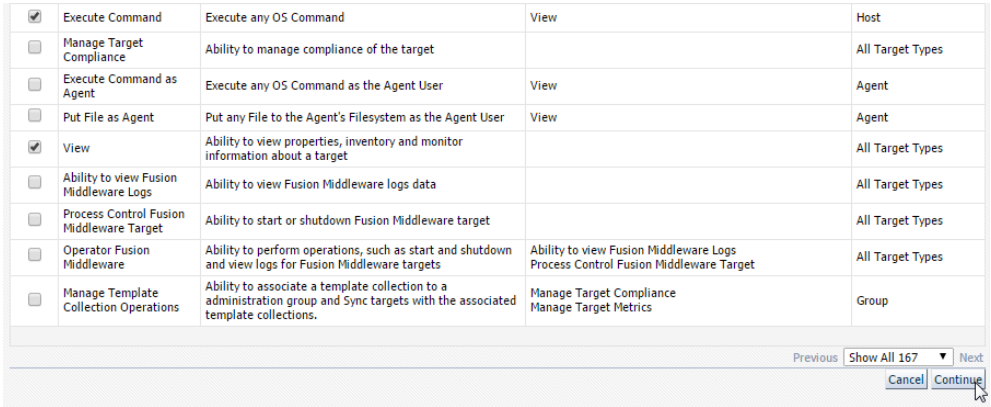
Figure 3–21 Select privileges



Locate the Continue button in the bottom right corner of the page.

15. Click **Continue**.

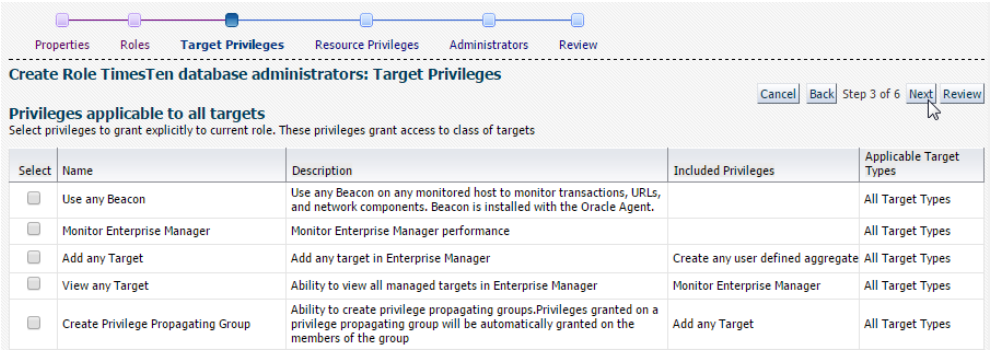
Figure 3–22 Click Continue



The Create Role *role_name*: Target Privileges page displays. Locate the Next button in the upper right corner of the page.

16. Click **Next**.

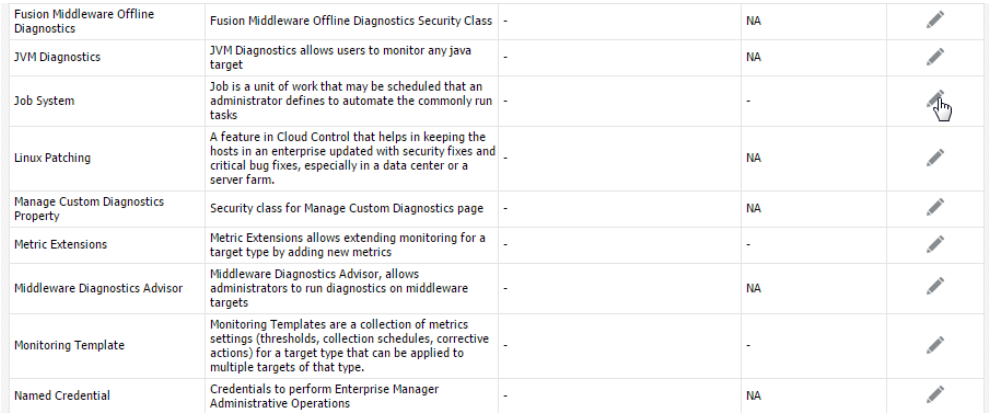
Figure 3–23 Click Next



The Create Role *role_name*: EM Resource Privileges page displays. Locate the resource type list.

17. In the resource type list, locate the row that contains Job System as identified by the Resource Type Column. Click the **pencil** button in the Manage Privilege Grants column.

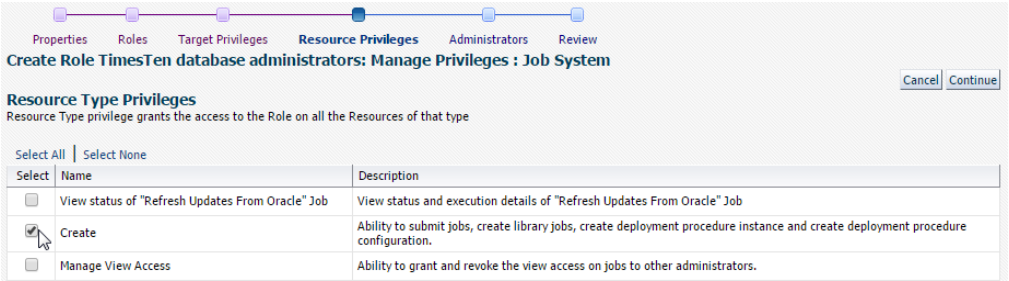
Figure 3–24 Click the pencil button



The Create Role *role_name*: Manage Privileges: Job System page displays. Locate the Resource Type Privileges table.

18. Select the check box of the row that identifies the **Create** privilege.

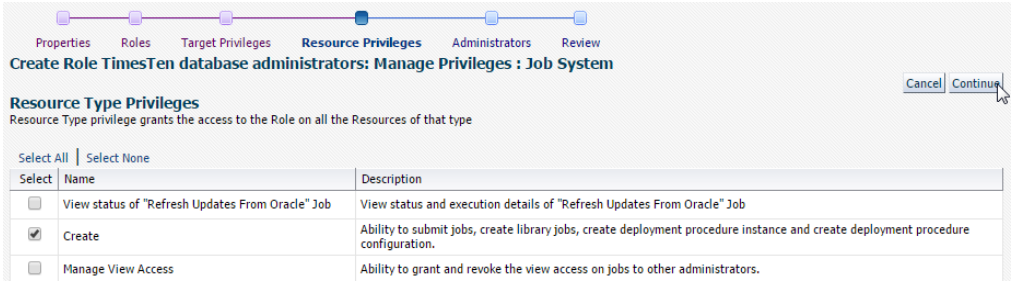
Figure 3–25 Select the check box



Locate the Continue button in the upper right corner of the page.

19. Click **Continue**.

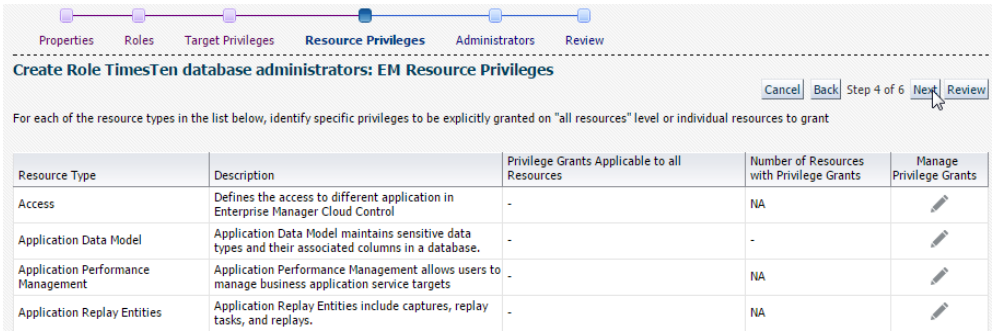
Figure 3–26 Click Continue



The Create Role *role_name*: EM Resource Privileges page displays. Locate the Next button in the upper right corner of the page.

20. Click **Next**.

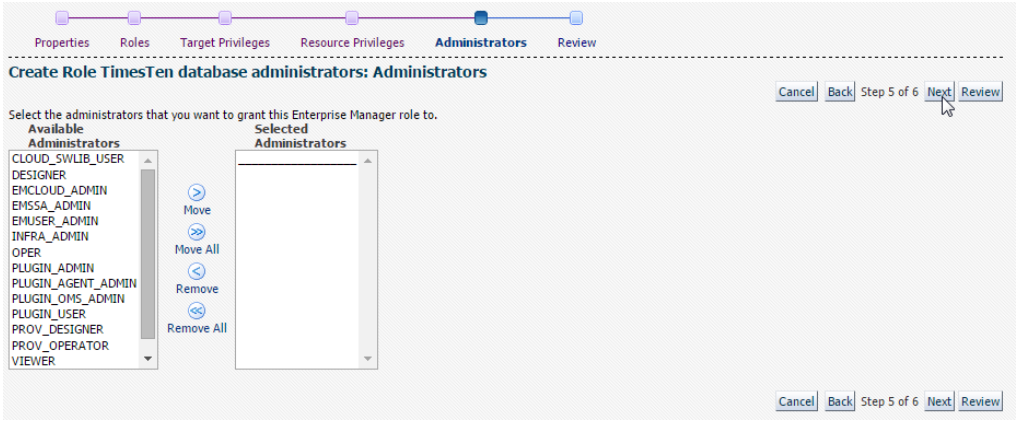
Figure 3–27 Click Next



The Create Role *role_name*: Administrators page displays. Locate the Next button in the upper right corner of the page.

21. Click **Next**.

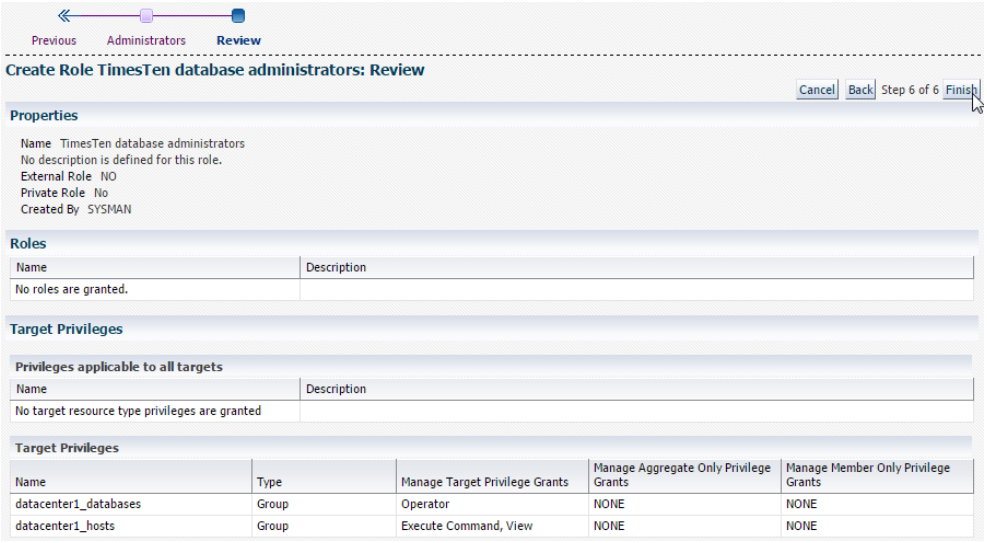
Figure 3–28 Click Next



The Create Role *role_name*: Review page displays. In the Properties region, verify the role name is correct. Also, verify that the correct privileges are in the Privileges applicable to all targets table. Locate the Finish button in the upper right corner of the page.

22. Click **Finish**.

Figure 3–29 Click Finish



The Security Roles page displays with a confirmation message that indicates that you successfully created the Enterprise Manager role.

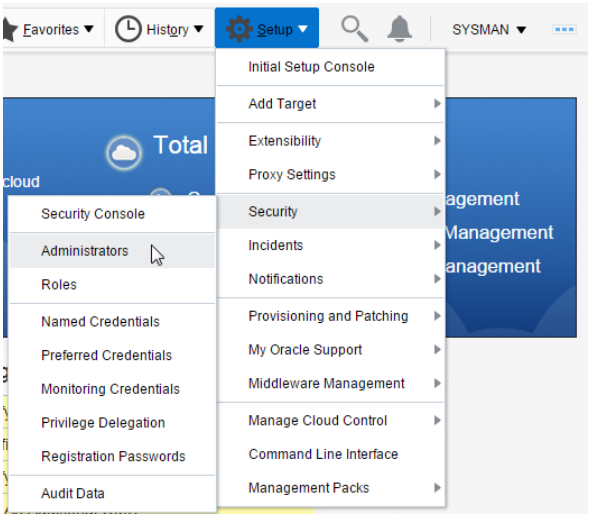
You are now ready to create an Enterprise Manager user.

Creating users

Create a user that can control and view your TimesTen targets.

1. From the **Setup**, select **Security**, then select **Administrators**.

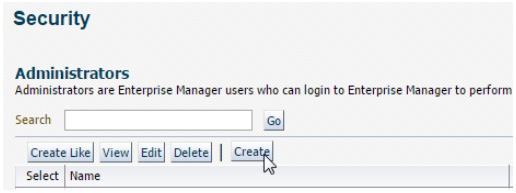
Figure 3–30 Select Administrators



The Security Administrators page displays. Locate the Create button above the group table.

2. Click **Create**.

Figure 3–31 Click Create



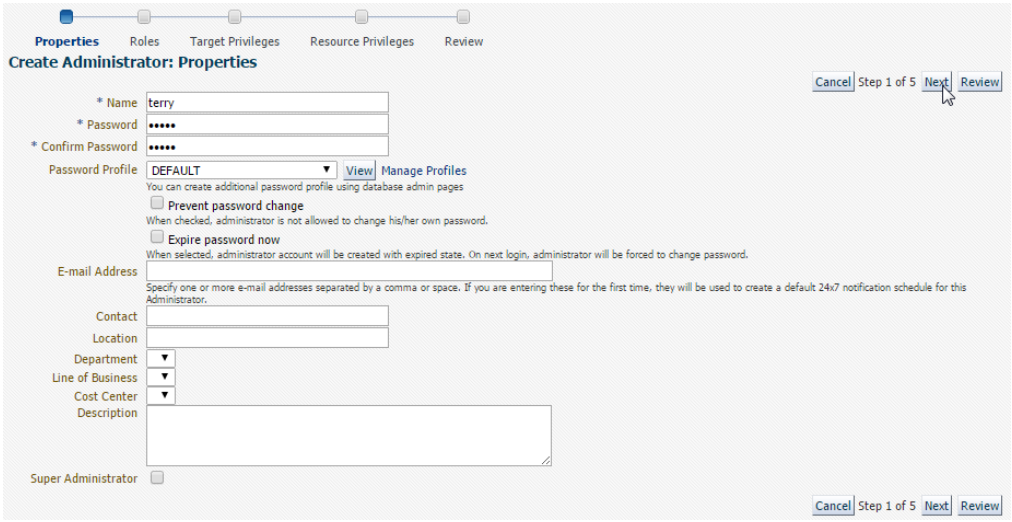
The Create Administrator: Properties page displays. You are now ready to enter the Enterprise Manager user properties. The first property is the user name.

In the *Name text field, you define the user name. Choose a name that is a meaningful identifier. (For example, `terry`.)

3. In the ***Name** text field, type the user name.
4. In the ***Password** text field, type the password for the user.
5. In the ***Confirm Password** text field, re-type the password.

   Locate the Next button in the upper right corner of the page.
6. Click **Next**.

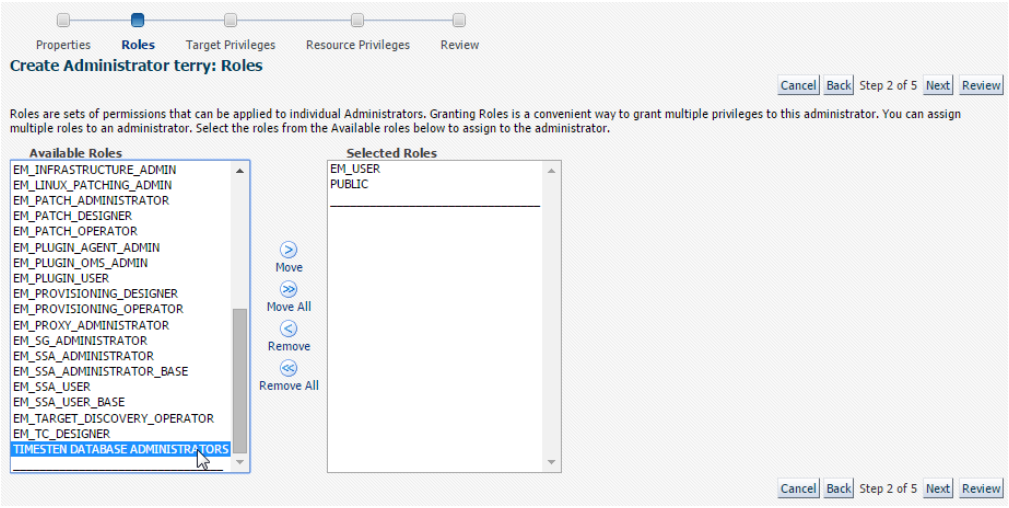
Figure 3–32 Click Next



The Create Administrator *username*: Roles page displays. You are now ready to assign a role to your user.

7. In the Available Roles list, locate the row that contains your TimesTen role. Double click **the role name**. If you want to assign multiple roles, double click the corresponding role name of any additional roles.

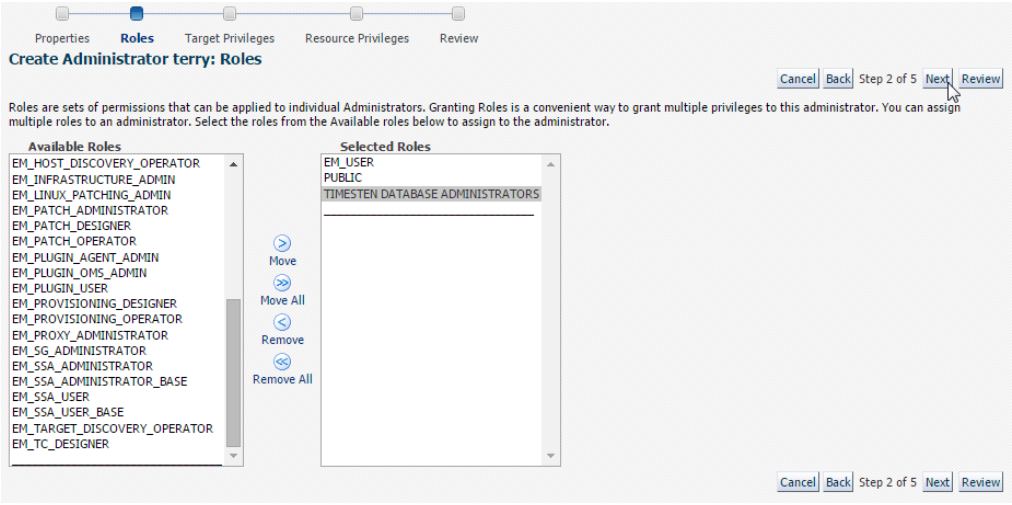
Figure 3–33 Assign a role



Locate the Next button in the upper right corner of the page.

8. Click **Next**.

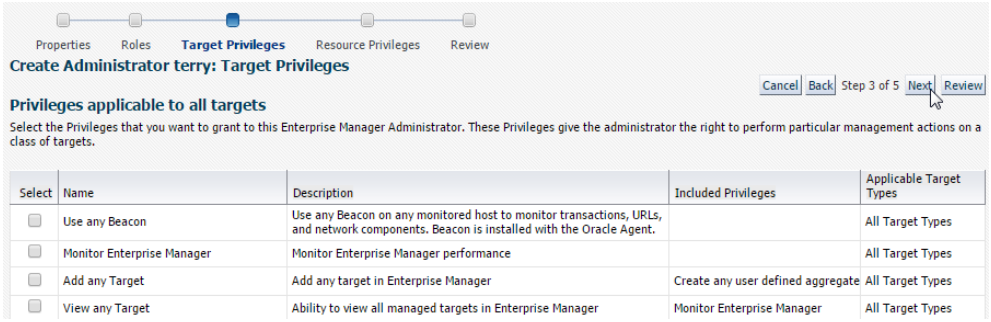
Figure 3–34 Click Next



The Create Administrator *username*: Target Privileges page displays. Locate the Next button in the upper right corner of the page.

9. Click **Next**.

Figure 3–35 Click Next



The Create Administrator *username*: EM Resource Privileges page displays. Locate the Next button in the upper right corner of the page.

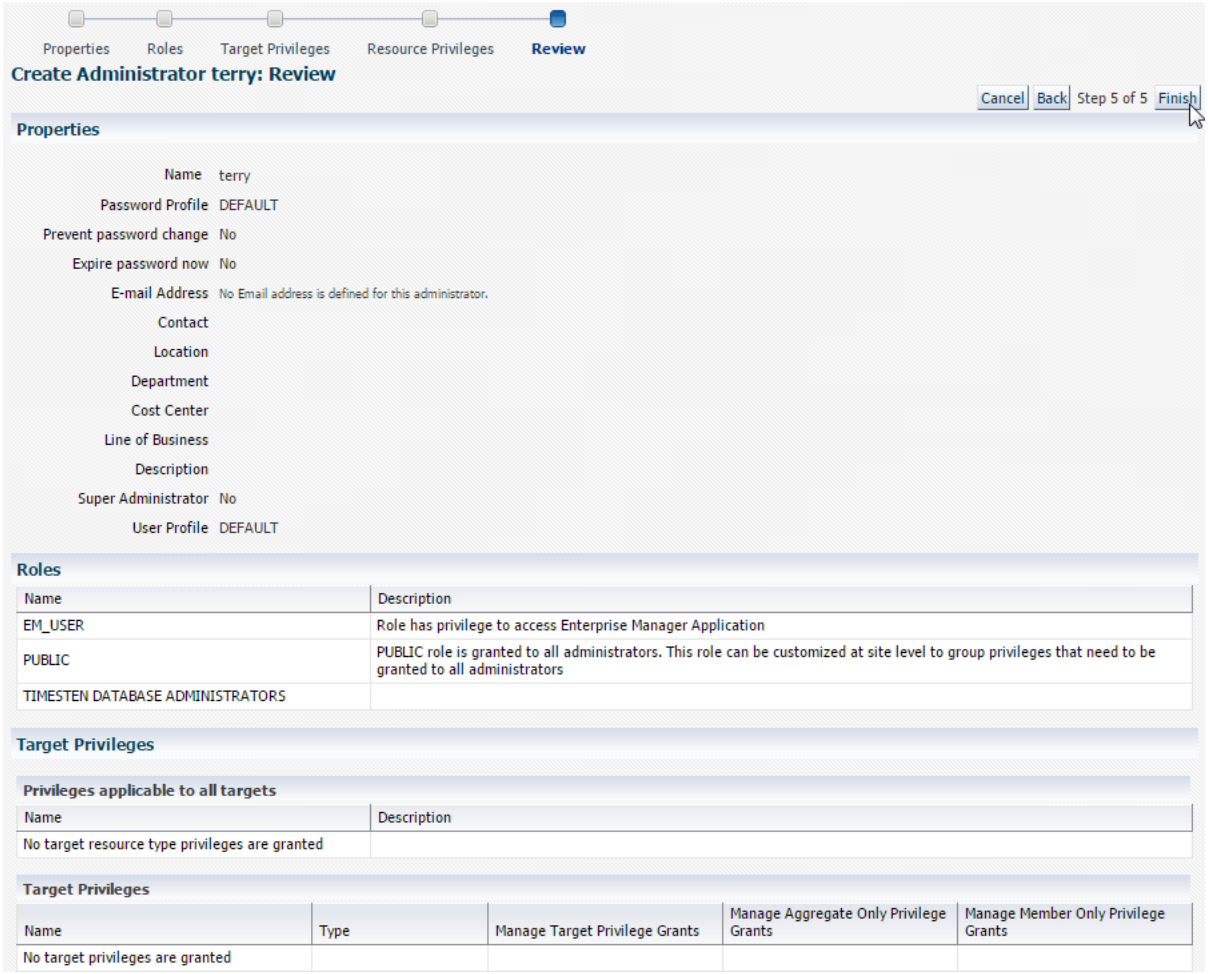
10. Click **Next**.

Figure 3–36 Click Next

The Create Administrator *username*: Review page displays. In the Properties region, verify that the user name is correct. Also, verify that the correct roles are in the Roles table. Locate the Finish button in the upper right corner of the page.

11. Click **Finish**.

Figure 3–37 Click Finish



The Security Administrators page displays with a confirmation message that indicates that you successfully created the Enterprise Manager user.

You have successfully created an Enterprise Manager user that can view and control TimesTen targets.

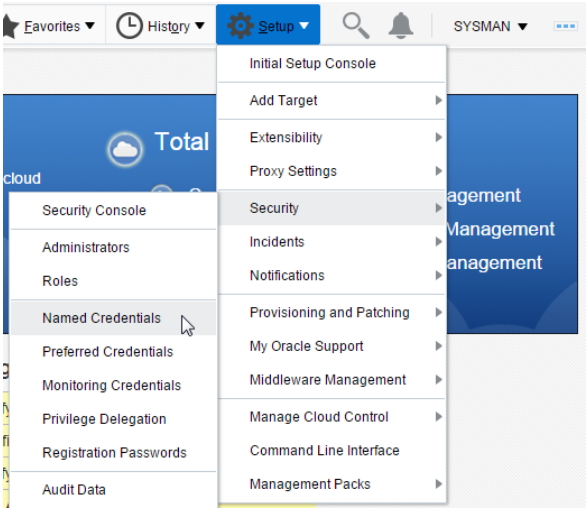
Granting preferred credentials to users

Enterprise Manager enables you to grant a user access to preferred credentials that you created for a target with the `SYSMAN` user. Target preferred credentials are required to perform several operations on TimesTen targets. Ensure that you have set preferred credentials for the `SYSMAN` user before proceeding with this section. For more information, see "Setting preferred credentials for a target" on page 1-36.

To grant a user access to preferred credentials, ensure that you are on the Oracle Enterprise Manager Cloud Control home page and are logged in as user `SYSMAN`.

1. From the **Setup** menu, select **Security**, then select **Named Credentials**.

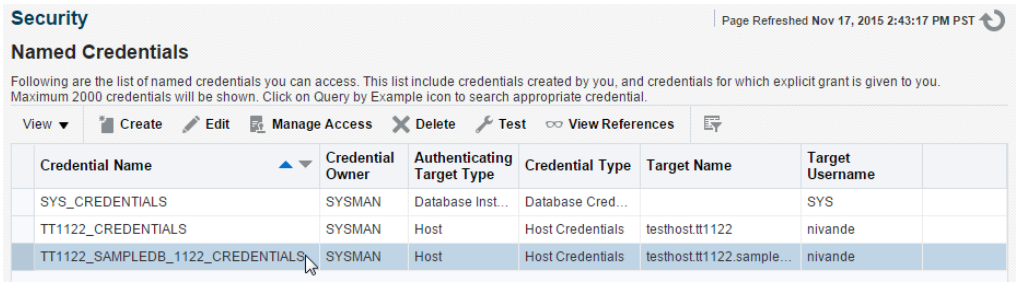
Figure 3–38 Select Named Credentials



The Security Named Credentials page displays. Locate the credential name in the Credential Name column.

2. Click the **credential name**.

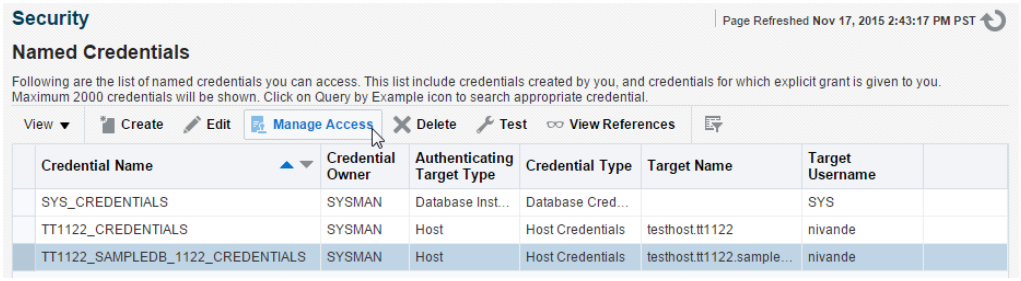
Figure 3–39 Select credential name



You are now ready to grant the preferred credentials to a user. Locate the Manage Access button.

3. Click **Manage Access**.

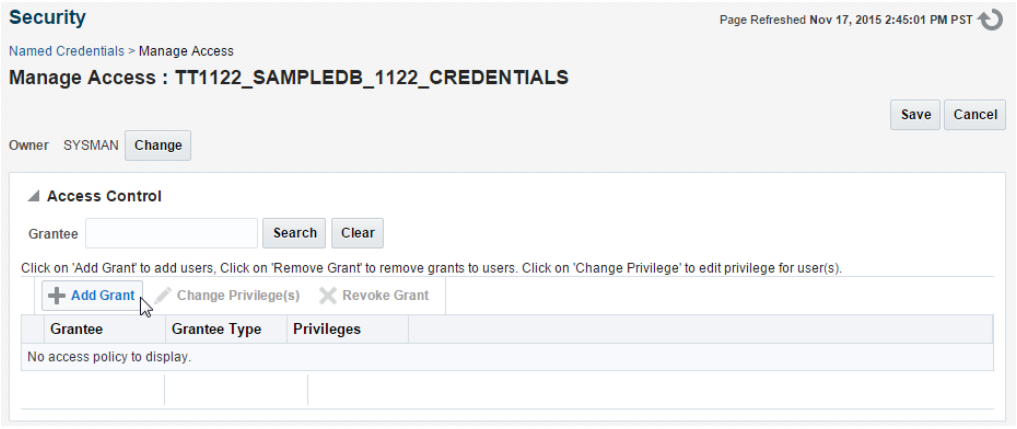
Figure 3–40 Click Manage Access



The Security Manage Access: *credential_name* page displays. Locate the Add Grant button in the Access Control region.

4. Click **Add Grant**.

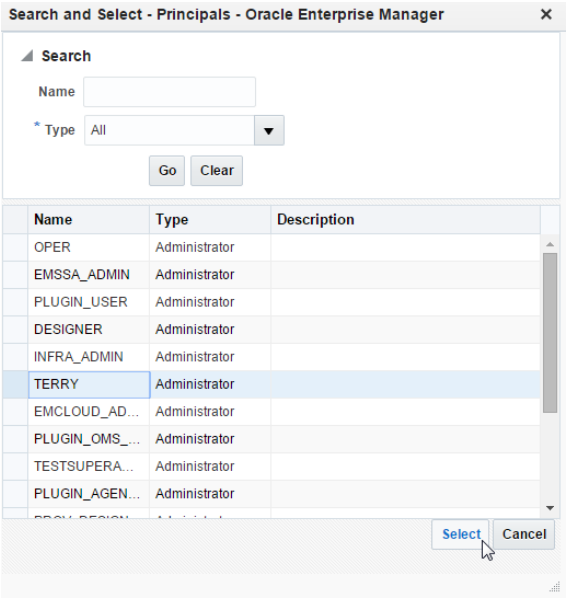
Figure 3–41 Click Add Grant



The Search and Select - Principals - Oracle Enterprise Manager dialog displays.

5. In the dialog, locate the row that contains the correct user name. Click **in this row** and click **Select**.

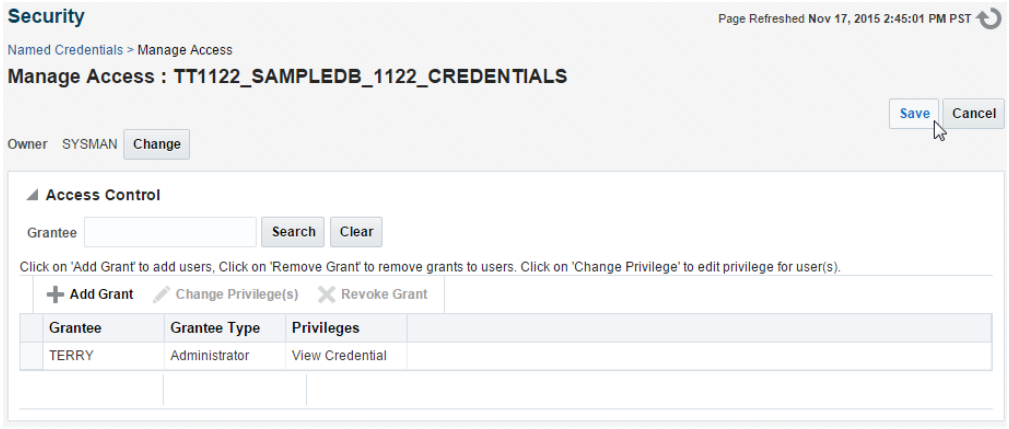
Figure 3–42 Select user name



The Search and Select - Principals - Oracle Enterprise Manager dialog closes and the Security Manager Access: *credential_name* page refreshes. You should see your selected user name in the table in the Access Control region. Locate the Save button in the upper right corner of the page.

6. Click **Save**.

Figure 3–43 Click Save



The Security Named Credentials page displays. Repeat steps 1-6 to grant access to additional preferred credentials to users.

7. To enable preferred credentials on an Enterprise Manager user account, logon to Enterprise Manager using the user credentials. Then, follow the instructions in "Setting preferred credentials for a target" on page 1-36 and assign the existing named credentials as noted in step 6.

You have successfully granted a user access to preferred credentials of a `SYSMAN` user target.

4

Working with the TimesTen Instance Home Page

This chapter describes the TimesTen instance home page. The home page conveys high level information about the TimesTen instance.

Topics include:

- Viewing the TimesTen instance home page
- Analyzing information on the TimesTen instance home page

Viewing the TimesTen instance home page

To view the home page, ensure that you are on the TimesTen instance target page. For information on navigating to the TimesTen instance target page, see "Navigating to the TimesTen target page" on page 2-1.

From the **TimesTen Instance Home** menu, select **Home**.

The TimesTen home page displays.

Analyzing information on the TimesTen instance home page

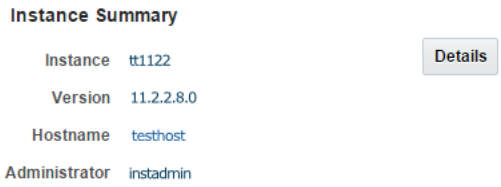
The TimesTen instance home page consists of four regions each of which has been customized specifically for TimesTen instance targets.

The four home page regions described in detail include:

- Instance summary
- Daemon status
- Server status
- Hosted databases

Instance summary

Figure 4–1 Instance summary region



This region shows information about your TimesTen instance target:

- Instance

  The name of your current TimesTen instance.

- Version

  The version of your current TimesTen instance.

- Hostname

  The name of the host where TimesTen is running. This is a link that lets you view the host target page.

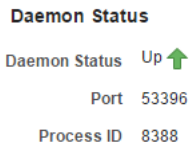
- Administrator

  The operating system username of the TimesTen instance administrator.

Click the **Details** button to view additional details about your TimesTen instance. The TimesTen instance target needs preferred credentials to display additional instance details. For more information on setting preferred credentials, see "Setting preferred credentials for a target" on page 1-36. The detailed instance information dialog displays the output of the `ttVersion -m` utility. For more information on the `ttVersion` utility and its output, see "ttVersion" in the *Oracle TimesTen In-Memory Database Reference*.

Daemon status

Figure 4–2 Daemon status region



This region shows information about the TimesTen daemon:

- Daemon status

  This value can be either Up or Down. The TimesTen daemon need to be Up to use the TimesTen instance and TimesTen database. For more information on how to start and stop the TimesTen daemon, see "Start/stop services" on page 9-1.

- Port

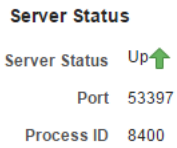
The port number on which the TimesTen daemon listens. If this port number causes conflicts with another application, consider using the `ttInstanceModify -port` utility to modify the TimesTen daemon port number. For more information, see "ttInstanceModify" in the *Oracle TimesTen In-Memory Database Reference*.

- Process ID

  The process identifier of the TimesTen daemon process.

Server status

Figure 4–3 Server status region



This region shows information about the TimesTen server:

- Server status

  This value can be either Up or Down. The TimesTen server need to be Up for TimesTen databases that belong to this TimesTen instance to accept client/server connections. For more information on how to start and stop the TimesTen server, see "Start/stop services" on page 9-1.

- Port

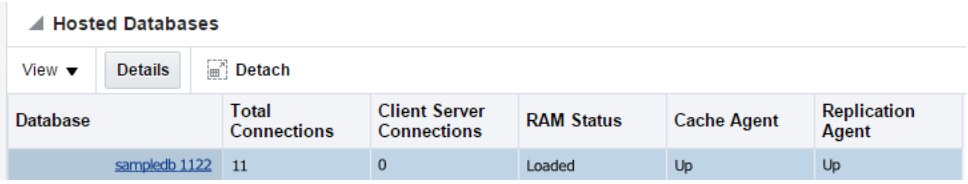
  The port number on which the TimesTen server listens. If this port number causes conflict with another application, consider modifying the TimesTen server port number. For more information, see "Modifying the TimesTen Server attributes" in the *Oracle TimesTen In-Memory Database Operations Guide*.

- Process ID

  The process identifier of the TimesTen server process.

Hosted databases

Figure 4–4 Hosted databases region



This region shows the databases that are part of your TimesTen instance in a table format. This information is useful in determining the status of all of the databases associated with this TimesTen instance.

A description of each column follows:

- Database

This value is taken from the last part of the path to the datastore. For example, if the path to the datastore is `/var/tt/sampledb_1122`, the database name is `sampledb_1122`.

If the database is a TimesTen database target you can click the database name to open the home page of the TimesTen database target. For more information on the TimesTen database home page, see "Working with the TimesTen Instance Home Page" on page 4-1.

- Total Connections

  The total number of direct linked and client/server connections to the database.

- Client Server Connections

  The number of client/server connections to the database.

- RAM Status

  This value can be either Loaded or Not loaded. The RAM status is Loaded if the database is loaded into memory.

- Cache Agent

  This value can be either Up or Down. If you have not configured a cache group, then this value is Down. The Cache Agent is used for read or write caching of data in an Oracle 11*g* or 12*c* database. For more information, on how to start and stop the cache agent, see "Start/stop agents" on page 10-1.

- Replication Agent

  This value can be either Up or Down. If you have not configured a replication scheme, then this value is Down. TimesTen uses the Replication Agent to either replicate data between TimesTen databases or to asynchronously write data to an Oracle 11*g* or 12*c* database. For more information, on how to start and stop the cache agent, see "Start/stop agents" on page 10-1.

- PLSQL

  This value can be either Enabled or Disabled. By default, this column is hidden. To enable this column, click the **View** button, then **Columns**, and then click the **PLSQL** option.

  In addition, you can select a row and click **Details** to view all of the connections to a certain database. If you click **Details**, a **Current Connections** dialog opens showing the connections to the database. The Current Connections dialog displays the connection output of the `ttStatus` *`DSN`* utility. For more information on the `ttStatus` utility and its output, see "ttStatus" in the *Oracle TimesTen In-Memory Database Reference*.

5

Working with the TimesTen Database Home Page

This chapter describes the TimesTen database home page. The TimesTen database home page conveys high level configuration and performance information about your TimesTen database.

Topics include:

- Viewing the TimesTen home page
- Analyzing information on the TimesTen home page

Viewing the TimesTen home page

To view the home page, ensure that you are on the TimesTen database target page. For information on navigating to the TimesTen database target page, see "Navigating to the TimesTen target page" on page 2-1.

From the **TimesTen Database Home** menu, select **Home**.

The TimesTen database home page displays.

Analyzing information on the TimesTen home page

The TimesTen home page consists of three regions each of which has been customized specifically for TimesTen database targets.

The three home page regions described in detail include:

- Status and Summary
- Performance Overview and Issues
- SQL Execution Time and Monitor

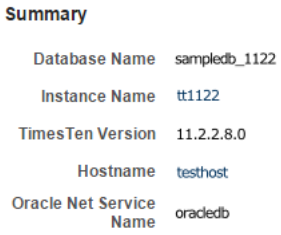
Status and Summary

The Status and Summary region consists of three subregions:

- Summary
- Status
- Configuration

Summary

Figure 5–1 Summary region



This region shows information about your TimesTen target:

- Database name

  This value is taken from the last part of the path to the database. For example, if the path to the database is `/var/tt/sampledb_1122`, the database name is `sampledb_1122`.

- Instance name

  The name of your current TimesTen instance. This is a link that lets you view the TimesTen instance target page.

- TimesTen version

  The version of your current TimesTen instance.

- Hostname

  The name of the host where TimesTen is running. This is a link that lets you view the host target page.

- Oracle Net Service Name

  The service name of the Oracle database used for cache and to load data from an Oracle database into the TimesTen database. If you have not configured the Oracle Net Service Name, then this value is Not Specified.

Status

Figure 5–2 Status region

This region shows status information including:

- TimesTen Server

  This value can be either Up or Down. The TimesTen Server is the listener process that enables client/server connections to the database. For more information on how to start and stop the TimesTen server, see "Start/stop services" on page 9-1.

- Cache Agent

This value can be either Up or Down. If you have not configured a cache group, then this value is Down. The Cache Agent is used for read or write caching of data in an Oracle database. For more information, on how to start and stop the cache agent, see "Start/stop agents" on page 10-1.

- Replication Agent

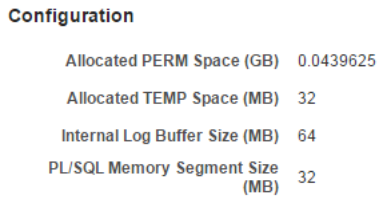
  This value can be either Up or Down. If you have not configured a replication scheme, then this value is Down. TimesTen uses the Replication Agent to either replicate data between TimesTen databases or to asynchronously write data to an Oracle database. For more information, on how to start and stop the replication agent, see "Start/stop agents" on page 10-1.

- Loaded Since

  The date and time when the database was loaded into memory.

Configuration

Figure 5–3 Configuration region



This region shows configuration information specific to your database. These attributes are first connection attributes and the values are set at first connect. For more information on first connection attributes, see "Connection Attributes" in the *Oracle TimesTen In-Memory Database Reference*.

- Allocated PERM Space
- Allocated TEMP Space
- Internal Log Buffer Size
- PL/SQL Memory Segment Size

Performance Overview and Issues

The Performance Overview and Issues region consists of two tabs:

- Performance Overview
- Issues

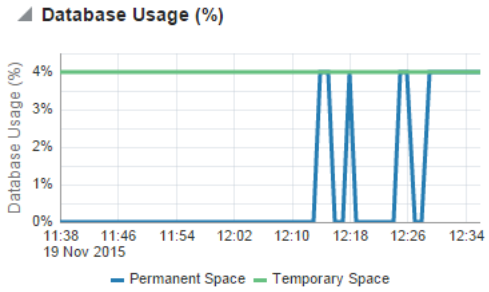
Performance Overview

The Performance Overview region consists of three subregions:

- Database Usage (%)
- Database Connections
- Free Space (%)

Database Usage (%)

Figure 5–4 Database Usage region



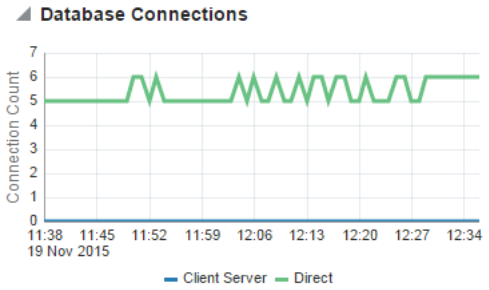
This region uses a line graphs to show permanent and temporary space currently in use. The values are expressed as a percentage of what was configured at database first connect. For information on the configured values, see the Summary, Status, and Configuration regions.

The X-Axis represents time. The Y-Axis represents the percent of permanent space in use and the percent of temporary space in use.

High database usage may indicate the need to grow the database by allocating more permanent or temporary space.

Database Connections

Figure 5–5 Database connections region

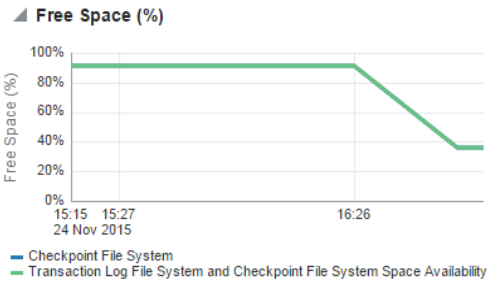


This region uses a line graph to show the number of direct linked connections and client/server connections. These line graphs change according to time to show not only the current value but also the values collected in recent metric collections.

The X-Axis represents time. The Y-Axis represents the number of current direct linked connections and the number of client/server connections. These connections do not include subdaemon connections or connections created by the TimesTen plug-in to collect configuration and performance data.

Free Space (%)

Figure 5–6 Free Space region



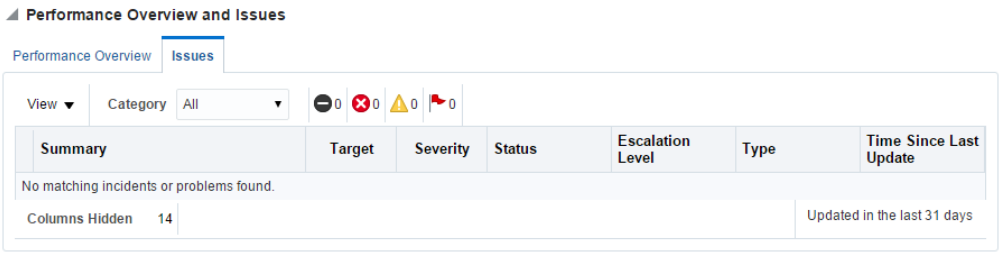
This region uses a graph to show the free space in the file systems where the checkpoint and transaction log files are currently located.

The X-Axis represents time. The Y-Axis represents the free space in the checkpoint file system and the free space in the transaction log file system. If you configured the checkpoint and transaction log files in the same file system and path, the two lines will be on top of each other and you will see one line.

A very low percentage of free disk available may indicate a need to install a larger disk.

Issues

Figure 5–7 Issues region



This region displays alerts that have exceeded either warning or error thresholds.

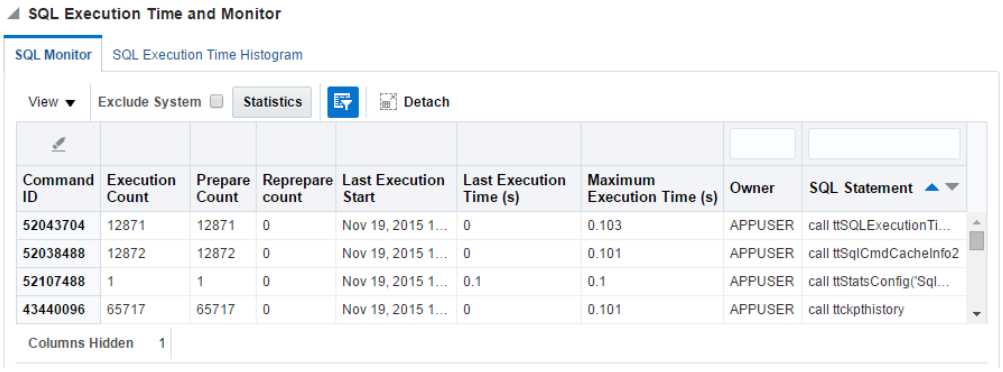
SQL Execution Time and Monitor

The SQL Execution Time and Monitor consists of two tabs.

- SQL Monitor
- SQL Execution Time Histogram

SQL Monitor

Figure 5–8 SQL Monitor region



This regions shows the top SQL statements in the SQL command cache expressed in table format. This information is useful in analyzing your queries. It may be useful to sort by the number of executions to see the SQL statements that are most executed. It may also be useful to exclude system SQL commands by clicking in the box to the left of **Exclude System**.

As you review the top executions, look at the values in the Prepare Count column. If the SQL query is not prepared, then you should prepare the query. For optimal performance, a SQL statement should be prepared once and executed many times. If the number of prepares for a SQL statement is large then verify if your application can be enhanced to minimize the number of prepares per SQL statement.

Click the **Statistics** button at the top of the table to view the number of cached commands and the current space allocated to store cached commands. This information is derived from the output values of the `ttSQLCmdCacheInfo` built-in procedure. For more information about the `ttSQLCmdCacheInfo` built-in procedure, see "ttSQLCmdCacheInfo" in the *Oracle TimesTen In-Memory Database Reference*.

Click the **Query By Example** at the top of the table to enable query fields for the Owner and SQL Statement columns.

In addition, you can review the queries in the SQL Statement column. You can copy and paste this SQL query into the worksheet in SQL Developer and review the results from **Explain Plan**. You can also paste the SQL query into `ttIsql` and look at the `showplan` for the query. This may give you a better understanding of how and why your queries are performing as they are.

You can also click the column header to sort the table based on the column. A description of each column follows:

Note: The columns are sorted based on the rows that are currently loaded in the SQL Monitor table. To sort the table based on all the rows from the `ttSQLCmdCacheInfo` built-in procedure, ensure that you are viewing data in Real Time. For more information on viewing data in Real Time, see "View data" on page 2-5.

- **Command ID**

  A unique identifier for the SQL command. The TimesTen database generates this number.

- **Execution Count**

  A counter for the number of executions that took place on this command since it was brought into the command cache.

- **Prepare Count**

  A counter for the number of prepares for a SQL statement.

- **Reprepare count**

  A counter of the number of reprepares.

- **Last Execution Time (s)**

  The last execution time for a SQL statement.

- **Maximum Execution Time (s)**

  The maximum execution time for a SQL statement.

- **Owner**

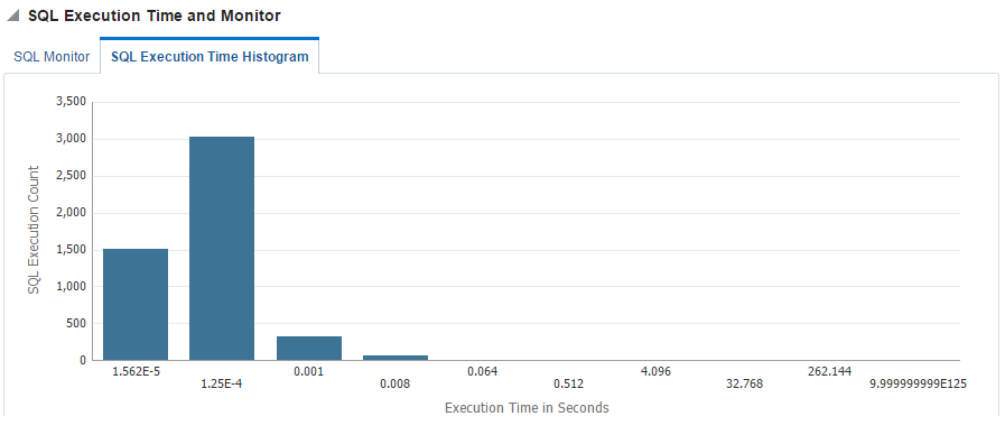
  The identifier of the user who created the command.

- **SQL Statement**

  The SQL text.

SQL Execution Time Histogram

Figure 5–9 SQL Execution Time Histogram region



This region shows a histogram with the number of SQL commands that have been executed since command cache sampling has been enabled. The histogram is populated with output of the `ttSQLExecutionTimeHistogram` built-in procedure. For more information on the `ttSQLExecutionTimeHistogram` built-in procedure, see "ttSQLExecutionTimeHistogram" in the *Oracle TimesTen In-Memory Database Reference*.

The histogram is populated when the TimesTen database is configured to take sample SQL command cache. To enable TimesTen to take sample SQL command caches, call the `ttStatsConfig` built-in procedure with the `SQLCmdSampleFactor` parameter set to a value that is between 0 and 60000. For more information about the `ttStatsConfig` built-in procedure, see "ttStatsConfig" in the *Oracle TimesTen In-Memory Database Reference*.

For example, call the `ttStatsConfig` built-in procedure with the following parameters and values to enable command cache sampling for every single SQL command:

```
Command> call ttStatsConfig('SqlCmdSampleFactor',1);
< SQLCMDSAMPLEFACTOR, 1 >
1 row found.
```

The histogram has the following fixed interval times:

- 0 seconds to .00001562 seconds
- .00001562 seconds to .000125 seconds
- .0000125 seconds to .001 seconds
- .001 seconds to .008 seconds
- .008 seconds to .064 seconds
- .064 seconds to .512 seconds
- .512 seconds to 4.096 seconds
- 4.096 seconds to 32.768 seconds
- 32.768 seconds to 262.144 seconds
- 262.144 seconds to 9.999999999E+125 seconds

To reset the SQL execution time histogram, call the `ttStatsConfig` built-in procedure with the `SQLCmdHistogramReset` parameter set to a value that is not 0. For more information about the `ttStatsConfig` built-in procedure, see "ttStatsConfig" in the *Oracle TimesTen In-Memory Database Reference*.

For example, call the `ttStatsConfig` built-in procedure with the following parameters and values to reset the SQL execution time histogram:

```
Command> call ttStatsConfig('SQLCmdHistogramReset',1);
< SQLCMDHISTOGRAMRESET, 1 >
1 row found.
```

6

Working with the Performance Summary Page

This chapter describes the TimesTen performance summary page. The performance summary page displays performance specific information that has been customized for your TimesTen database targets.

Topics include:

- Viewing the performance summary page
- Analyzing information on the TimesTen performance summary page

Viewing the performance summary page

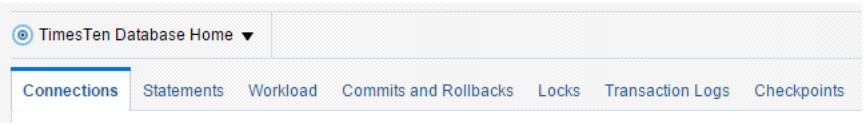
To view the performance summary page, ensure that you are on the TimesTen database target page. For information on navigating to the TimesTen database target page, see "Navigating to the TimesTen target page" on page 2-1.

From the **TimesTen Database Home** menu, select **Monitoring**, then select **Performance Summary**.

Analyzing information on the TimesTen performance summary page

Figure 6–1 shows the seven performance specific areas that have been customized for your TimesTen database targets. Click a specific tab to view detailed performance information.

Figure 6–1 Performance tabs



A description of each area follows:

- Connections
- Statements
- Workload
- Commits and rollbacks
- Locks
- Transaction Logs
- Checkpoints

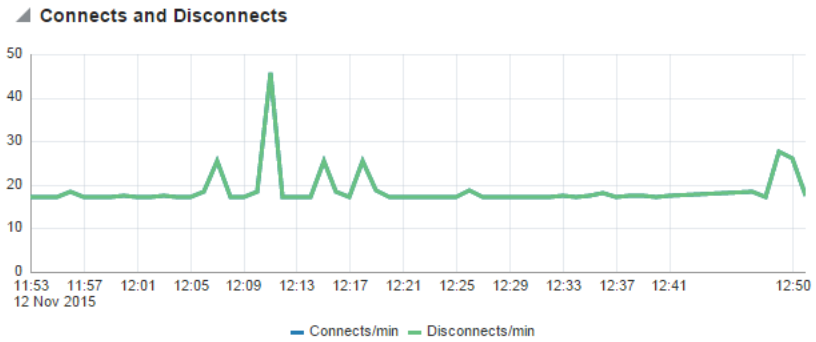
Connections

The connections tab enables you to view information about database connections and disconnections. The connections tab contains one graph region:

- Connects and disconnects

Connects and disconnects

Figure 6–2 Connects and disconnects region



The connects and disconnects rates region uses a line graph to show the number of connects and disconnect per minute.

The X-Axis represents time. The Y-Axis represents the number of connects and disconnects per minute. These numbers represent all connects and disconnects from applications and connections created by the TimesTen plug-in to collect configuration and performance data.

If you see a high rate of connects and disconnects, then investigate why you are seeing this high rate. You may consider modifying your applications to do connection pooling.

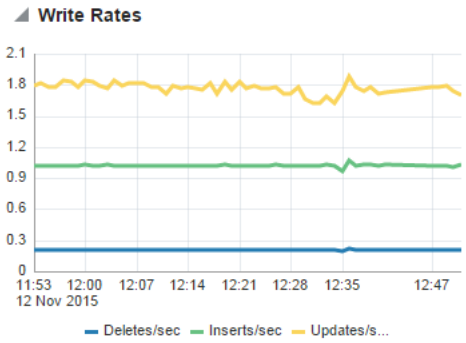
Statements

The statements tab enables you to compare and review the execution rates of your SQL statements. It is divided into four regions:

- Write rates
- Read rates
- Ratio of prepares to executes
- Break up of executed statement types

Write rates

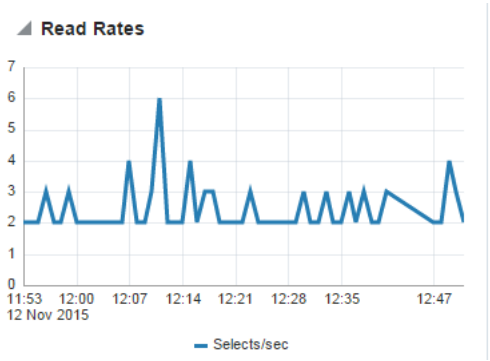
Figure 6–3 Write Rates region



The write rates region uses a line graph to show the rate of `INSERT`, `UPDATE`, and `DELETE` statements executed per second.

Read rates

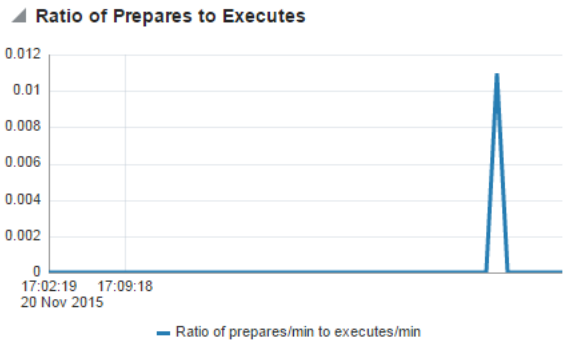
Figure 6–4 Read Rates region



The read rates region uses a line graph to show the rate of `SELECT` statements executed per second.

Ratio of prepares to executes

Figure 6–5 Ratio of Prepares to Executes region



The ratio of prepare to execute rates region uses a line graph to show the overall performance of the statements that are executing.

If SQL statements are prepared for every execute, the ratio of prepares to executes is equal to a value of 1.0. This type of ratio impacts performance. Preparing SQL statements is CPU intensive. Try to minimize the number of times your SQL statements are prepared. In your applications, consider using bind variables. You can then prepare your SQL statements once and then execute your SQL statements multiple times.

A value less than 1.0 means that there are more executes than prepares. When this occurs, the statements being executed are already in the SQL command cache and are already prepared. This results in less work that must be done to execute the statement.

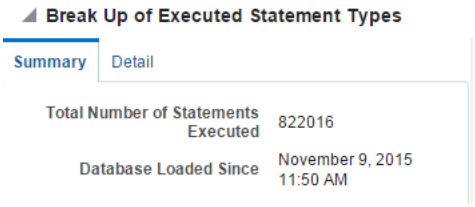
Break up of executed statement types

The break up of executed statement types region displays information about executed statements. The region is divided into two sub-regions:

- Summary
- Detail

Summary

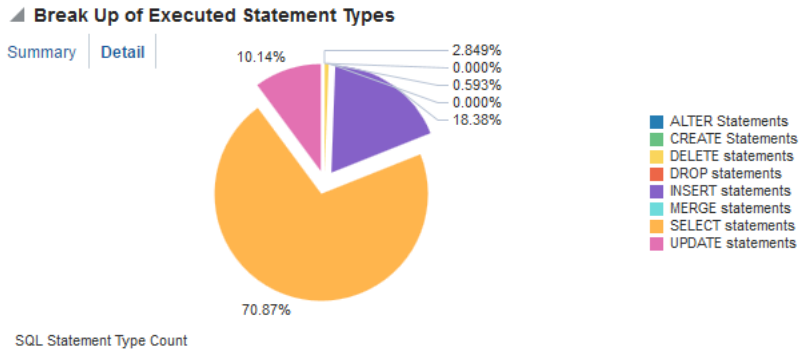
Figure 6–6 Summary sub-region



The summary sub-region shows the total number of SQL statements that have been executed since the database has been loaded into memory. There is also a field that shows the date and time when the database was loaded into memory.

Detail

Figure 6–7 Detail sub-region



The detail sub-region has a pie chart that shows the types of SQL statements that have executed since your TimesTen database target was loaded into memory.

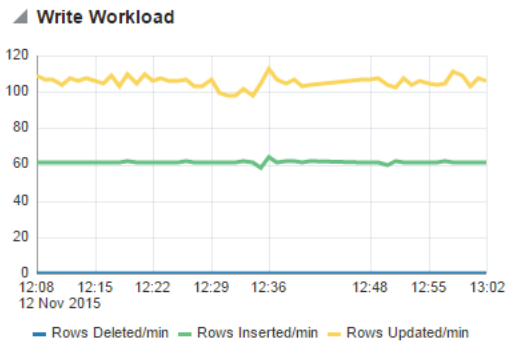
Workload

The workload tab shows the workload of your TimesTen target. The page is divided into two regions:

- Write workload
- Read workload
- Prepares and reprepares

Write workload

Figure 6–8 Write Workload region



The write workload region uses a line graph to show the number of table rows deleted, inserted, and updated per minute.

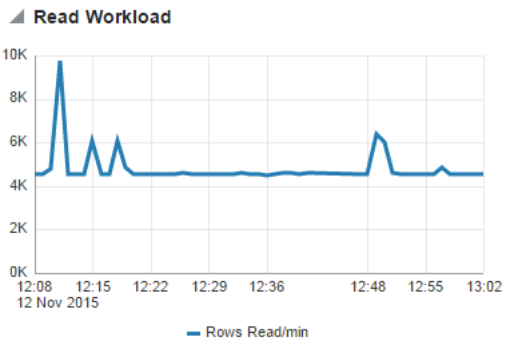
The write workload region is populated when the TimesTen database is enabled to collect all database and operating system statistics. To enable TimesTen to collect all database and operating system statistics, call the `ttStatsConfig` built-in procedure with the `StatsLevel` parameter set to `ALL`.

```
Command> call ttStatsConfig('StatsLevel','ALL');
< STATSLEVEL, ALL >
1 row found.
```

For more information about the `ttStatsConfig` built-in procedure, see "ttStatsConfig" in the *Oracle TimesTen In-Memory Database Reference*.

Read workload

Figure 6–9 Read Workload region



The read workload region uses a line graph to show the number of table rows read per minute.

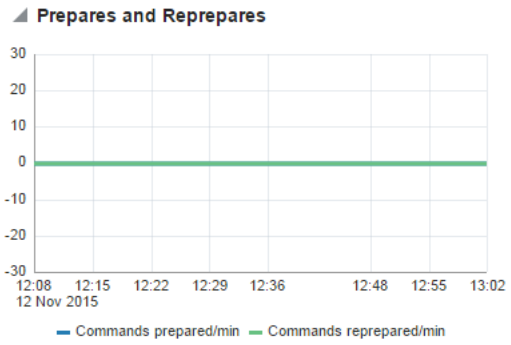
The read workload region is populated when the TimesTen database is enabled to collect all database and operating system statistics. To enable TimesTen to collect all database and operating system statistics, execute the `ttStatsConfig` built-in procedure with the `StatsLevel` parameter set to `ALL`.

```
Command> call ttStatsConfig('StatsLevel','ALL');
< STATSLEVEL, ALL >
1 row found.
```

For more information about the `ttStatsConfig` built-in procedure, see "ttStatsConfig" in the *Oracle TimesTen In-Memory Database Reference*.

Prepares and reprepares

Figure 6–10 Prepares and reprepares

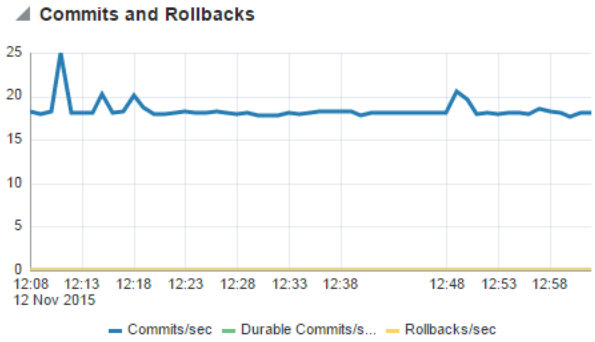


The prepares and reprepares region uses a line graph to show the number of commands prepared per minute and the number of commands reprepared per minute. If you see a high number of reprepared commands per minute, then this is an indication that there are invalidations occurring. This results in performance degradation.

In your applications, consider using bind variables and prepare your SQL statement once. You can then execute the SQL statement multiple times. If you do this, the number of commands prepared per minute should approach zero.

Commits and rollbacks

Figure 6–11 Commits and rollbacks region



The commits and rollbacks region uses a line graph to show the relationship between durably committed transactions, committed transactions, and rollbacks.

The X-Axis represents time. The Y-Axis represents the rate of transactions durably committed, non-durably committed, and rolled back per second.

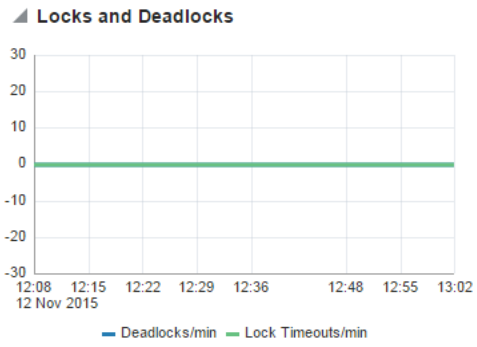
Locks

The locks page shows information related to the performance of the locks and concurrent operations of your TimesTen database target. It contains three regions:

- Locks and deadlocks
- Lock grants
- Percentage of acquired locks without wait

Locks and deadlocks

Figure 6–12 Locks and Deadlocks region



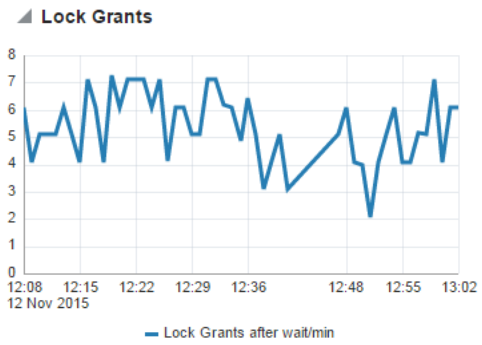
The locks and deadlocks region uses a line graph to show the rate of deadlocks per minute and the lock timeouts per minute.

The deadlock rate should be as low as possible. If you see a continued or growing rate of deadlocks, review the way in which your application acquires resources. If the deadlock rate is greater than zero, review the "Working with the Transaction Monitor" on page 7-1.

Lock timeouts per minute should be low. If the lock timeouts per minute is not low, then this is an indication there is contention for the same resource. To find out what is causing the lock timeouts, review the "Working with the Transaction Monitor" on page 7-1.

Lock grants

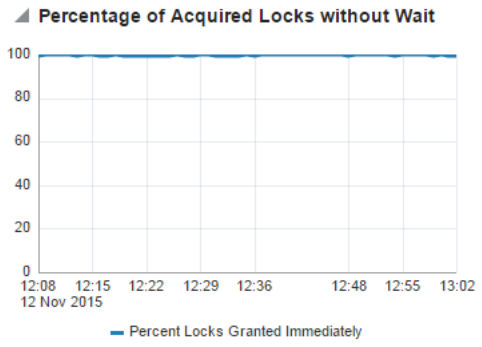
Figure 6–13 Lock Grants region



The lock grants region uses a line graph to show the lock grants after wait per minute. The rate of locks granted after wait should be low indicating that locks were acquired on time. Ideally, the rate should be 0.

Percentage of acquired locks without wait

Figure 6–14 Percentage of Acquired Locks without Wait region



The percent of acquired locks without wait uses a line graph to show the ratio of immediate grants per minute divided by the total rate of grants per minute. This percentage should be close to 100% indicating that locks are acquired without wait. This graph is a good measure of lock contention and concurrency in your TimesTen target.

Transaction Logs

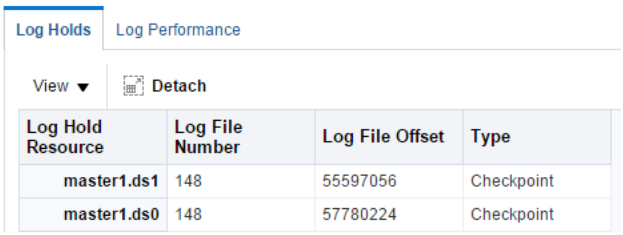
The transaction logs page displays information about log holds and the performance of log holds. The page is divided into two sub-tabs:

- Log holds
- Log performance

Log holds

The log holds sub-tab provides a report of the logs that are being held for the different operations that run on your TimesTen database target. Such operations include transactions, checkpoints, and replication.

Figure 6–15 Log Holds region



The log holds table contains the same columns and values as the `ttLogHolds` built-in procedure. For more information about `ttLogHolds`, see "ttLogHolds" in the *Oracle TimesTen In-Memory Database Reference*. Use the table to monitor how well the operations that depend on the log buffer are doing.

If logs start to accumulate in the log holds table, review the operations that are not allowing the transaction log fils to be purged.

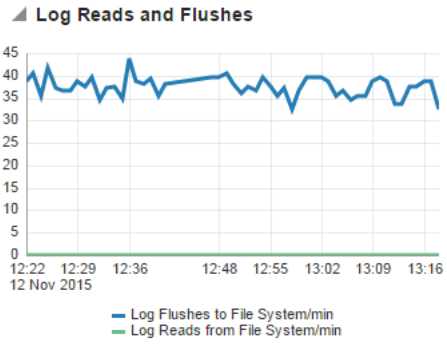
Log performance

The log performance page enables you to review the performance of the log buffer. The log performance sub-tab is divided into two regions:

- Log reads and log flushes
- Log buffer wait

Log reads and log flushes

Figure 6–16 Log Reads and Log Flushes region

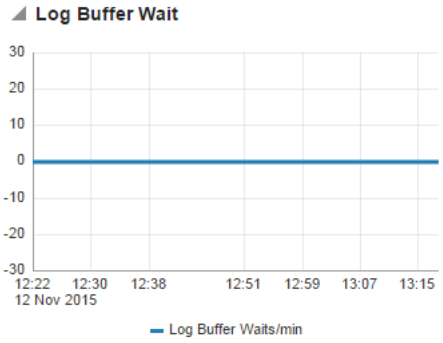


The log reads and log flushes region uses a line graph to show the log reads from the file system per minute and the log flushes to the file system per minute. Both the log reads and the log flushes should be low. A non zero rate of log reads from the file system results in poor response time. Ideally, all log records are read from memory (the log buffer) rather than from disk because reading log records from memory is significantly faster.

A high rate of log flushes to the file system may indicate either the need for a larger log buffer or that operations such as checkpoints, replication or XLA are not performing quickly, resulting in the log buffer being persisted to disk.

Log buffer wait

Figure 6–17 Log Buffer Wait region



The log buffer waits per minute region helps you review how the operations that use the log files are doing. The values should be 0. A nonzero value indicates that transactions needed to wait before writing to the log buffer.

Checkpoints

Figure 6–18 Checkpoints table

View ▾ Detach

Identifiers	Type	Initiator	Start Time	End Time	Dirty Blocks	Database file number	Checkpoint Volume(MB)	Rate (MB/sec)	Status
6412	Fuzzy	Checkpointer	Novemb…	Novem…	14	0	19.52	0.033	Completed
6413	Fuzzy	Checkpointer	Novemb…	Novem…	14	1	19.52	0.033	Completed
6414	Fuzzy	Checkpointer	Novemb…	Novem…	14	0	19.52	0.033	Completed
6415	Fuzzy	Checkpointer	Novemb…	Novem…	14	1	19.52	0.033	Completed
6416	Fuzzy	Checkpointer	Novemb…	Novem…	14	0	19.52	0.033	Completed
6417	Fuzzy	Checkpointer	Novemb…	Novem…	14	1	19.52	0.033	Completed
6418	Fuzzy	Checkpointer	Novemb…	Novem…	14	0	19.52	0.033	Completed
6419	Fuzzy	Checkpointer	Novemb…	Novem…	14	1	19.52	0.033	Completed
6420	Fuzzy	Checkpointer	Novemb…	Novem…	14	0	19.52	0.033	Completed

The checkpoints table shows the checkpoint history for the last 24 hours. Identifiers is a unique numeric identifier for the checkpoint. Identifiers increase monotonically during the lifetime of the database. If you destroy the database, the identifiers are reset. If you destroy the database, but keep the target in Enterprise Manager, you may see a mixture of checkpoints from the both the destroyed and the new database. The new database identifiers are likely to be small and are at the bottom of the table. If you want to see the new database identifiers at the top of the table, sort by Start Time.

Valid values for Type are static, blocking, fuzzy, or none. Valid values for initiator are user, checkpointer, or subdaemon. For the Dirty Blocks column, the values are the number of dirty blocks written. These are blocks that were modified since the last checkpoint. For the Rates column, the value is the volume written per second (in Megabytes). Valid values for the Status column is Progress, Completed, or Failed.

The TimesTen plug-in polls the TimesTen database target every 10 minutes and checks the latest eight checkpoints. If there are more than eight checkpoints in a 10 minute interval, only the last eight checkpoints are displayed. You can sort checkpoints by start time by clicking on the column header.

7

Working with the Transaction Monitor

This chapter describes the TimesTen transaction monitor page. The transaction monitor page displays a snapshot of the current transactions in your TimesTen database and describes details about your transactions.

Topics include:

- Viewing the transaction monitor page
- Analyzing information on the transaction monitor page

Viewing the transaction monitor page

Before using the transaction monitor, ensure that preferred credentials are set for your TimesTen database target. For more information about setting preferred credentials, see "Setting preferred credentials for a target" on page 1-36.

To view the transaction monitor page, ensure that you are on the TimesTen database target page. For information on navigating to the TimesTen database target page, see "Navigating to the TimesTen target page" on page 2-1.

From the **TimesTen Database Home** menu, select **Monitoring**, then select **Transaction Monitor**.

Analyzing information on the transaction monitor page

The transaction monitor displays a snapshot of the current transactions in your TimesTen database and describes details about your transactions. Use the transaction monitor to review how your transactions are processed. If your application is running slow, there may be an issue with how the transactions in the application are acquiring locks. If a lock is not released or is taking too long to be released, application responsiveness is degraded. The transaction monitor can help you identify transactions that are taking too long to be processed.

> **Note:** Enterprise Manager enables you to set the display frequency and auto refresh rate of data on the transaction monitor page. For more information, see "Setting the display time period and auto refresh rate of data on a target page" on page 2-5.

The transaction monitor page is divided into two tabs:

- Outstanding locks
- Awaiting locks

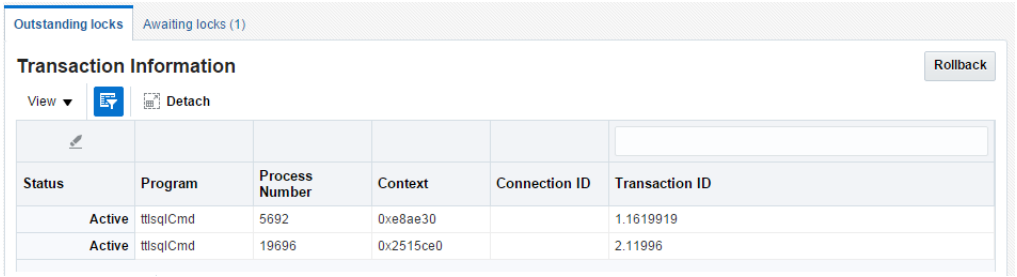
Outstanding locks

The outstanding locks tab enables you to view information about outstanding locks in your database. It is divided into two regions:

- Transaction information
- Lock detail for transaction

Transaction information

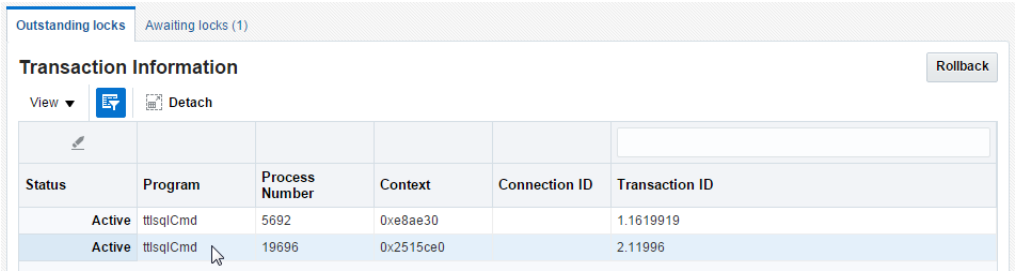
Figure 7–1 Transaction Information region



The transaction information region displays the current transactions that are holding locks in your database in a table format. You can click the column header to sort the table based on the column.

Click a transaction to review detailed information about the transaction and the locks associated with the transaction.

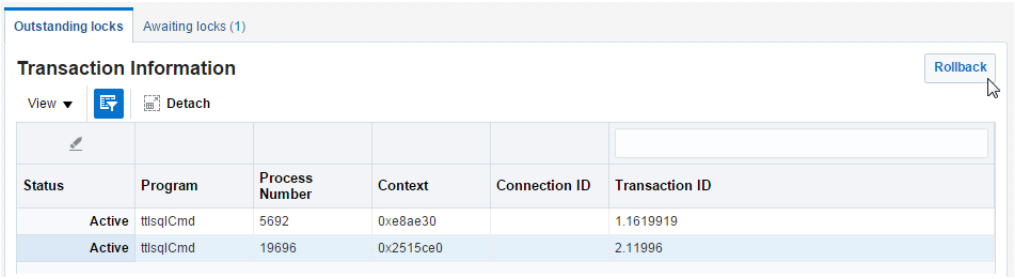
Figure 7–2 Select a transaction



The lock information for your selected transaction displays in the lock detail for transaction region. For more information on the lock detail for transaction region, see "Lock detail for transaction" on page 7-3.

To rollback a transaction, select the transaction and click the **Rollback** button that is located above the transaction information table.

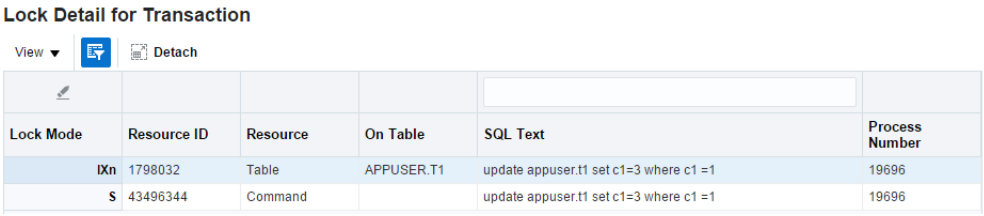
Figure 7–3 Rollback a transaction



A confirmation dialog appears where you need to confirm the rollback operation.

Lock detail for transaction

Figure 7–4 Lock details



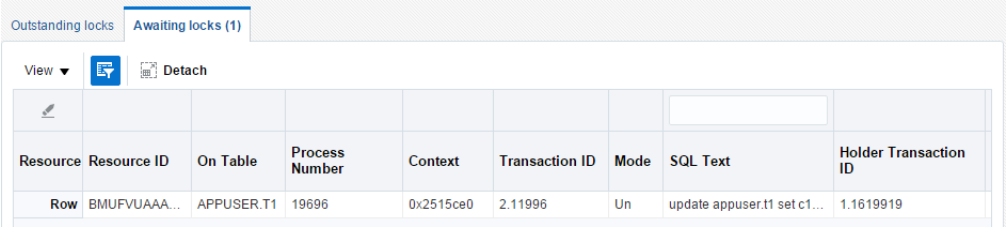
The lock details region displays information about the locks of a selected transaction.

The number of locks in the lock details region should be low. If you see many locks, review the way your application is acquiring locks.

For more information about locks and transactions, see "ttXactAdmin" in the *Oracle TimesTen In-Memory Database Reference.*

Awaiting locks

Figure 7–5 Awaiting locks



The awaiting locks region displays transactions that are competing for the same lock resources.

The number of locks in the awaiting locks region should be low. Locks that are awaiting events such as user input do not show in the table. If you see a transaction that does not clear after running the transaction monitor multiple times, review the lock. You may need to force a commit or a rollback on the transaction.

For more information about locks and transactions, see "ttXactAdmin" in the *Oracle TimesTen In-Memory Database Reference.*

8

Working with the Client/Server Page

This chapter describes the TimesTen database client/server page. The TimesTen database client/server page conveys performance information about your TimesTen client/server connection.

Topics include:

- Viewing the client/server page
- Analyzing information on the TimesTen client/server page

Viewing the client/server page

To view the client/server summary page, ensure that you are on the TimesTen database target page. For information on navigating to the TimesTen database target page, see "Navigating to the TimesTen target page" on page 2-1.

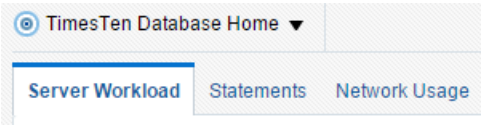
From the **TimesTen Database Home** menu, select **Monitoring**, then select **Client/Server Summary**.

The TimesTen database client/server summary page displays.

Analyzing information on the TimesTen client/server page

Figure 8–1 shows the three client/server specific tab that have been customized for your TimesTen database targets. Click a specific tab to view detailed client/server information.

Figure 8–1 Client/Server Summary tabs



A description of each area follows:

- Server Workload
- Statements
- Network usage

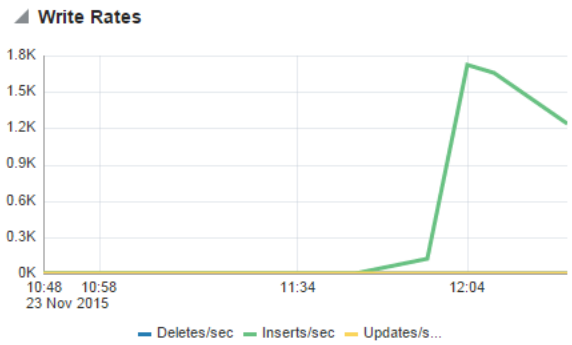
Server Workload

The server workload tab enables you to view information about server workload. The server workload tab contains three graph regions:

- Write rates
- Read rates
- Commits and rollbacks

Write rates

Figure 8–2 Write Rates region



The write rates region uses a line graph to show the rate of `INSERT`, `UPDATE`, and `DELETE` operations executed on rows per second on the TimesTen server.

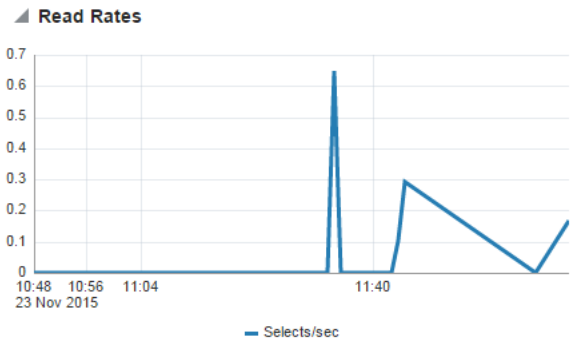
The write rates region is populated when the TimesTen database is enabled to collect all database and operating system statistics. To enable TimesTen to collect all database and operating system statistics, call the `ttStatsConfig` built-in procedure with the `StatsLevel` parameter set to `ALL`.

```
Command> call ttStatsConfig('StatsLevel','ALL');
< STATSLEVEL, ALL >
1 row found.
```

For more information about the `ttStatsConfig` built-in procedure, see "ttStatsConfig" in the *Oracle TimesTen In-Memory Database Reference*.

Read rates

Figure 8–3 Read Rates region



The read rates region uses a line graph to show the rate of `SELECT` operations executed on rows per second on the TimesTen server.

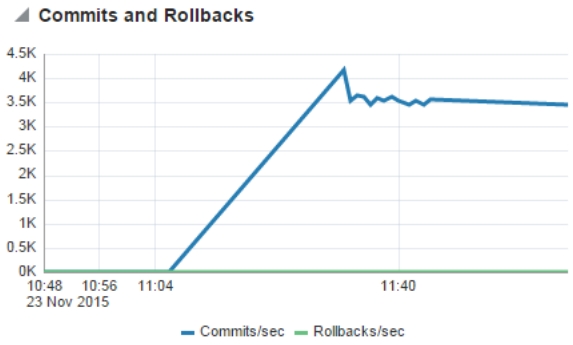
The read rates region is populated when the TimesTen database is enabled to collect all database and operating system statistics. To enable TimesTen to collect all database and operating system statistics, execute the `ttStatsConfig` built-in procedure with the `StatsLevel` parameter set to `ALL`.

```
Command> call ttStatsConfig('StatsLevel','ALL');
< STATSLEVEL, ALL >
1 row found.
```

For more information about the `ttStatsConfig` built-in procedure, see "ttStatsConfig" in the *Oracle TimesTen In-Memory Database Reference*.

Commits and rollbacks

Figure 8–4 Commits and Rollbacks region



The commits and rollbacks region uses a line graph to show the rate of `COMMIT` and `ROLLBACK` statements executed per second on the TimesTen server.

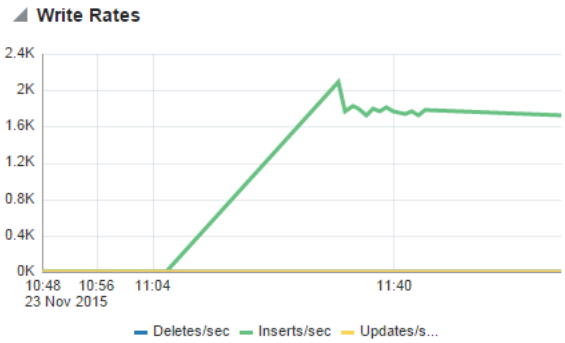
Statements

The statements tab enables you to view information about the read and write rates of your SQL statements. The statements tab contains two graph regions:

- Write rates
- Read rates

Write rates

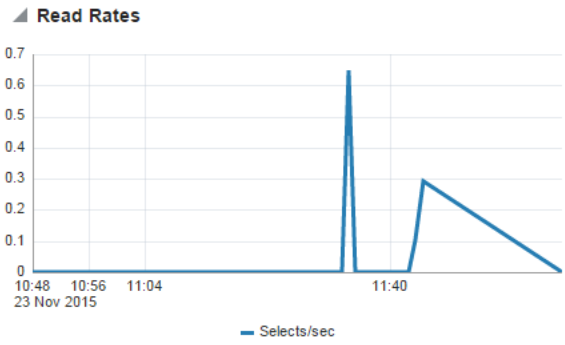
Figure 8–5 Write Rates region



The write rates region uses a line graph to show the rate of `INSERT`, `UPDATE`, and `DELETE` operations executed per second on the TimesTen server.

Read rates

Figure 8–6 Read Rates region



The read rates region uses a line graph to show the rate of `SELECT` operations executed per second on the TimesTen server.

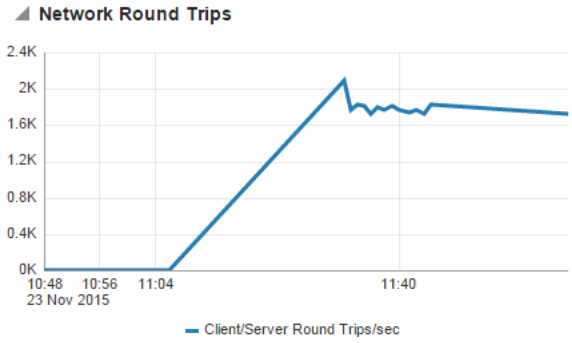
Network usage

The network usage tab enables you to view information about client/server network usage. The network usage tab contains two graph regions:

- Network round trips
- Bytes sent and received

Network round trips

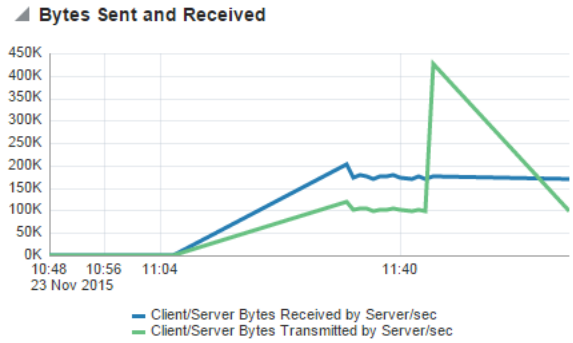
Figure 8–7 Network Round Trips region



The network round trips region uses a line graph to show the client/server round trips per second.

Bytes sent and received

Figure 8–8 Bytes Sent and Received region



The bytes sent and received region uses a line graph to show the number of bytes sent and received by the TimesTen server per second.

9

Working with the Instance Control Menu

This chapter describes the TimesTen instance control menu. The instance control menu displays options to control various aspects of your TimesTen instance targets.

Topics include:

- Viewing the instance control menu

Viewing the instance control menu

To view the instance control menu, ensure that you are on the TimesTen instance target page. For information on navigating to the TimesTen instance target page, see "Navigating to the TimesTen target page" on page 2-1.

From the **TimesTen Instance Home** menu, select **Control**.

The TimesTen instance control menu displays. Click a specific option to view TimesTen instance controls. A description of each option follows:

- Start/stop services
- Create blackout
- End blackout/brownout

Start/stop services

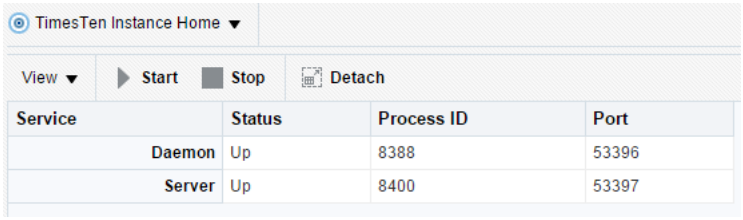
The start/stop services page enables you to start and stop the TimesTen daemon and TimesTen server services. This page also displays statistics of TimesTen databases that are part of your current TimesTen instance. The start/stop services page contains two regions:

> **Note:** In order to start and stop the TimesTen daemon of a TimesTen instance, you must set preferred credentials for your TimesTen instance target. For more information, see "Setting preferred credentials for a target" on page 1-36.

- Service
- Database

Service

Figure 9–1 Service region



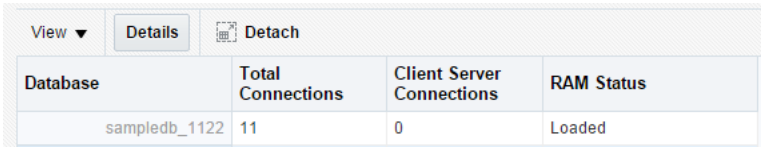
The service region enables you to start and stop the TimesTen daemon and TimesTen server services. You can select a row and then click Start or Stop to control the TimesTen services. If you stop the TimesTen daemon and a TimesTen database is loaded into memory, Enterprise manager displays a dialog that recommends that you close all connections to your TimesTen database and unload the database from memory. This dialog enables you to filter the Database region to only view the TimesTen databases with active connections and that are loaded into memory.

The services region enables you to perform similar control operations as the `ttDaemonAdmin` utility. The Status, Process ID, and Port columns are populated with information from the `ttStatus` utility. For more information about the utilities, see "ttDaemonAdmin" and "ttStatus" in the *Oracle TimesTen In-Memory Database Reference*.

The port column of the Service table shows you the ports on which the TimesTen daemon and TimesTen server listen. If these ports conflict with another application, consider changing the TimesTen ports with the `ttInstanceModify` utility. For more information on the `ttInstanceModify` utility, see "ttInstanceModify" in the *Oracle TimesTen In-Memory Database Reference*.

Database

Figure 9–2 Database region



The database region displays statistics of TimesTen databases that are part of your current TimesTen instance. The database table is populated with information from the `ttStatus` utility. You can select a row in the table and then click the Details button to view all the connections to the selected TimesTen database. For more information about the `ttStatus` utility, see "ttStatus" in the *Oracle TimesTen In-Memory Database Reference*.

Create blackout

Create a blackout to suspend all data collection activity on a target that is monitored by Enterprise Manager. Consider creating a blackout to perform maintenance on a TimesTen instance target. For more information on creating a blackout, see "Creating a Blackout" in the *Oracle Enterprise Manager Cloud Control Administrator's Guide*.

Create brownout

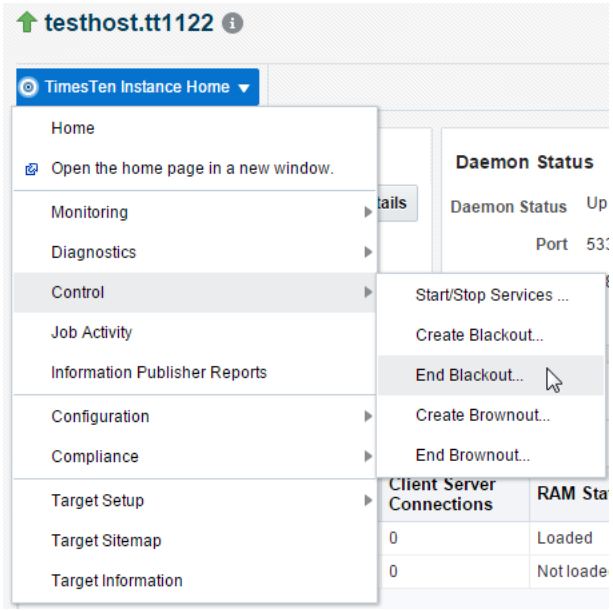
Create a brownout to suppress the notifications on a target that is monitored by Enterprise Manager. The Agent continues to monitor the target under brownout and the OMS will show the actual target status along with an indication that the target is currently under brownout. Events will be generated as usual during a brownout. Only the event notifications are suppressed.

End blackout/brownout

Blackouts and brownouts end automatically after the set duration expires. In some cases you may want to end a blackout or brownout before the blackout duration expires. To end a blackout or brownout, ensure that you are on the TimesTen instance target page and that a blackout is active for your TimesTen instance target. For information on navigating to the TimesTen instance target page, see "Navigating to the TimesTen target page" on page 2-1.

1. From the **TimesTen Instance Home** menu, select **Control**, then select **End Blackout** or **End Brownout**.

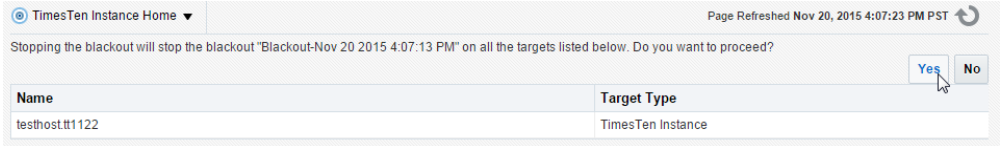
Figure 9–3 Select End Blackout or End Brownout



The Blackouts confirmation page displays. Locate the Yes button.

2. Click **Yes**.

Figure 9–4 Click Yes



The information dialog displays with text saying that the blackout or brownout successfully ended.

You have successfully ended the blackout or brownout of your TimesTen instance target. Enterprise Manager can take several minutes to resume data collection activities on your TimesTen instance target.

10

Working with the Database Control Menu

This chapter describes the TimesTen database control menu. The database control menu displays options to control various aspects of your TimesTen database targets.

Topics include:

- Viewing the database control menu

Viewing the database control menu

To view the database control menu, ensure that you are on the TimesTen database target page. For information on navigating to the TimesTen database target page, see "Navigating to the TimesTen target page" on page 2-1.

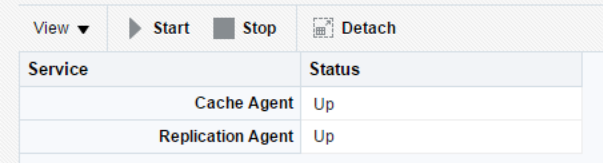
From the **TimesTen Database Home** menu, select **Control**.

The TimesTen database control menu displays. Click a specific option to view TimesTen database controls. A description of each option follows:

- Start/stop agents
- Ram load/unload and policy settings
- Create blackout
- End blackout/brownout

Start/stop agents

Figure 10–1 Start/Stop Agents page



The start/stop agents page enables you to start and stop the TimesTen replication and TimesTen cache agents. You can select a row and then click Start or Stop to control the TimesTen agents.

The start/stop agents page calls these built-in procedures to control the TimesTen agents:

- `ttCacheStart` - This built-in procedure starts the TimesTen cache agent. For more information, see "ttCacheStart" in the *Oracle TimesTen In-Memory Database Reference*.

- `ttCacheStop` - This built-in procedure stops the TimesTen cache agent. For more information, see "ttCacheStop" in the *Oracle TimesTen In-Memory Database Reference*.
- `ttRepStart` - This built-in procedure starts the TimesTen replication agent. For more information, see "ttRepStart" in the *Oracle TimesTen In-Memory Database Reference*.
- `ttRepStop` - This built-in procedure stops the TimesTen replication agent. For more information, see "ttRepStop" in the *Oracle TimesTen In-Memory Database Reference*.

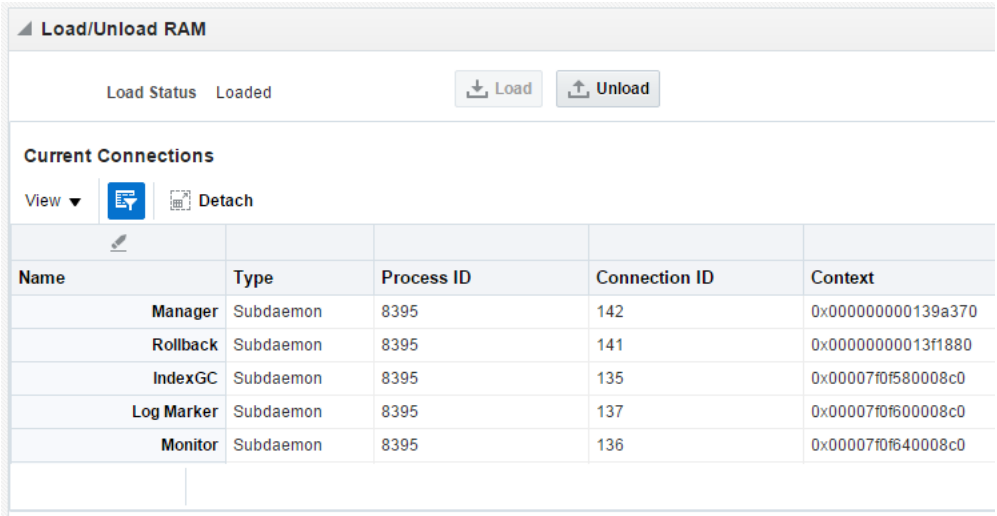
Ram load/unload and policy settings

The Ram load/unload and policy settings page enables you to load and unload the TimesTen database from memory and change the RAM policy of the TimesTen database. This page contains two regions:

- Load/unload RAM
- RAM policy configuration

Load/unload RAM

Figure 10–2 Load/Unload RAM region



The load/unload RAM region enables you to load and unload the TimesTen database from memory. You can also review the load status of the TimesTen database and current connections to your TimesTen database. The load and unload options are only available if your database RAM residence policy is set to Manual. You can click the Load button to load the database into memory. You can click the Unload button to unload the database from memory. Before unloading the TimesTen database from memory, ensure that all applications are disconnected from your TimesTen database. Also, ensure that you stop the cache and replication agents. For more information on stopping the cache and replication agents, see "Start/stop agents" on page 10-1.

The load/unload RAM region runs the `ttAdmin` utility to load and unload the database from memory. For more information, see "ttAdmin" in the *Oracle TimesTen In-Memory Database Reference*.

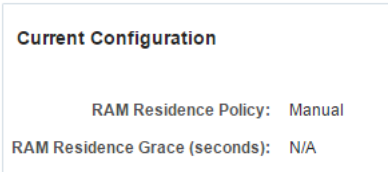
RAM policy configuration

The RAM policy configuration region enables you to view your current RAM residence policy and change the RAM policy of your TimesTen database. The RAM policy configuration contains two sub-regions:

- Current configuration
- Change RAM policy

Current configuration

Figure 10–3 Current Configuration sub-region

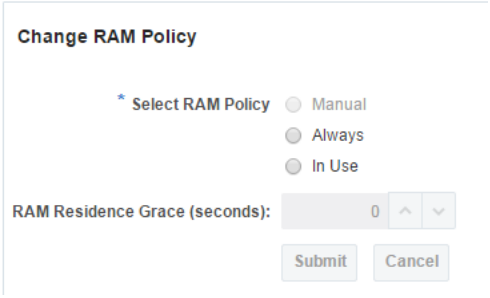


The current configuration sub-region displays the current RAM residence policy and the RAM residence grace period.

The current configuration sub-region runs the `ttAdmin` utility to display the current RAM configuration of your database. For more information, see "ttAdmin" in the *Oracle TimesTen In-Memory Database Reference*.

Change RAM policy

Figure 10–4 Change RAM policy sub-region



The change RAM policy sub-region enables you to modify the RAM policy of your TimesTen database. If you set the RAM policy as In Use, you can also set a RAM residence grace period.

The change RAM policy sub-region runs the `ttAdmin` utility to change the RAM policy and set RAM residence grace period. For more information on the `ttAdmin` utility and the RAM policy settings, see "ttAdmin" in the *Oracle TimesTen In-Memory Database Reference*.

Create blackout

Create a blackout to suspend all data collection activity on a target that is monitored by Enterprise Manager. Consider creating a blackout to perform maintenance on a TimesTen instance target. For more information on creating a blackout, see "Creating a Blackout" in the *Oracle Enterprise Manager Cloud Control Administrator's Guide*.

Create brownout

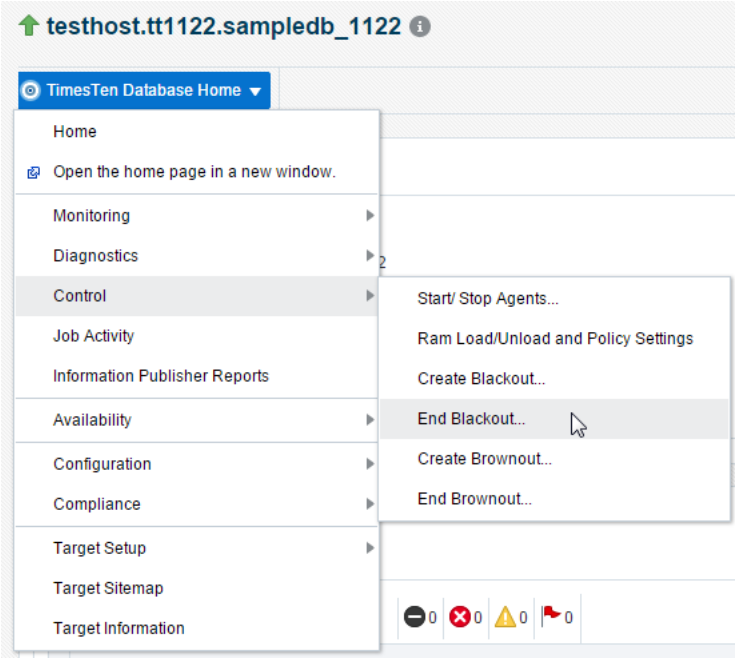
Create a brownout to suppress the notifications on a target that is monitored by Enterprise Manager. The Agent continues to monitor the target under brownout and the OMS will show the actual target status along with an indication that the target is currently under brownout. Events will be generated as usual during a brownout. Only the event notifications are suppressed.

End blackout/brownout

Blackouts and brownouts end automatically after the set duration expires. In some cases you may want to end a blackout or brownout before the blackout duration expires. To end a blackout or brownout, ensure that you are on the TimesTen database target page and that a blackout is active for your TimesTen database target. For information on navigating to the TimesTen database target page, see "Navigating to the TimesTen target page" on page 2-1.

1. From the **TimesTen Database Home** menu, select **Control**, then select **End Blackout** or **End Brownout**.

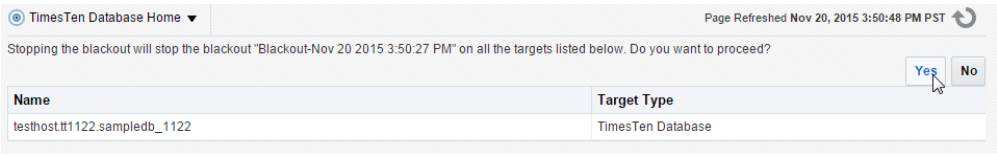
Figure 10–5 Select End Blackout



The Blackouts confirmation page displays. Locate the Yes button.

2. Click **Yes**.

Figure 10–6 Click Yes



The information dialog displays with text saying that the blackout or brownout successfully ended.

You have successfully ended the blackout or brownout of your TimesTen database target. Enterprise Manager can take several minutes to resume data collection activities on your TimesTen database target.

11

Working with the Backup and Restore Page

This chapter describes the TimesTen database Backup and Restore page. The TimesTen database backup and restore page enables you to schedule database backups, restore from available backups, and view recovery history.

Topics include:

- Viewing the backup and restore page
- Analyzing information on the TimesTen backup and restore page

Viewing the backup and restore page

Before using database backup and restore, ensure that preferred credentials are set for your TimesTen database target. For more information about setting preferred credentials, see "Setting preferred credentials for a target" on page 1-36.

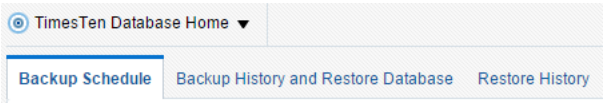
To view the backup and restore page, ensure that you are on the TimesTen database target page. For information on navigating to the TimesTen database target page, see "Navigating to the TimesTen target page" on page 2-1.

From the **TimesTen Database Home** menu, select **Availability**, then select **Backup and Restore**.

Analyzing information on the TimesTen backup and restore page

Figure 11–1 shows the three backup and restore specific areas that have been customized for your TimesTen database targets. Click a specific tab to view detailed information.

Figure 11–1 Backup and Restore tabs

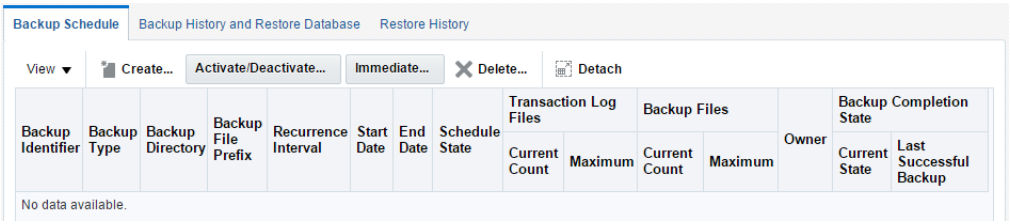


A description of each area follows:

- Backup schedule
- Backup history and restore database
- Restore history

Backup schedule

Figure 11–2 Backup Schedule tab



The backup schedule tab enables you to create, edit, and delete backup schedules for your TimesTen database. TimesTen calls the `ttBackup` utility to perform backups of your TimesTen database. For more information on the `ttBackup` utility, see "ttBackup" in the *Oracle TimesTen In-Memory Database Reference*.

You can perform these actions on the backup schedule tab:

- Create a backup schedule
- Activate a backup schedule
- Deactivate a backup schedule
- Request an immediate backup
- Delete a backup schedule

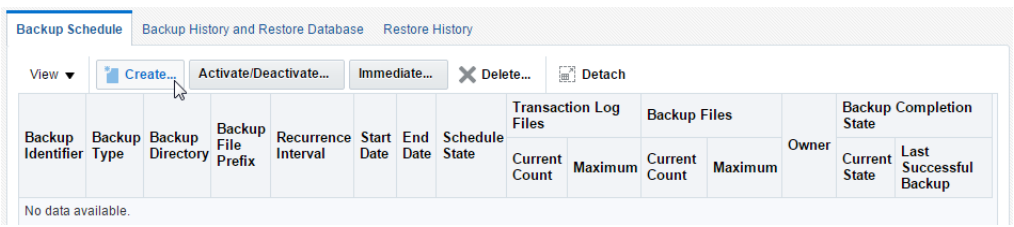
Create a backup schedule

To create a backup schedule, ensure that you are on the Backup Schedule tab of the Backup and Restore page.

> **Note:** The backup and restore functions for the TimesTen database in Enterprise Manager cannot backup and restore TimesTen databases with cache groups. For more information on backing up and restoring TimesTen databases with cache groups, see "Backing up and restoring a database with cache groups" in the *Oracle TimesTen Application-Tier Database Cache User's Guide*.

1. Click **Create**.

Figure 11–3 Click Create



The Create a Backup Schedule dialog displays. The first property is the Type of Backup.

2. Select a backup type from the **Type** options. These are the available backup types:

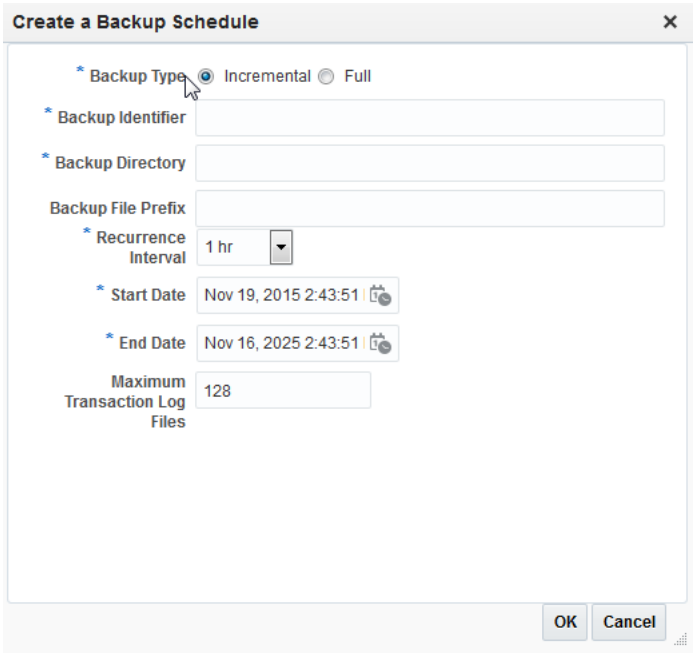
- Incremental

  An incremental backup augments an existing incremental-enabled backup of the same database. An incremental backup moves the backup point of an existing backup forward in time by augmenting the backup with all of the transaction log files created since its last backup point.

- Full

  A full backup saves the entire database. For full backups, you must have enough disk space available to hold both the existing backup and the new backup, until the new backup succeeds.

Figure 11–4 Select a backup type



You are now ready to define your new backup schedule.

Incremental

An incremental backup augments an existing incremental-enabled backup of the same database. An incremental backup moves the backup point of an existing backup forward in time by augmenting the backup with all of the transaction log files created since its last backup point.

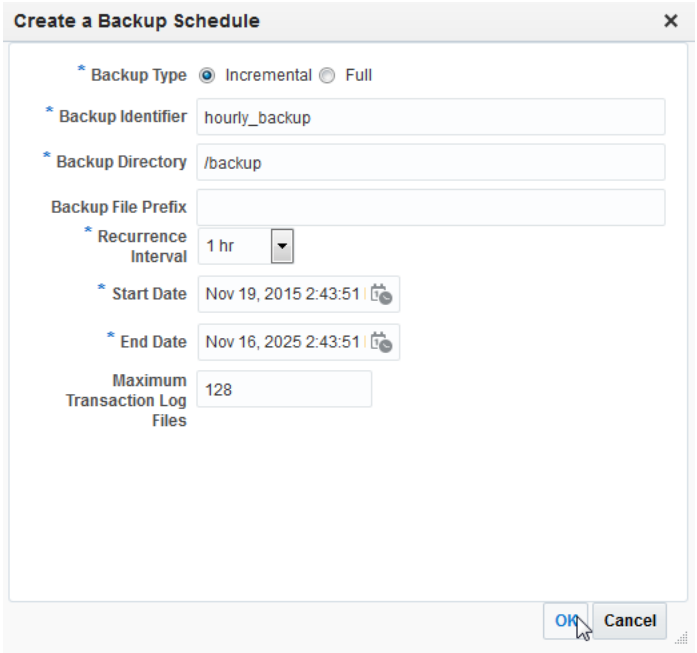
An incremental backup typically completes much faster than a full backup, as it has less data to copy. The performance gain of incremental backups over full backups comes at the cost of increased disk usage and longer restoration times. Use incremental backups in concert with full backups to achieve a balance between backup time, disk usage, and restoration time.

Before defining a backup schedule, ensure that you have completed the steps up to step 2 from "Create a backup schedule" on page 11-2.

Note: For more information about TimesTen backup types, see "Types of backups" in the *Oracle TimesTen In-Memory Database Installation, Migration, and Upgrade Guide*.

1. In the * **Backup Identifier** text field, type a meaningful backup schedule name. (For example, *hourly_backup*.)
2. In the * **Backup Directory** text field, type the directory where the backup files should be stored. Ensure that this directory exists.
3. In the **Backup File Prefix** text field, type a file prefix for the backup files in the backup directory. The Backup File Prefix field is optional. The default value for this option is the file name portion of the `DataStore` attribute of the database's ODBC definition. For more information about the `DataStore` attribute, see "DataStore" in the *Oracle TimesTen In-Memory Database Reference*.
4. From the * **Recurrence Interval** drop-down list, select a recurrence for when TimesTen checks the maximum transaction log files criteria. If the maximum transaction log files criteria is met, TimesTen performs an incremental backup. The default value is 1 hour.
5. Click the calendar button to the right of the * **Start Date** field, then select the start date and time for the backup schedule. The default value is the current date and time of the Enterprise Manager server.
6. Click the calendar button to the right of the * **End Date** field, then select the end date for the backup schedule. The default value is 10 years after the current date of the Enterprise Manager server.
7. In the **Maximum Transaction Log Files** text field, type the number of transaction log files when an incremental backup is performed. TimesTen only performs the incremental backup if the maximum transaction log files criteria is met during a recurrence check. The default value is 128.
8. Click **OK**.

Figure 11–5 Click OK



The Create a Backup Schedule dialog closes and you are returned back to the Backup Schedule tab of the Backup and Restore page. Notice the backup schedule you created is auto-filled in the backup schedule table.

If you see a "No preferred credentials set" error message, set preferred credentials for your TimesTen database target and activate the backup schedule you created. Ensure that your backup schedule works by requesting an immediate backup. For more information, see "Setting preferred credentials for a target" on page 1-36, "Activate a backup schedule" on page 11-6, and "Request an immediate backup" on page 11-9.

You successfully created a TimesTen incremental backup schedule.

Full

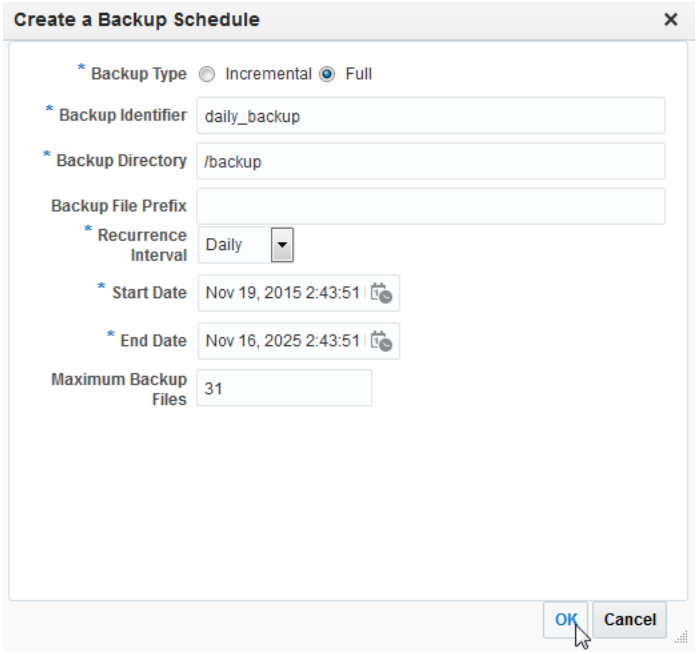
A full backup saves the entire database. For full backups, you must have enough disk space available to hold both the existing backup and the new backup, until the new backup succeeds.

Note: For more information about TimesTen backup types, see "Types of backups" in the *Oracle TimesTen In-Memory Database Installation, Migration, and Upgrade Guide*.

---

1. In the * **Backup Identifier** text field, type a meaningful backup schedule name. (For example, *daily_backup*.)
2. In the * **Backup Directory** text field, type the directory where the backup files should be stored. Ensure that this directory exists.
3. In the **Backup File Prefix** text field, type a file prefix for the backup files in the backup directory. The Backup File Prefix field is optional. The default value for this option is the file name portion of the `DataStore` attribute of the database's ODBC definition. For more information about the `DataStore` attribute, see "DataStore" in the *Oracle TimesTen In-Memory Database Reference*.
4. From the * **Recurrence Interval** drop-down list, select a recurrence for when TimesTen checks the maximum transaction log files criteria. If the maximum transaction log files criteria is met, TimesTen performs an incremental backup.
5. Click the calendar button to the right of the * **Start Date** field, then select the start date and time for the backup schedule. The default value is the current date and time of the Enterprise Manager server.
6. Click the calendar button to the right of the * **End Date** field, then select the end date for the backup schedule. The default value is 10 years after the current date of the Enterprise Manager server.
7. In the **Maximum Backup Files** text field, type the maximum number of full backup files that TimesTen can store at any given time. When the maximum backup files value is exceeded, TimesTen deletes the oldest backup file before creating a new backup file. The default value is 31.
8. Click **OK**.

Figure 11–6 Click OK



The Create a Backup Schedule dialog closes and you are returned back to the Backup Schedule tab of the Backup and Restore page. Notice the backup schedule you created is auto-filled in the backup schedule table.

If you see a "No preferred credentials set" error message, set preferred credentials for your TimesTen database target and activate the backup schedule you created. Ensure that your backup schedule works by requesting an immediate backup. For more information, see "Setting preferred credentials for a target" on page 1-36, "Activate a backup schedule" on page 11-6, and "Request an immediate backup" on page 11-9.

You successfully created a TimesTen full backup schedule.

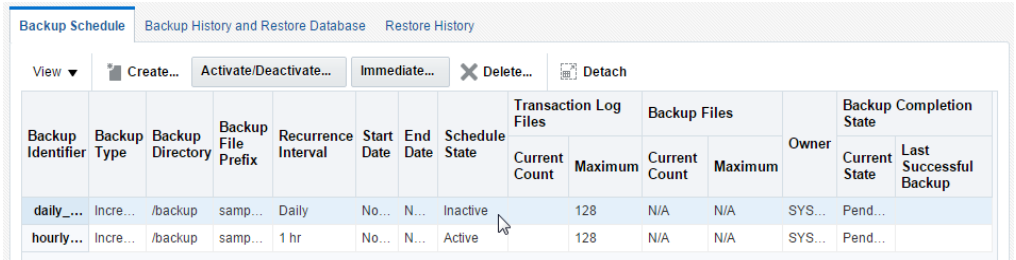
Activate a backup schedule

When you create a backup schedule Enterprise Manager activates the backup schedule. An active backup schedule runs based on its configured schedule.

To activate a backup schedule, ensure that you are on the Backup Schedule tab of the Backup and Restore page:

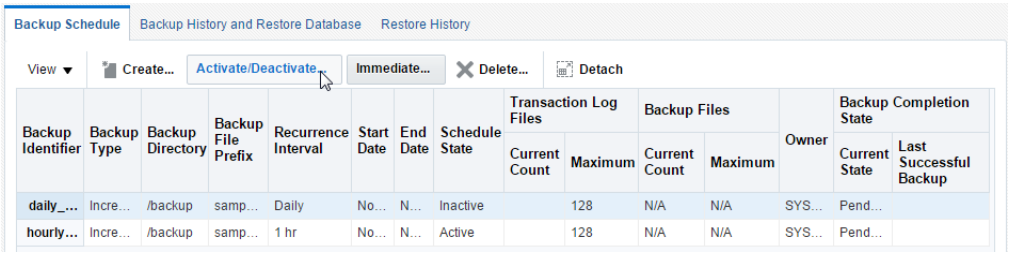
1. In the Backup Schedule table, click in the row that identifies the **Backup Identifier** of your backup schedule. Ensure that the Schedule State is Inactive.

Figure 11–7 Select your backup schedule



2. Click **Activate/Deactivate**.

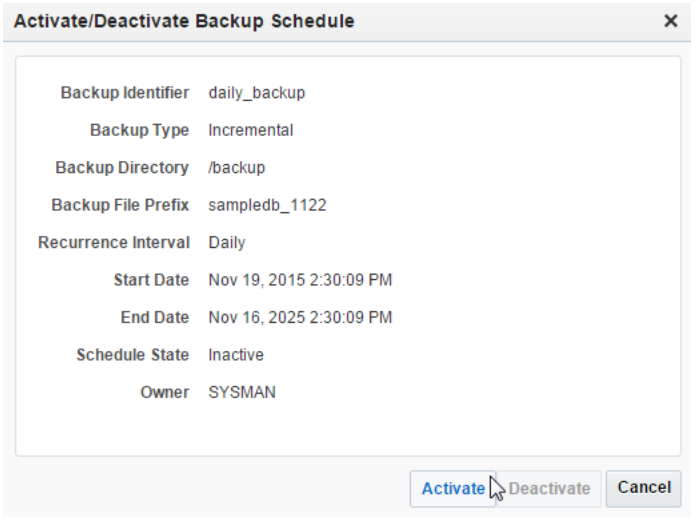
Figure 11–8 Click Activate/Deactivate



The Activate/Deactivate Backup Schedule dialog displays. Locate the Activate button.

3. Click **Activate**.

Figure 11–9 Click Activate



The Activate/Deactivate Backup Schedule dialog closes and the Backup Schedule tab of the Backup and Restore page refreshes. Notice that the Schedule State of your Backup Identifier is now Active.

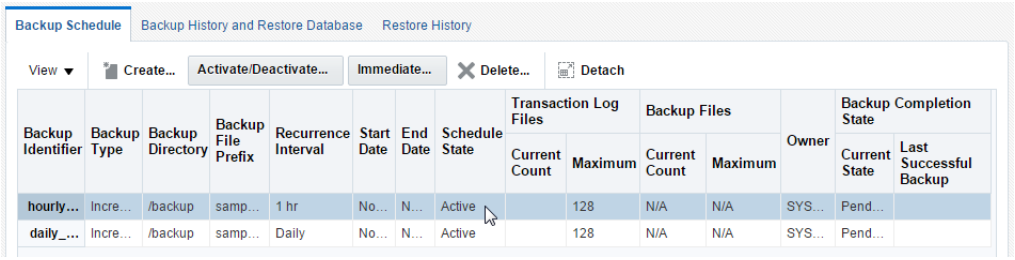
You have successfully activated your backup schedule.

Deactivate a backup schedule

To deactivate a backup schedule, ensure that you are on the Backup Schedule tab of the Backup and Restore page:

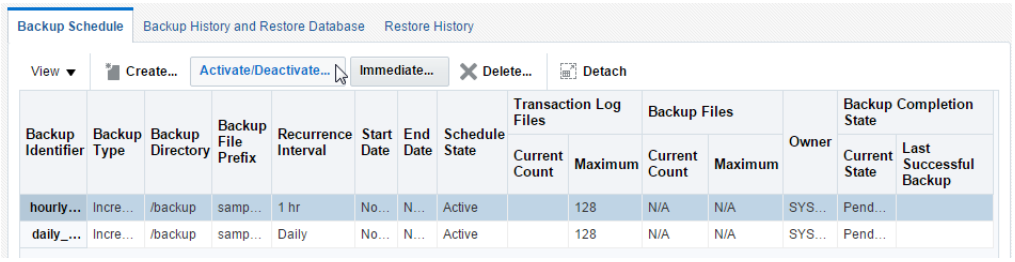
1. In the Backup Schedule table, click in the row that identifies the **Backup Identifier** of your backup schedule. Ensure that the Schedule State is Active.

Figure 11–10 Select your backup schedule



2. Click **Activate/Deactivate**.

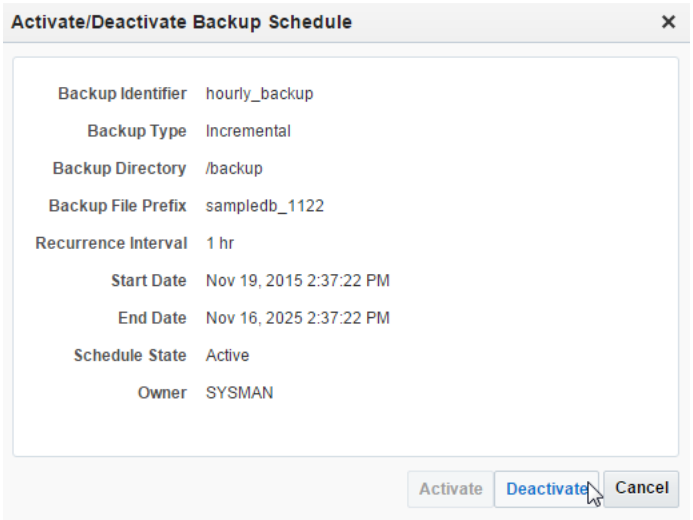
Figure 11–11 Click Activate/Deactivate



The Activate/Deactivate Backup Schedule dialog displays. Locate the Deactivate button.

3. Click **Deactivate**.

Figure 11–12 Click Deactivate



The Activate/Deactivate Backup Schedule dialog closes and the Backup Schedule tab of the Backup and Restore page refreshes. Notice that the Schedule State of your Backup Identifier is now Inactive.

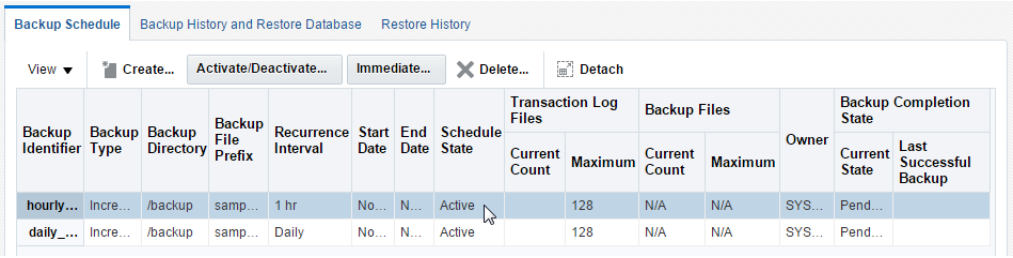
You have successfully deactivated your backup schedule.

Request an immediate backup

To request an immediate backup, ensure that you are on the Backup Schedule tab of the Backup and Restore page:

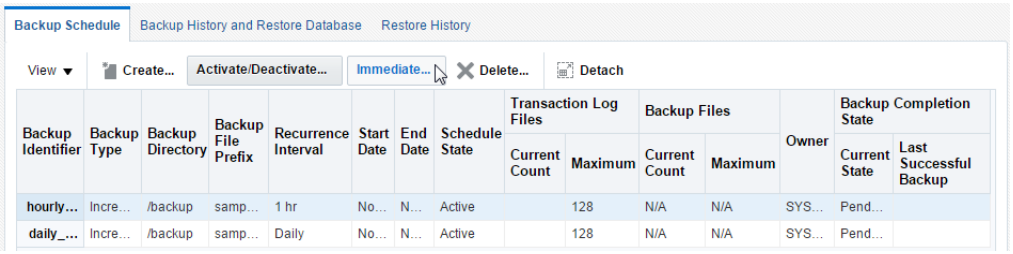
1. In the Backup Schedule table, click in the row that identifies the **Backup Identifier** of your backup schedule. Ensure that the Schedule State is Active.

Figure 11–13 Select your backup schedule



2. Click **Immediate**.

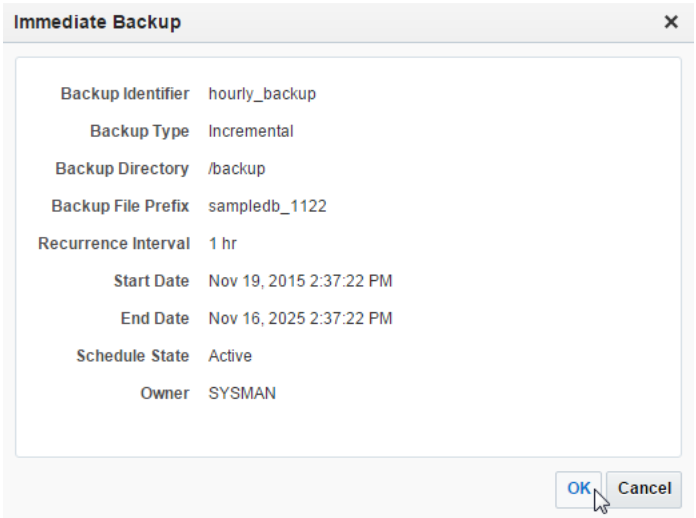
Figure 11–14 Click Immediate



The Immediate Backup dialog displays. Locate the OK button.

3. Click **OK**.

Figure 11–15 Click OK



The Immediate Backup dialog closes. TimesTen runs the `ttBackup` utility to complete your backup request. The backup time varies depending on the size of

your database. Review the Backup History tab to see the status of your TimesTen backup. For more information on the Backup History tab, see "Backup history and restore database" on page 11-11. For more information on the `ttBackup` utility, see "ttBackup" in the *Oracle TimesTen In-Memory Database Reference*.

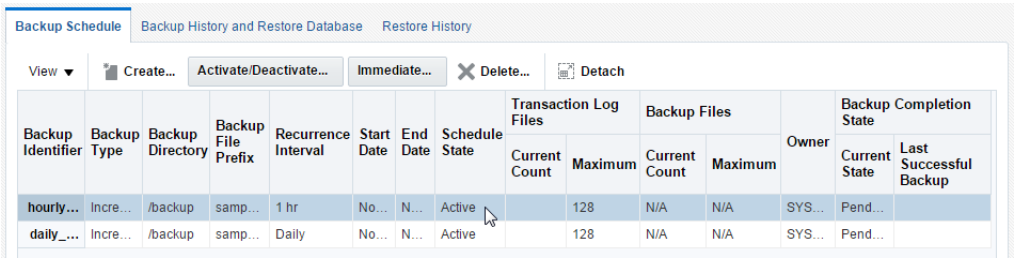
You have successfully requested an immediate TimesTen backup.

Delete a backup schedule

To delete a backup schedule, ensure that you are on the Backup Schedule tab of the Backup and Restore page:

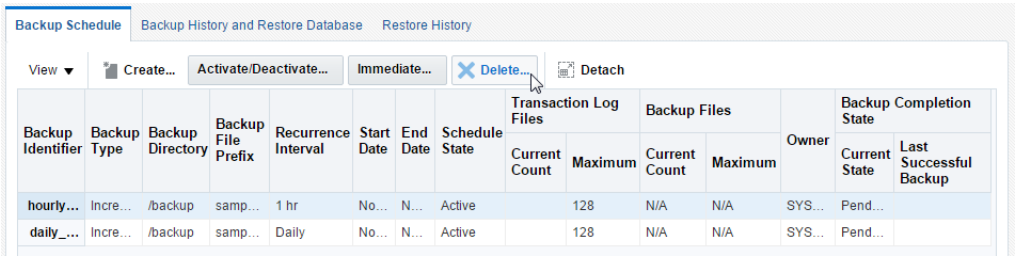
1. In the Backup Schedule table, click in the row that identifies the **Backup Identifier** of your backup schedule.

Figure 11–16 Select your backup schedule



2. Click **Delete**.

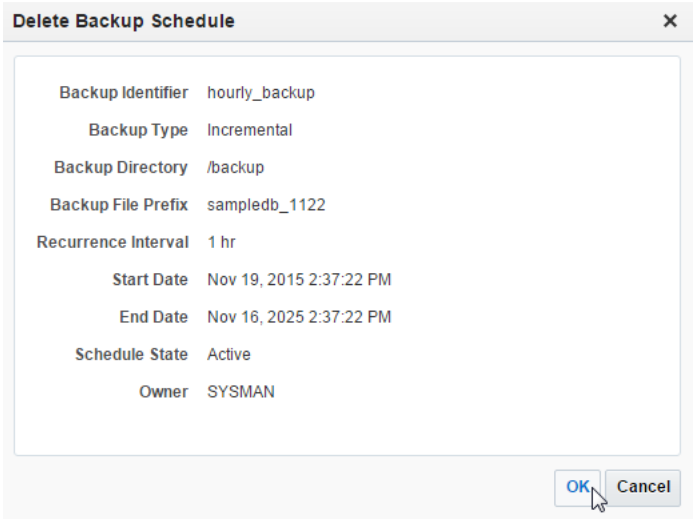
Figure 11–17 Click Delete



The Delete Backup Schedule dialog displays. Locate the OK button.

3. Click **OK**.

Figure 11–18 Click OK

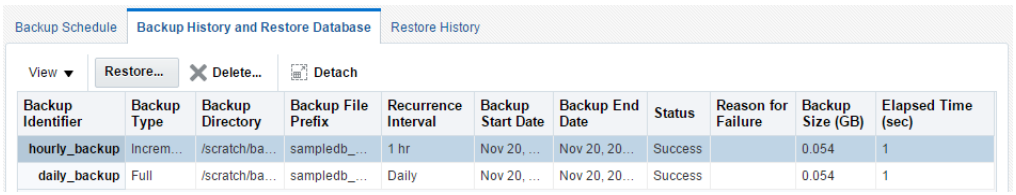


The Delete Backup Schedule dialog closes and the Backup Schedule tab of the Backup and Restore page refreshes. You can verify the backup schedule has been deleted by reviewing the Backup Schedule tab of the Backup and Restore page. You should no longer see your TimesTen backup schedule.

You have successfully deleted your TimesTen backup schedule.

Backup history and restore database

Figure 11–19 Backup History tab



The backup history tab and restore database enables you to view backup history, delete backups, and recover your TimesTen database. TimesTen calls the `ttRestore` utility to restore your TimesTen database from a backup. For more information on the `ttRestore` utility, see "ttRestore" in the *Oracle TimesTen In-Memory Database Reference*.

You can perform these actions on the backup history tab:

- Restore the TimesTen database with an available backup
- Delete a TimesTen database backup file

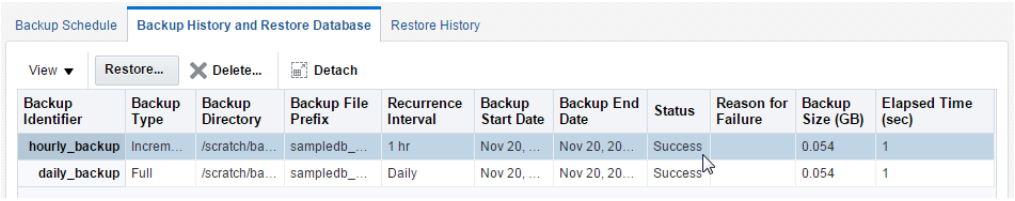
Restore the TimesTen database with an available backup

To restore your TimesTen database with an available backup, ensure that you are on the Backup History and Restore Database tab of the Backup and Restore page and that your TimesTen database is unloaded from memory. For more information on unloading your TimesTen database from memory, see "Load/unload RAM" on page 10-2.

Note: During the restoration procedure, Enterprise Manager does not collect any TimesTen database metric information. Enterprise Manager starts collecting TimesTen database metric information when the TimesTen database is restored.

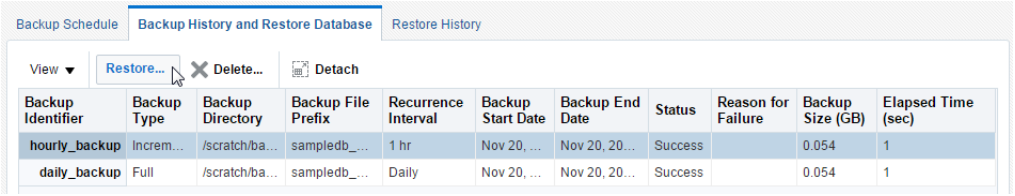
1. In the Backup History and Restore Database table, click in the row that identifies the **Backup Identifier** of your backup. Ensure that the Status is Success.

Figure 11–20 Select your backup



2. Click **Restore**.

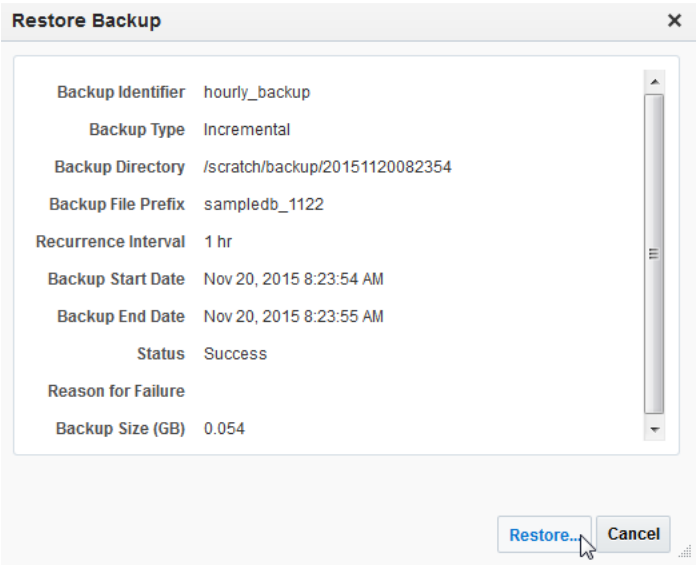
Figure 11–21 Click Restore



The Restore Backup dialog displays. Locate the OK button.

3. Click **Restore**.

Figure 11–22 Click Restore



The Restore Backup dialog closes. TimesTen runs the `ttRestore` utility to complete your TimesTen database restoration request. The restore time varies depending on

the size of your database. Review the Restore History tab to see the status of your TimesTen database restoration. For more information on the Restore History tab, see "Restore history" on page 11-14. For more information on the `ttRestore` utility, see "ttRestore" in the *Oracle TimesTen In-Memory Database Reference*

You have successfully requested a TimesTen database restoration.

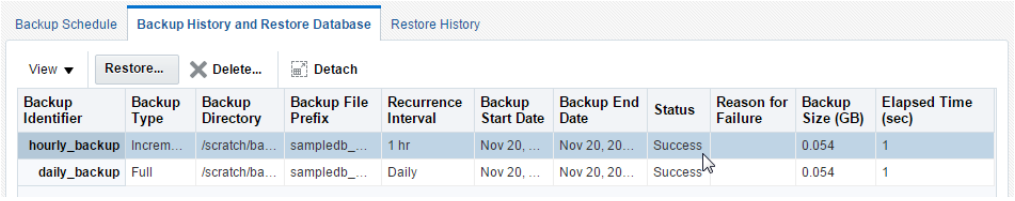
Delete a TimesTen database backup file

To delete a TimesTen database backup file entry or a failed TimesTen database backup entry, ensure that you are on the Backup History tab of the Backup and Restore page:

> **Note:** Ensure that you delete TimesTen backup files from the Backup History table. If you delete TimesTen backup files directly from the file system, Enterprise Manager does not remove the entry from the Backup History table.

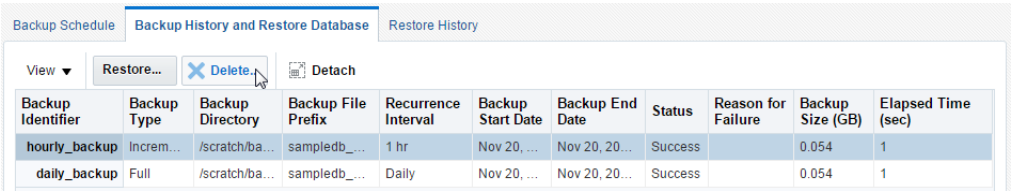
1. In the Backup History and Restore Database table, click in the row that identifies the **Backup Identifier** of your TimesTen backup file or failed TimesTen database backup entry.

Figure 11–23 Select your TimesTen database backup file



2. Click **Delete**.

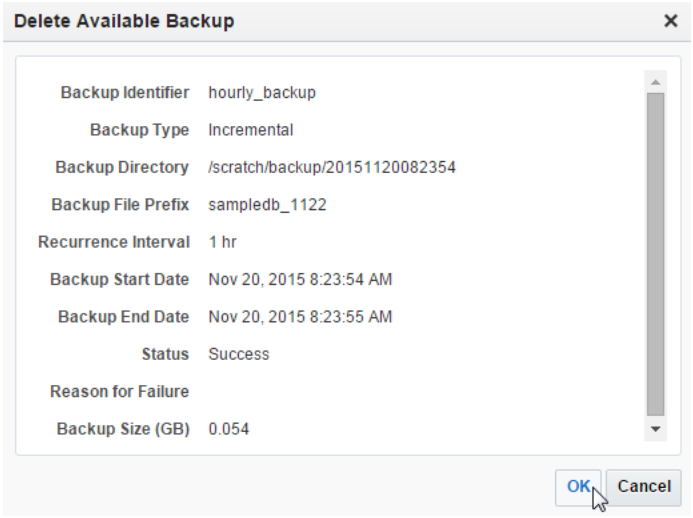
Figure 11–24 Click Delete



The Delete Available Backup dialog displays. Locate the OK button.

3. Click **OK**.

Figure 11–25 Click OK

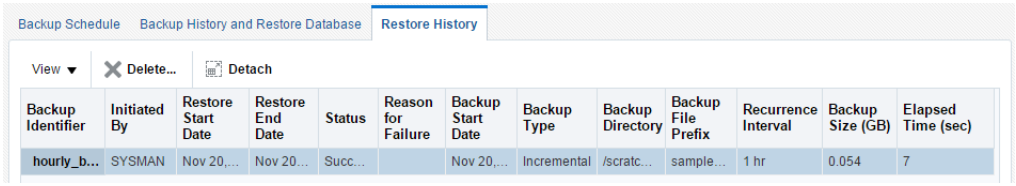


The Delete Available Backup dialog closes and the Backup History tab of the Backup and Restore page refreshes. You can verify that the TimesTen backup entry has been deleted by reviewing the Backup History tab of the Backup and Restore page. You should no longer see your TimesTen backup entry.

You have successfully deleted your TimesTen backup entry from Enterprise Manager and Enterprise Manager deletes the TimesTen backup from your file system.

Restore history

Figure 11–26 Restore History tab



The restore history tab enables you to review and delete TimesTen database recovery entries.

You can perform these actions on the restore history tab:

- Review a restore history entry
- Delete a restore history entry

Review a restore history entry

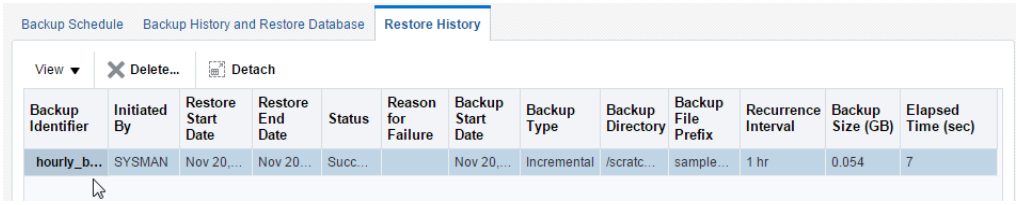
The restore history table shows all of the restore operations that have been performed on the TimesTen database from Enterprise Manager. This information is useful in keeping track of recovery operations and reviewing the causes of recovery failures.

Delete a restore history entry

To delete a TimesTen database restore entry ensure that you are on the Restore History tab of the Backup and Restore page:

1. In the Restore History table, click in the row that identifies the **Backup Identifier** of your TimesTen database restore entry.

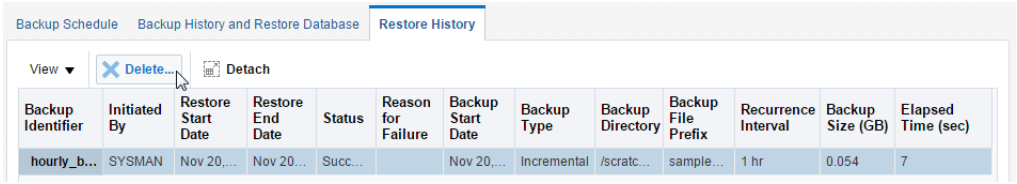
Figure 11–27 Select your TimesTen database recovery entry



Locate the Delete button.

2. Click **Delete**.

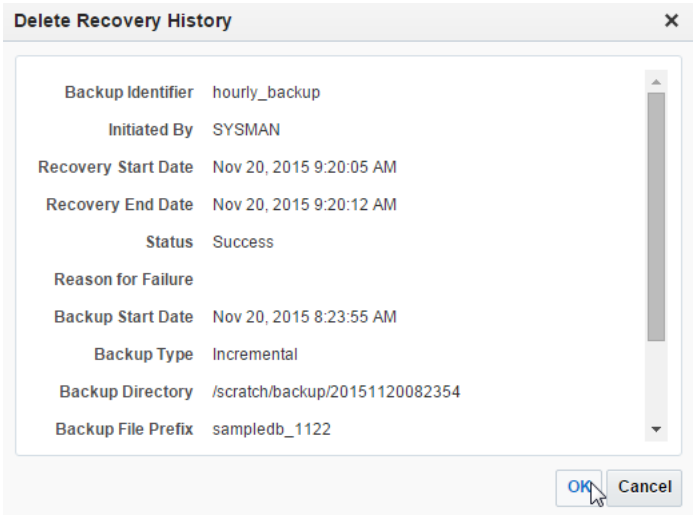
Figure 11–28 Click Delete



The Delete Recovery History dialog displays. Locate the OK button.

3. Click **OK**.

Figure 11–29 Click OK



The Delete Recovery History dialog closes and the Restore History tab of the Backup and Restore page refreshes. You can verify that the TimesTen restore history entry has been deleted by reviewing the Restore History tab of the Backup and Restore page. You should no longer see your TimesTen restore history entry.

You have successfully deleted your TimesTen restore history entry.

12

Working with the Cache Synchronization Metrics Page

This chapter describes the Cache Synchronization Metrics page.

Topics include:

- Viewing the cache synchronization metrics page
- Analyzing the cache synchronization metrics page

Viewing the cache synchronization metrics page

The cache synchronization metrics shows cache specific performance information. In order to view the metrics, ensure that you have configured a cache environment for your TimesTen target and ensure that the cache agent is up. For more information on configuring a cache environment, see the *Oracle TimesTen Application-Tier Database Cache User's Guide*.

To view the cache synchronization metrics, ensure that you are on the TimesTen target page. For information on navigating to the TimesTen target page, see "Navigating to the TimesTen target page" on page 2-1.

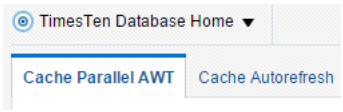
From the **TimesTen Database Home** menu, select **Monitoring**, then select **Cache Synchronization Metrics**.

Analyzing the cache synchronization metrics page

Figure 12–1 shows two cache synchronization metrics tabs that have been customized for TimesTen cache environments. Click a specific tab to view detailed cache synchronization metrics information.

Note: Only one of these tabs is available at a time: Cache Parallel AWT or Cache AWT. If you have set cache AWT parallelism, Enterprise Manager displays the Cache parallel AWT tab. If you have not set cache AWT parallelism, Enterprise Manager displays the Cache AWT tab. For more information on cache AWT parallelism, see "Configuring parallel propagation to Oracle Database tables" in the *Oracle TimesTen Application-Tier Database Cache User's Guide*.

Figure 12–1 Cache Synchronization Metrics tabs



A description of each area follows:

- Cache AWT
- Cache parallel AWT
- Cache autorefresh

Cache AWT

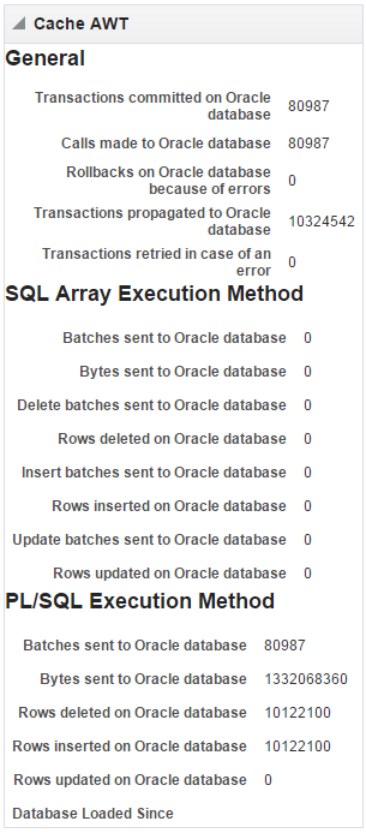
> **Note:** The Cache AWT tab is only available if you have not set cache AWT parallelism.

The cache AWT tab enables you to view performance information of AWT cache groups. It is divided into five regions:

- Cache AWT
- AWT transactions propagated to the Oracle database
- AWT transactions committed on Oracle database
- AWT batch performance
- AWT volume (MB/sec)

Cache AWT

Figure 12–2 Cache AWT region



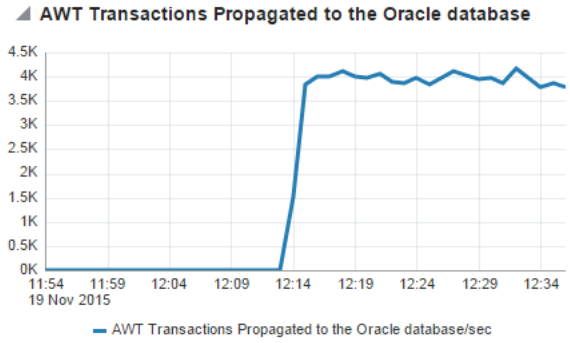
The cache AWT region shows the number of transactions committed on the Oracle database and the number of transactions rolled back on the Oracle database. The number of batches sent, bytes sent, rows deleted, rows inserted, and rows updated on the Oracle database for the SQL array execution method and the PL/SQL execution method of AWT cache are also displayed. The performance data is derived from values in the `SYS.SYSTEMSTATS` system table. For more information, see "SYS.SYSTEMSTATS" in the *Oracle TimesTen In-Memory Database System Tables and Views Reference*.

The method determines whether TimesTen uses the PL/SQL execution method or the SQL array execution method to apply changes to the Oracle database server for asynchronous writethrough propagation.

For more information about AWT cache methods, see "TimesTen Cache first connection attributes" in the *Oracle TimesTen In-Memory Database Reference.*

AWT transactions propagated to the Oracle database

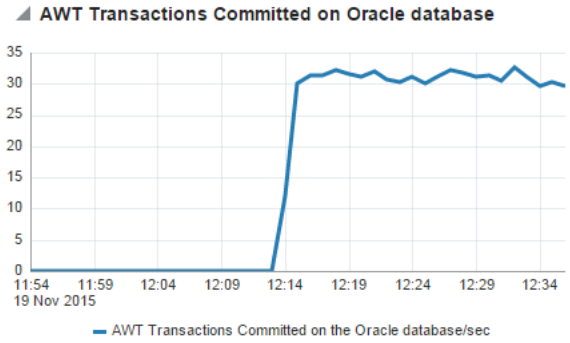
Figure 12–3 AWT Transactions Propagated to the Oracle Database region



The AWT transactions propagated to the Oracle database region uses a line graph to show the number of AWT transactions propagated to the Oracle database per second.

AWT transactions committed on Oracle database

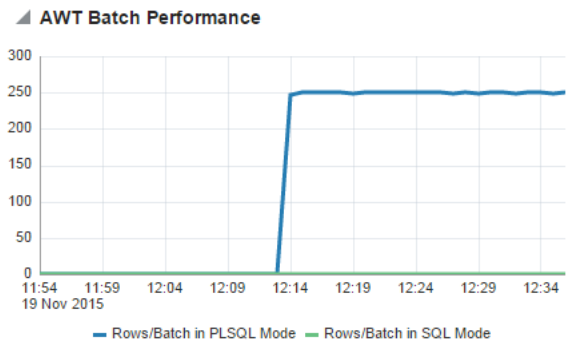
Figure 12–4 AWT Transactions Committed on Oracle Database region



The AWT transactions committed on Oracle database region uses a line graph to show the number of AWT transactions committed on the Oracle database per second.

AWT batch performance

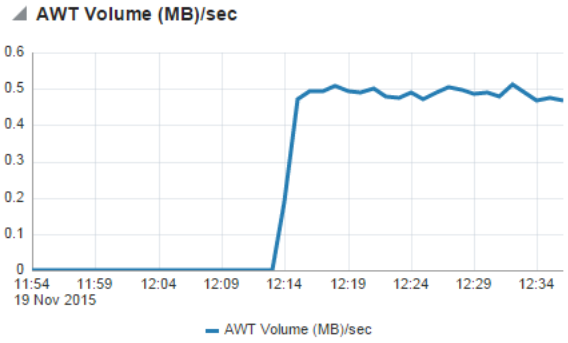
Figure 12–5 AWT Batch Performance region



The AWT batch performance region uses a line graph to show AWT Batch performance represented as a rate of rows per batch. SQL array execution mode is set with `CacheAWTMethod=0` and PL/SQL execution mode is set with `CacheAWTMethod=1`. For more information on `CacheAWTMethod`, see "CacheAWTMethod" in the *Oracle TimesTen In-Memory Database Reference*.

AWT volume (MB/sec)

Figure 12–6 AWT Volume (MB)/sec region



The AWT volume (MB/sec) region uses a line graph to show the AWT volume in Megabytes per second.

Cache parallel AWT

Note: The Cache parallel AWT tab is only available if you have set cache AWT parallelism. For more information on cache AWT parallelism, see "Configuring parallel propagation to Oracle Database tables" in the *Oracle TimesTen Application-Tier Database Cache User's Guide*.

The cache parallel AWT tab displays track and performance information about AWT cache groups that are configured with parallel propagation. For more information on parallel propagation for AWT cache groups, see "Configuring parallel propagation to Oracle Database tables" in the *Oracle TimesTen Application-Tier Database Cache User's Guide*. The cache parallel AWT tab is divided into two sub-tabs:

- Performance
- Tracks

Performance

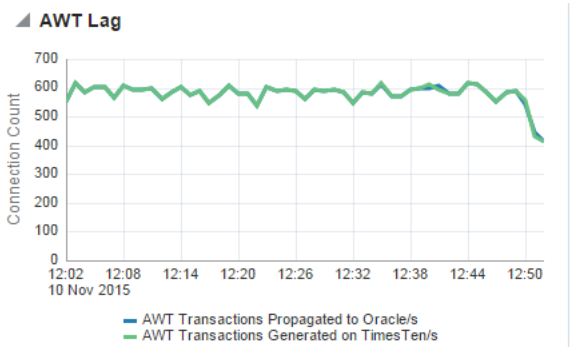
The performance sub-tab provides performance information about AWT cache groups that are configured with parallel propagation. The performance sub-tab is divided into four regions:

- AWT lag
- AWT bytes sent
- AWT batch performance

- AWT transactions

AWT lag

Figure 12–7 AWT Lag region

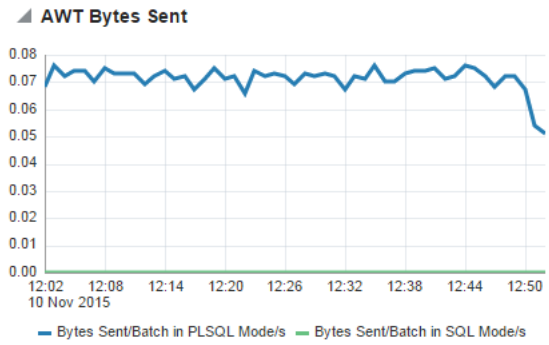


The AWT lag region uses a line graph to show the number of AWT transactions propagated to the Oracle database and generated on the TimesTen database per second.

It is important that the number of AWT transactions propagated to the Oracle database match the number of AWT transactions generated on the TimesTen database. For more information on troubleshooting AWT performance, see "AWT performance monitoring" in the *Oracle TimesTen In-Memory Database Troubleshooting Guide*.

AWT bytes sent

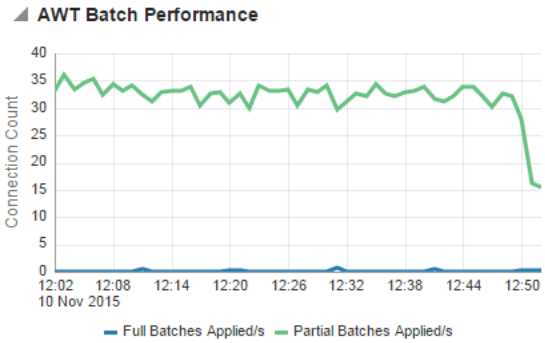
Figure 12–8 AWT Bytes Sent region



The AWT bytes sent region uses a line graph to show the bytes sent per batch in SQL mode and PLSQL mode per second. SQL array execution mode is set with `CacheAWTMethod`=0 and PL/SQL execution mode is set with `CacheAWTMethod`=1. For more information on `CacheAWTMethod`, see "CacheAWTMethod" in the *Oracle TimesTen In-Memory Database Reference*.

AWT batch performance

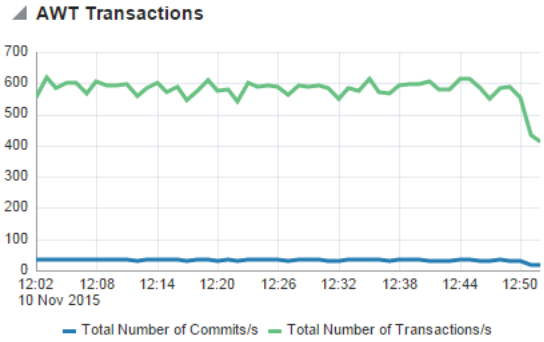
Figure 12–9 AWT Batch Performance region



The AWT batch performance region uses a line graph to show the number of full and partial batches applied per second.

AWT transactions

Figure 12–10 AWT Transactions region



The AWT transactions region uses a line graph to show the number of commits and transactions per second.

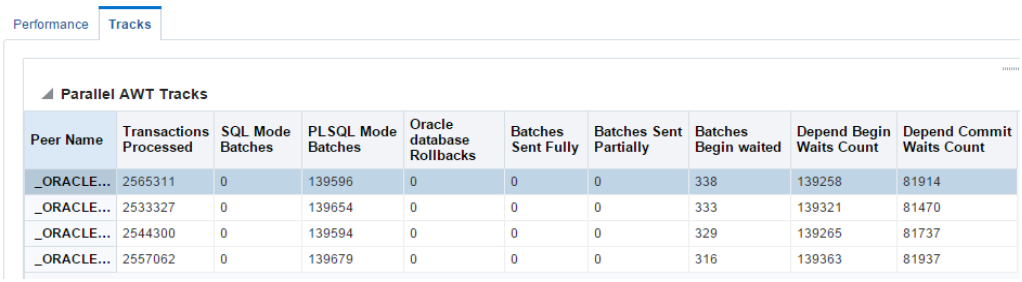
Tracks

The tracks sub-tab provides performance information about parallel AWT tracks. The tracks sub-tab is divided into two regions:

- Parallel AWT tracks
- Transactions processed on Oracle database

Parallel AWT tracks

Figure 12–11 Parallel AWT Tracks region



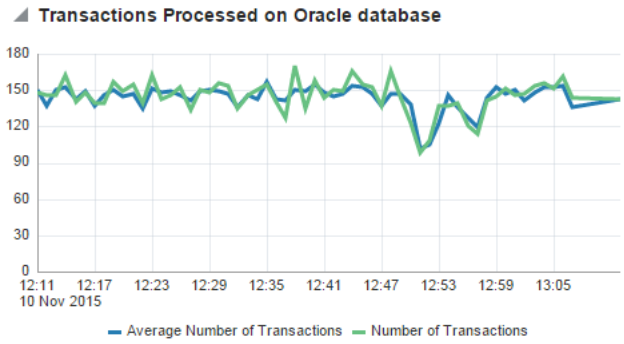
Peer Name	Transactions Processed	SQL Mode Batches	PLSQL Mode Batches	Oracle database Rollbacks	Batches Sent Fully	Batches Sent Partially	Batches Begin waited	Depend Begin Waits Count	Depend Commit Waits Count
_ORACLE...	2565311	0	139596	0	0	0	338	139258	81914
_ORACLE...	2533327	0	139654	0	0	0	333	139321	81470
_ORACLE...	2544300	0	139594	0	0	0	329	139265	81737
_ORACLE...	2557062	0	139679	0	0	0	316	139363	81937

The Parallel AWT tracks region shows the performance of the various parallel AWT tracks. Parallel AWT tracks are set with the `CacheAWTParallelism` connection attribute. For more information on the `CacheAWTParallelism` connection attribute, see "CacheAWTParallelism" in the *Oracle TimesTen In-Memory Database Reference*.

Click a peer name to review the number of transactions processed on the Oracle database for the parallel AWT track. The number of transactions processed on the Oracle database for the parallel AWT track display in the transactions processed on Oracle database region. For more information on the transactions processed on Oracle database region, see "Transactions processed on Oracle database" on page 12-8.

Transactions processed on Oracle database

Figure 12–12 Transactions Processed on Oracle database region



The transactions processed on Oracle database region uses a line graph to show the number of transactions processed on the Oracle database for the parallel AWT track.

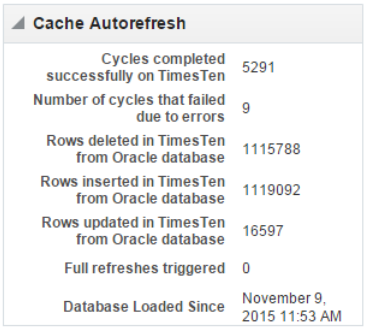
Cache autorefresh

The cache autorefresh tab enables you to view performance information of read-only cache groups. This tab is divided into three regions:

- Cache autorefresh
- Readonly cache
- Updates pending refresh

Cache autorefresh

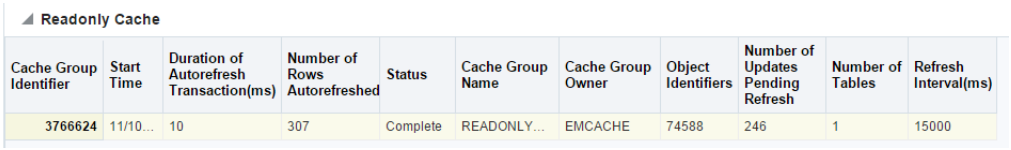
Figure 12–13 Cache Autorefresh region



The cache autorefresh region shows the number of rows deleted, inserted, and updated in TimesTen from the Oracle database. The number of cycles that completed successfully and the number of cycles that failed on TimesTen are also displayed. TimesTen starts collecting these metrics when the TimesTen database is loaded into memory.

Readonly cache

Figure 12–14 Readonly Cache region

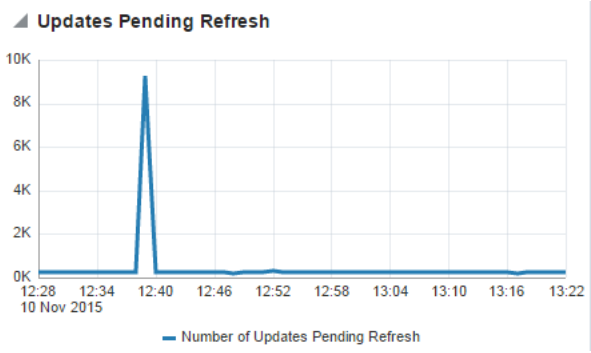


The readonly cache region displays information about the last autorefresh operations of each of the read-only cache groups of your TimesTen database. For more information on read-only cache groups, see "Read-only cache group" in the *Oracle TimesTen Application-Tier Database Cache User's Guide*.

Click a cache group identifier to review the number of updates pending refresh. The number of updates pending refresh display in the updates pending refresh region. For more information on the updates pending refresh region, see "Updates pending refresh" on page 12-10.

Updates pending refresh

Figure 12–15 Updates Pending Refresh region



The updates pending refresh region shows a line graph with the number of updates pending refresh for your specified cache group in the last hour.

13

Working with the Replication Monitor

This chapter describes the replication monitor page. The replication monitor page enables you to monitor and analyze TimesTen database targets that use AWT cache groups and that use replication to replicate objects to other databases.

Topics include:

- Viewing the replication monitor
- Analyzing information on the TimesTen replication monitor

Viewing the replication monitor

In order to view the replication monitor metrics, ensure that you have configured replication for your TimesTen database target and ensure that the replication agent is up.

Navigate to the TimesTen database target page. For information on navigating to the TimesTen database target page, see "Navigating to the TimesTen target page" on page 2-1.

From the **TimesTen Database Home** menu, select **Monitoring**, then select **Replication Monitor**.

Analyzing information on the TimesTen replication monitor

The TimesTen replication monitor page consists of two areas each of which have been customized specifically for TimesTen replication.

The top area consists of:

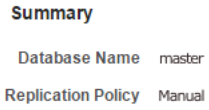
- Summary
- Status
- State

The bottom area consists of five tabs:

- Replication peers
- Replication log holds
- Transmitter thread status
- Receiver thread status
- Tracks

Summary

Figure 13–1 Summary region



This region identifies your database and the configuration of your replication policy:

- Database name

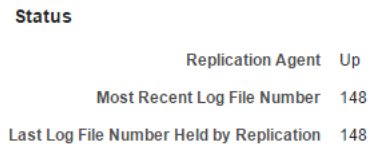
  This value is taken from the last part of the path to the database. For example, if the path to the database is `/var/tt/master`, the database name is `master`.

- Replication policy

  The replication policy is set with the `-repPolicy` option of the `ttAdmin` utility. The default value is manual. For more information on changing the replication policy, see "ttAdmin" in the *Oracle TimesTen In-Memory Database Reference*.

Status

Figure 13–2 Status region



The replication status region shows overall information relative to the current state of the replicated operations. If the most recent log file number is much greater than the last log file held by replication, then the replication agent has fallen behind in transmitting the recently created transactions.

Values for Replication Agent are Up or Down. If you have not configured a replication scheme, then the value is Down.

State

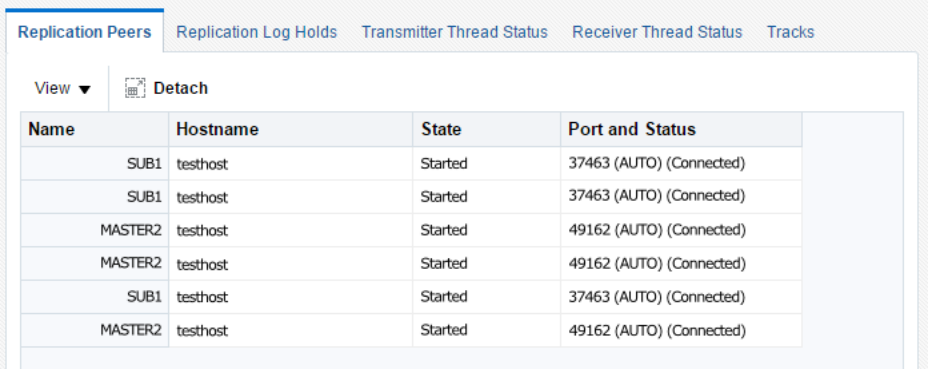
Figure 13–3 State region

The replication state region shows the current replication state of a database in an active standby pair.

The replication state region uses values from the `ttRepStateGet` built-in procedure. For more information about `ttRepStateGet`, see "ttRepStateGet" in the *Oracle TimesTen In-Memory Database Replication Guide*.

Replication peers

Figure 13–4 Replication Peers region

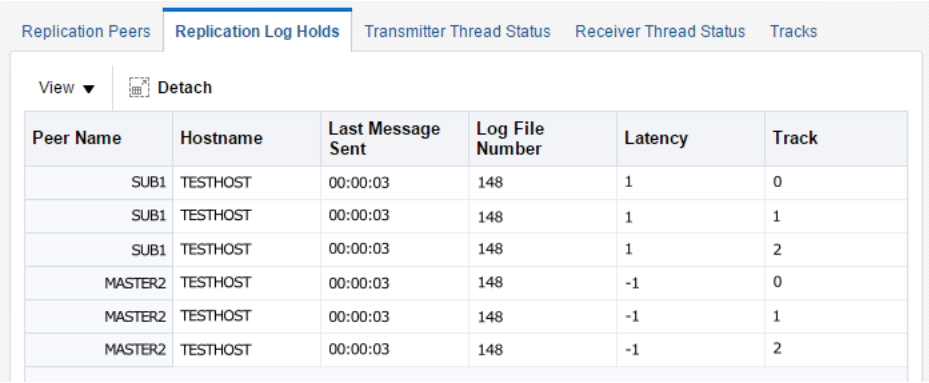


The replication peers table is common to any database regardless of whether the database is in the role of transmitter or receiver. The table shows the list of peers to the database.

The replication peers table uses values from the `TTREP.REPPEERS` replication table. You can also view these values with the `ttRepAdmin -showstatus` utility. For more information about the `TTREP.REPPEERS` replication table, see "TTREP.REPPEERS" in the *Oracle TimesTen In-Memory Database System Tables and Views Reference*. For more information about the `ttRepAdmin` utility, see "ttRepAdmin" in the *Oracle TimesTen In-Memory Database Reference*.

Replication log holds

Figure 13–5 Replication Log Holds region



The replication log holds table shows information for databases that replicate transactions to other databases. The table shows replication log holds.

The replication log holds table uses values from the `ttLogHolds` built-in procedure. For more information about the `ttLogHolds` utility, see "ttLogHolds" in the *Oracle TimesTen In-Memory Database Reference*.

Transmitter thread status

The transmitter thread status tab shows a detailed list and status of transmitter threads for this TimesTen database. This tab is populated for databases that replicate transactions to other databases. This tab is divided into two regions:

- Replication transmitters
- Transactions sent in the last hour

Replication transmitters

Figure 13–6 Replication Transmitters region

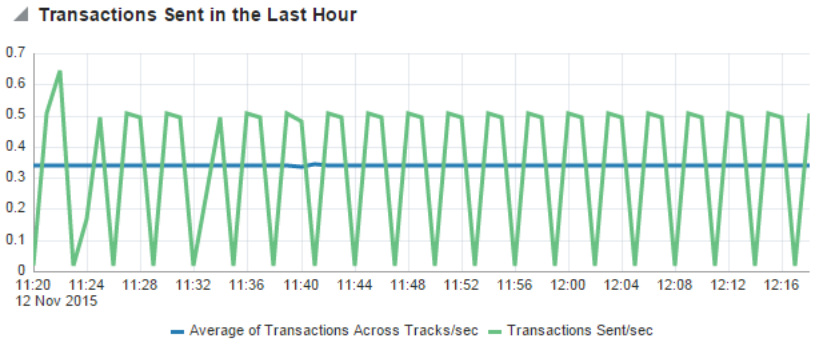
The replication transmitters table shows information for databases that replicate transactions to other databases. The table shows the status of transmitter threads for the database.

The replication transmitters table uses values from the `ttRepAdmin -showstatus` utility. For more information about the `ttRepAdmin` utility, see "ttRepAdmin" in the *Oracle TimesTen In-Memory Database Reference*.

Click a transmitter track to review the number of transactions sent on that track. The number of transactions sent in the last hour display in the transactions sent in the last hour region. For more information on the transactions sent in the last hour region, see "Transactions sent in the last hour" on page 13-5.

Transactions sent in the last hour

Figure 13–7 Transactions Sent in the Last Hour region



The transactions sent in the last hour region shows a line graph with the number of transactions sent for your specified transmitter track and average number of transactions sent per transmitter track per second.

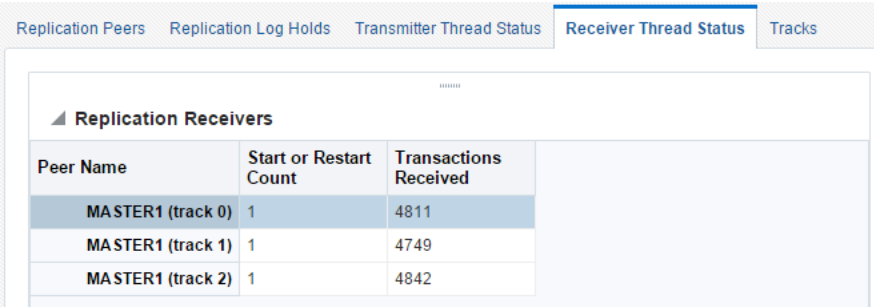
Receiver thread status

The receiver thread status tab shows a detailed list and status of receiver threads for this TimesTen database. This tab is populated for databases that receive transactions from other databases. This tab is divided into two regions:

- Replication receivers
- Transactions received in the last hour

Replication receivers

Figure 13–8 Replication Receivers region



The receiver threads status table shows information for databases that receive transactions from other databases. The table shows the status of receiver threads for the database.

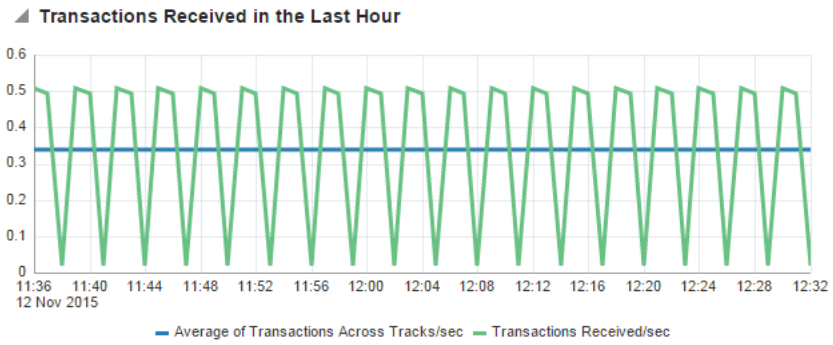
The replication receivers table uses values from the `ttRepAdmin -showstatus` utility. For more information about the `ttRepAdmin` utility, see "ttRepAdmin" in the *Oracle TimesTen In-Memory Database Reference*.

Click a receiver track to review the number of transactions received on that track. The number of transactions received in the last hour display in the transactions received in the last hour region. For more information on the transactions received in the last hour

region, see "Transactions received in the last hour" on page 13-6.

Transactions received in the last hour

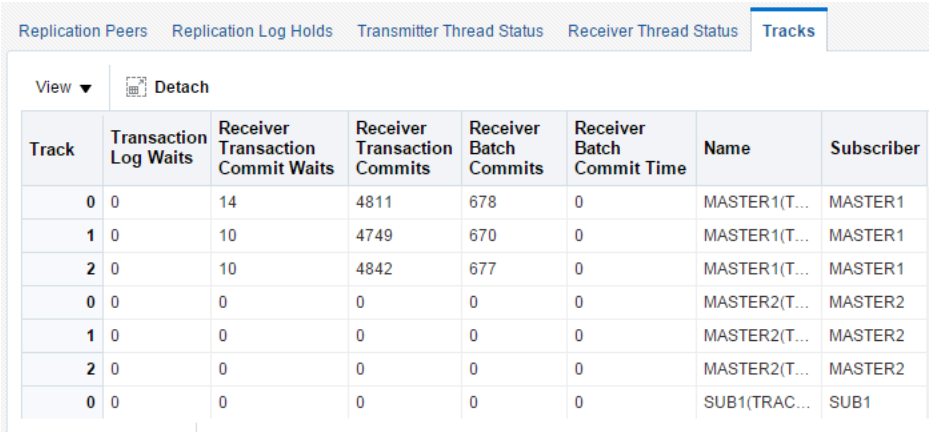
Figure 13–9 Transactions Received in the Last Hour region



The transactions received in the last hour region shows a line graph with the number of transactions received for your specified receiver track and average transactions received per receiver track per second.

Tracks

Figure 13–10 Tracks tab



Track	Transaction Log Waits	Receiver Transaction Commit Waits	Receiver Transaction Commits	Receiver Batch Commits	Receiver Batch Commit Time	Name	Subscriber
0	0	14	4811	678	0	MASTER1(T...	MASTER1
1	0	10	4749	670	0	MASTER1(T...	MASTER1
2	0	10	4842	677	0	MASTER1(T...	MASTER1
0	0	0	0	0	0	MASTER2(T...	MASTER2
1	0	0	0	0	0	MASTER2(T...	MASTER2
2	0	0	0	0	0	MASTER2(T...	MASTER2
0	0	0	0	0	0	SUB1(TRAC...	SUB1

The tracks tab uses a table to show performance information about each track. This information can help you determine the location of transaction bottlenecks.

14

Viewing Metrics

This chapter details metric information collected for your TimesTen database and TimesTen instance to assist you in determining the efficiency and performance of your target.

Topics include:

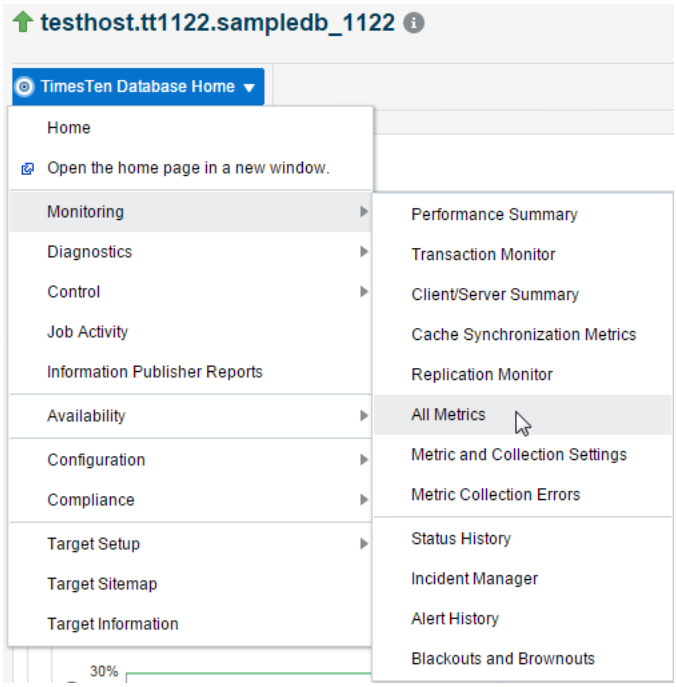
- Navigating to the TimesTen database metrics page
- Navigating to the TimesTen instance metrics page
- Viewing TimesTen database metrics
- Viewing TimesTen instance metrics

Navigating to the TimesTen database metrics page

Ensure that you are on the TimesTen database target page. For more information on navigating to the TimesTen database target page, see "Navigating to the TimesTen target page" on page 2-1.

1. From the **TimesTen Database Home** menu, select **Monitoring**, then select **All Metrics**.

Figure 14–1 TimesTen database All Metrics



The All Metrics page displays. Locate the name of the metric group.

2. Expand the metric group, and click the **name of the metric**.

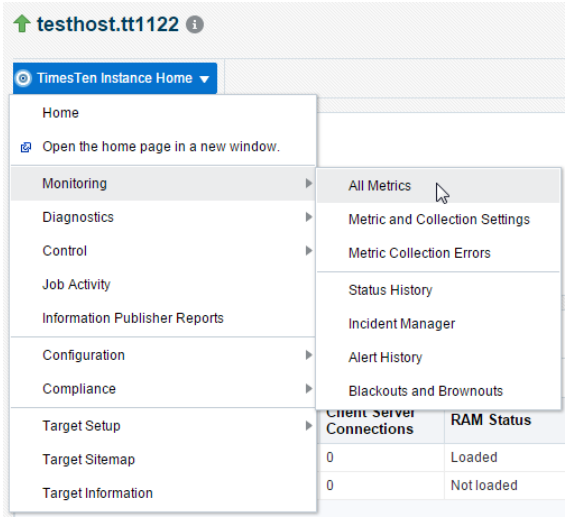
   The metric information displays in table format. For more information on TimesTen database metrics, see "Viewing TimesTen database metrics" on page 14-3.

Navigating to the TimesTen instance metrics page

Ensure that you are on the TimesTen instance target page. For more information on navigating to the TimesTen instance target page, see "Navigating to the TimesTen target page" on page 2-1.

1. From the or **TimesTen Instance Home** menu, select **Monitoring**, then select **All Metrics**.

Figure 14–2 TimesTen Instance All Metrics



The All Metrics page displays. Locate the name of the metric group.

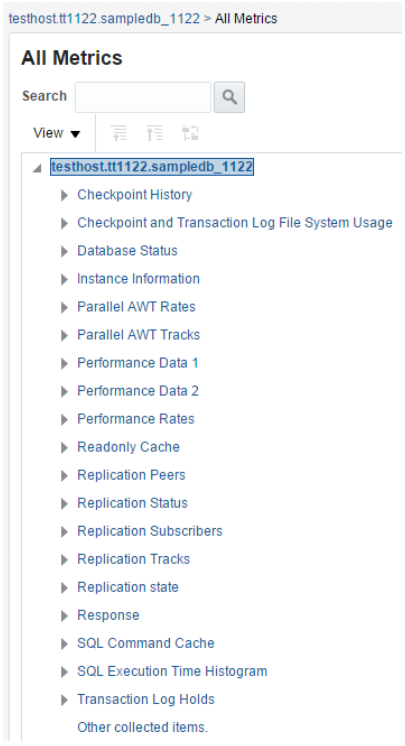
2. Expand the metric group, and click the **name of the metric**.

   The metric information displays in table format. For more information on TimesTen instance metrics, see "Viewing TimesTen instance metrics" on page 14-24.

Viewing TimesTen database metrics

There are twelve groups of TimesTen database metrics:

Figure 14–3 Groups of metrics



- Checkpoint history
- Checkpoint and transaction log file system usage
- Database status
- Instance information
- Parallel AWT rates
- Parallel AWT tracks
- Performance data
- Performance rates
- Readonly cache
- Replication peers
- Replication status
- Replication subscribers
- Replication tracks
- Replication state
- Response
- SQL command cache
- SQL execution time histogram
- Transaction log holds

Some metrics have predefined warning and critical thresholds. You can modify and add new thresholds. The Oracle Enterprise Manager Cloud Control issues alerts and warnings when the values collected for the metrics surpass the set threshold.

Checkpoint history

Table 14–1 lists each metric and describes the metrics.

Table 14–1 Checkpoint History

Metric	Description
Blocks currently in use out of total blocks	The number of blocks that are currently in use.
Bytes occupied by all blocks	The number of bytes occupied by all blocks.
Bytes occupied by blocks in use	The number of bytes occupied by the blocks that are in use.
Bytes occupied by dirty blocks	The number of bytes occupied by dirty blocks.
Bytes written in MB	Bytes written in megabytes.
Bytes written per sec	Bytes written per second.
Checkpoint sequence number	Checkpoint sequence number.
Dirty blocks written by this checkpoint	The number of dirty blocks written by this checkpoint.
Initiator	The initiator of the checkpoint request.
Percentage of the checkpoint that has been completed	Indicates the percentage of the checkpoint that has been completed. If there is no checkpoint in progress, the value is `NULL`.

Table 14–1 (Cont.) Checkpoint History

Metric	Description
Permanent blocks currently allocated in the database	Permanent blocks currently allocated in the database.
Status	Status of the checkpoint operation.
The database file number used by the checkpoint	The database file number used by the checkpoint.
The transaction log file number of the checkpoint log record	The transaction log file number of the checkpoint log record.
The transaction log file offset of the checkpoint log record	The transaction log file offset of the checkpoint log record.
Time when the checkpoint completed	Time when the checkpoint completed.
Time when the checkpoint was begun	Time when the checkpoint began.
TimesTen database error number for the failure	TimesTen error number that indicates the reason for the failure.
Total bytes written by this checkpoint	The total number of bytes written by this checkpoint.
Type	The type of checkpoint.

Checkpoint and transaction log file system usage

Table 14–2 lists each metric and describes the metrics.

Table 14–2 Checkpoint and Transaction Log File System Usage

Metric	Description
Checkpoint file system	Checkpoint file system.
Checkpoint file system mount Point	Checkpoint file system mount point.
Checkpoint file system size (MB)	Checkpoint file system size in megabytes.
Checkpoint file system space available (%)	Checkpoint file system space available (expressed as a percentage).
Checkpoint file system space available (MB)	Checkpoint file system space available in megabytes.
Transaction log file system	Transaction log file system.
Transaction log file system mount point	Transaction log file system mount point.
Transaction log file system size (MB)	Transaction log file system size in megabytes.
Transaction log file system space available (%)	Transaction log file system space available (expressed as a percentage).
Transaction log file system space available (MB)	Transaction log file system space available in megabytes.

Database status

Table 14–3 shows information about your database.

Table 14–3 Database status

Database information	Description
Cache agent running	1 if running; 0 if not running.

Table 14–3 (Cont.) Database status

Database information	Description
Replication agent running	1 if running; 0 if not running.
Time of first connection to database	Time of first connection to the database.

Instance information

Table 14–4 shows information about your TimesTen instance.

Table 14–4 Instance Information

Name	Description
Daemon port number	Daemon port number.
Instance name	TimesTen instance name.
Platform type	Platform type. For example, Linux/86_32.
TimesTen server port number	Server port number.
TimesTen server process ID	TimesTen server process identifier.
TimesTen server running	1 if running, 0 if not running.
TimesTen version number	Five-digit release number.

For more information on your TimesTen instance, see "ttStatus" in the *Oracle TimesTen In-Memory Database Reference*.

Parallel AWT rates

Table 14–5 shows information about your Parallel AWT rates.

Table 14–5 Parallel AWT Rates

Name	Description
Bytes sent in PL/SQL mode MB per sec	The number of megabytes sent in PL/SQL mode to the Oracle database per second.
Bytes sent in SQL mode MB per sec	The number of megabytes sent in SQL mode to the Oracle database per second.
Oracle database Rollbacks Timeout per sec	The timeout per second for rollbacks on the Oracle database.
Total AWT MB per sec	The number of megabytes sent for AWT to the Oracle database per second.
Total number of Oracle database commits per sec	The total number of Oracle database commits per second.
Total number of batches sent fully per sec	The total number of batches sent fully per second.
Total number of batches sent partially per sec	The total number of batches sent partially per second.
Total number of transactions per sec	The total number of transactions sent to the Oracle database per second.
Transaction master restart per sec	The number of transaction master restarts per second.

Table 14–5 (Cont.) Parallel AWT Rates

Name	Description
Transactions Generated on TimesTen database per sec	The number of transactions generated on the TimesTen database per second.
Transactions propagated to Oracle database per sec	The number of transactions propagated to the Oracle database per second.

Parallel AWT tracks

Table 14–6 shows information about your Parallel AWT tracks.

Table 14–6 Parallel AWT tracks

Name	Description
Batches Begin Waited	The number of AWT batches that had to wait on a begin dependency before being transmitted between the TimesTen database and the Oracle database.
Batches Begin Waits Count	The number of times the AWT batch had to check on a begin dependency to be satisfied before being transmitted between the TimesTen database and the Oracle database.
Commit Waited Count	The number of times the AWT batch had to check on a commit dependency to be satisfied before the AWT batch is committed on the Oracle database.
Full Batches	The number of full AWT batches transmitted between the TimesTen database and the Oracle database.
Oracle database Rollbacks	The number of rollbacks performed on the Oracle database.
PL/SQL Mode Batches	The number of AWT batches transmitted between the TimesTen database and the Oracle database in PL/SQL mode.
Partial Batches	The number of partial AWT batches transmitted between the TimesTen database and the Oracle database.
SQL Mode Batches	The number of AWT batches transmitted between the TimesTen database and the Oracle database in SQL mode.
Subscriber	The name of the subscriber database.
Track	The track number.
Transaction processed	The total number of transactions processed.
Transactions processed per sec	The number of transactions processed per second.

Performance data

Table 14–7 shows performance information.

Table 14–7 Performance Data

Metric	Description
Cache - AWT transactions committed on Oracle database	Number of AWT transactions committed on the Oracle database.
Cache - AWT transactions re-tries in case of an error	Number of times AWT transactions are re-tried on Oracle database.
Cache - Autorefresh cycles completed successfully	Number of autorefresh cycles completed successfully on TimesTen.

Table 14–7 (Cont.) Performance Data

Metric	Description
Cache - Autorefresh cycles that failed due to errors	Number of autorefresh cycles that failed because of errors.
Cache - Batches sent to Oracle database in SQL mode	Number of batches sent to the Oracle database in SQL mode (`CacheAWTMethod` = 0).
Cache - Bytes flushed to Oracle database	Number of bytes flushed to the Oracle database.
Cache - Bytes loaded due to dynamic load miss-local	Total number of bytes loaded from the Oracle database for servicing dynamic load misses for dynamic local cache groups.
Cache - Bytes loaded due to dynamic load misses	Total number of bytes loaded from the Oracle database for servicing dynamic load misses.
Cache - Bytes sent to Oracle database for SWT operations	Number of bytes sent to the Oracle database during SWT cache group operations.
Cache - Bytes sent to Oracle database in PL/SQL mode	Number of bytes sent to the Oracle database in PL/SQL mode (`CacheAWTMethod` = 1).
Cache - Bytes sent to Oracle database in SQL mode	Number of bytes sent to the Oracle database in SQL mode (`CacheAWTMethod` = 0).
Cache - Calls made to Oracle database for AWT	Number of calls made to the Oracle database for AWT.
Cache - Data loads from Oracle database for dynamic load misses	Number of data loads from the Oracle database when servicing dynamic load misses for dynamic local cache groups.
Cache - Data reqs. due to dyn. load on remote cache grid member	Number of requests for data received by this cache grid member from another cache grid member (because of a dynamic load on the remote cache grid member).
Cache - Data requests received for dirty data	Number of requests for data received by this cache grid member when the data requested is dirty (and must first be propagated to the Oracle database).
Cache - Data requests received where data not present	Number of requests for data received by this cache grid member when the data requested was not found in this member.
Cache - Data requests received where locked by transaction	Number of requests for data received by this cache grid member when the data requested was locked by a transaction on this member.
Cache - Delete batches sent to Oracle database in SQL mode	Number of delete batches sent to the Oracle database in SQL mode (`CacheAWTMethod` = 0).
Cache - Dynamic load misses from the Oracle database	Number of times a dynamic load miss had to load the requested data from the Oracle database.
Cache - Flush cache group executes	Number of flush cache group executions.
Cache - Full refreshes triggered during autorefresh operations	Number of full refreshes triggered during autorefresh operations.
Cache - Global dynamic cachegroup cache hits	Global dynamic cache group hits: Dynamic loads that find the data in the local cache grid member without requiring the data to be loaded from the Oracle database or another cache grid member.

Table 14–7 (Cont.) Performance Data

Metric	Description
Cache - Global dynamic cachegroup cache misses	Global dynamic cache group misses: Dynamic loads that do not find data initially in the local cache grid member (either need to go to the Oracle database or another cache grid member).
Cache - Insert batches sent to Oracle database in SQL mode	Number of insert batches sent to the Oracle database in SQL mode (`CacheAWTMethod` = 0).
Cache - Local dynamic cachegroup cache hits	Local dynamic cache group hits: Number of dynamic loads that find the requested data in the database.
Cache - Local dynamic cachegroup misses	Local dynamic cache group misses: Number of dynamic loads that do not find the requested data in the database and need to load the data from the Oracle database.
Cache - PL/SQL block batches sent to Oracle database	Number of PL/SQL block batches sent to the Oracle database. (`CacheAWTMethod` = 1).
Cache - Remote dynamic loads	Dynamic loads that do not find data in the local cache grid member and successfully load the required data from another cache grid member.
Cache - Rollbacks on Oracle database because of errors	Number of rollbacks on Oracle database because of errors.
Cache - Rows deleted in the TimesTen database by autorefresh	Number of rows deleted from TimesTen during autorefresh from the Oracle database.
Cache - Rows deleted on Oracle database in PL/SQL	Number of rows deleted from Oracle database in PL/SQL mode (`CacheAWTMethod` = 1).
Cache - Rows deleted on Oracle database in SQL	Number of rows deleted from the Oracle database in SQL mode (`CacheAWTMethod` = 0).
Cache - Rows flushed to Oracle database	Number of rows flushed to the Oracle database.
Cache - Rows in SWT cache groups deleted on Oracle database	Number of rows in SWT cache groups deleted from Oracle database.
Cache - Rows in SWT cache groups inserted on Oracle database	Number of rows in SWT cache groups inserted into Oracle database.
Cache - Rows in SWT cache groups updated on Oracle database	Number of rows in SWT cache groups updated on Oracle database.
Cache - Rows inserted in the TimesTen database by autorefresh	Number of rows inserted into TimesTen during autorefresh from the Oracle database.
Cache - Rows inserted on Oracle database in PL/SQL mode	Number of rows inserted into Oracle database in PL/SQL mode (`CacheAWTMethod` = 1).
Cache - Rows inserted on Oracle database in SQL mode	Number of rows inserted into Oracle database in SQL mode (`CacheAWTMethod` = 0).
Cache - Rows updated in the TimesTen database by autorefresh	Number of rows updated in TimesTen during autorefresh from the Oracle database.

Table 14–7 (Cont.) Performance Data

Metric	Description
Cache - Rows updated on Oracle database in PL/SQL mode	Number of rows updated on Oracle database in PL/SQL mode (`CacheAWTMethod` = 1).
Cache - Rows updated on Oracle database in SQL mode	Number of rows updated on Oracle database in SQL mode (`CacheAWTMethod` = 0).
Cache - Transactions propagated from TimesTen to Oracle database	Number of TimesTen transactions propagated to the Oracle database.
Cache - Update batches sent to Oracle database in SQL mode	Number of updated batches sent to the Oracle database in SQL mode (`CacheAWTMethod` = 0).
Cache grid - Cache grid members that have attached so far	Number of attach operations.
Cache grid - Detach operations	Number of detach operations.
Checkpoint - Bytes written during last checkpoint	Number of bytes written during last checkpoint.
Checkpoint - Checkpoint bytes written during database recovery	Number of bytes written for checkpointing during database recovery.
Checkpoint - Checkpoint volume in bytes	Number of bytes written for checkpointing.
Checkpoint - Checkpoint writes	Number of checkpoint writes.
Checkpoint - Checkpoints completed	Number of checkpoints completed.
Checkpoint - End time of last checkpoint begun	End time of last checkpoint begun.
Checkpoint - Fuzzy checkpoints completed	Number of fuzzy checkpoints completed.
Checkpoint - Start time of last checkpoint begun	Start time of last checkpoint begun.
Checkpoint - Status of last checkpoint begun	Status of last checkpoint begun. For instance, completed.
Checkpoint - Type of last checkpoint begun	Type of last checkpoint begun. For example, fuzzy.
Checkpoint - Whether last checkpoint begun had an error	Whether last checkpoint begun had an error.
Client/Server - Round trips	Number of client/server round-trips.
Client/Server - ALTER statements executed by server	Number of `ALTER` statements executed by server.
Client/Server - Bytes received by server	Number of client/server bytes received by server.
Client/Server - Bytes transmitted by server	Number of client/server bytes transmitted by server.

Table 14–7 (Cont.) Performance Data

Metric	Description
Client/Server - CREATE statements executed by server	Number of `CREATE` statements executed by server.
Client/Server - DELETE statements executed by server	Number of `DELETE` statements executed by server.
Client/Server - DROP statements executed by server	Number of `DROP` statements executed by server.
Client/Server - Disconnects	Number of client/server disconnects.
Client/Server - INSERT statements executed by server	Number of `INSERT` statements executed by server.
Client/Server - MERGE statements executed by server	Number of `MERGE` statements executed by server.
Client/Server - SELECT statements executed by server	Number of `SELECT` statements executed by server.
Client/Server - Table rows deleted by server	Number of table rows deleted by server.
Client/Server - Table rows inserted by server	Number of table rows inserted by server.
Client/Server - Table rows updated by server	Number of table rows updated by server.
Client/Server - Transaction rollbacks by server	Number of transaction rollbacks by server.
Client/Server - Transactions committed by server	Number of transactions committed by server.
Client/Server - UPDATE statements executed by server	Number of `UPDATE` statements executed by server.
Connections - Client-server connections established	Cumulative number of client/server connections established.
Connections - Database connects established	Cumulative number of database connections established.
Connections - Database connects exceeding configured maximum	Cumulative number of database connection thresholds exceeded.
Connections - Database disconnects	Cumulative number of database disconnections.
Connections - Direct linked database connections established	Cumulative number of direct mode database connections established.
Connections - First database connections established	Number of first database connections established.
DB - Deletes from range indexes	Number of rows deleted from range indexes.
DB - Full table scans	Number of full table scans.

Table 14–7 (Cont.) Performance Data

Metric	Description
DB - Hash index inserts during database recovery index rebuild	Number of rows inserted into hash indexes during index rebuild phase of database recovery.
DB - Hash indexes scanned	Number of hash indexes scanned.
DB - Hash indexes scanned during replication	Number of hash indexes scanned during replication operations (such as insert, update, and delete operations on tables).
DB - Indexes rebuilt	Number of indexes rebuilt.
DB - Inserts into range indexes	Number of rows inserted into range indexes.
DB - LRU aging commits done since database loaded	Number of LRU aging commits since the database was loaded into memory.
DB - LRU aging cycles completed since database loaded	Number of LRU aging cycles completed since the database was loaded into memory.
DB - LRU aging high threshold crossings since database loaded	Number of times LRU aging high threshold has been reached since the database was loaded into memory.
DB - Merge joins done	Number of merge joins done.
DB - Nested loop joins done	Number of nested loop joins done.
DB - Range index inserts during database recovery index rebuild	Number of rows inserted into range indexes during index rebuild phase of database recovery
DB - Range indexes scanned	Number of temporary indexes scanned.
DB - Range indexes scanned during replication	Number of temporary indexes scanned during replication operations.
DB - Rows deleted during LRU aging since database loaded	Number of rows deleted during LRU aging since the database was loaded into memory.
DB - Rows deleted during time-based aging since database loaded	Number of rows deleted during time-based aging since the database was loaded into memory.
DB - Rows deleted from hash indexes	Number of rows deleted from hash indexes.
DB - Rows fetched from hash indexes	Number of rows fetched from hash indexes.
DB - Rows fetched from hash indexes during replication	Number of rows fetched from hash indexes during replication operations.
DB - Rows fetched from range indexes during replication	Number of rows fetched from range indexes during replication operations.
DB - Rows fetched from temp indexes during replication	Number of rows fetched from temporary indexes during replication operations.
DB - Rows fetched from temporary indexes	Number of rows fetched from temporary indexes.
DB - Rows inserted into hash indexes	Number of rows inserted into hash indexes.

Table 14–7 (Cont.) Performance Data

Metric	Description
DB - Rows not deleted using LRU aging because of lock contention	Number of rows that were not deleted using LRU aging because of lock contention since the database was loaded into memory.
DB - Rows not deleted using time-based aging - lock contention	Number of rows that were not deleted using time-based aging because of lock contention since the database was loaded into memory.
DB - Sorts done	Number of sorts done.
DB - Table rows deleted	Number of table rows deleted.
DB - Table rows inserted	Number of table rows inserted.
DB - Table rows read	Number of table rows read.
DB - Table rows updated	Number of table rows updated.
DB - Temporary indexes created	Number of temporary indexes created.
DB - Temporary indexes scanned	Number of range indexes scanned.
DB - Temporary indexes scanned during replication	Number of range indexes scanned during replication operations (such as insert, update, and delete operations on tables).
DB - Time-based aging commits done since the database loaded	Number of time-based aging commits since the database was loaded into memory.
DB - Time-based aging cycles completed since database loaded	Number of time-based aging cycles completed since the database was loaded into memory.
DB - Times LRU aging low threshold reached since database loaded	Number of times LRU aging low threshold has been reached since the database was loaded into memory.
DB - Tuples fetched from range indexes	Number of rows fetched from range indexes.
DB - Updates on range indexes	Number of rows updated on range indexes.
Lock - Deadlocks	Number of deadlocks.
Lock - Locks acquired for DML activity	Number of locks acquired for DML activity.
Lock - Locks acquired for table scans	Number of locks acquired for table scans.
Lock - Locks granted immediately	Number of locks granted immediately.
Lock - Locks granted that required waiting	Number of locks granted that required waiting.
Lock - Requests denied due to timeouts	Number of lock requests denied due to timeouts.
Log - Bytes inserted into the log buffer	Number of bytes inserted into the log buffer.
Log - Bytes of log read during DB recovery	Number of log bytes read during database recovery.

Table 14–7 (Cont.) Performance Data

Metric	Description
Log - Bytes read from log for commits	Number of bytes read from the log for commit processing.
Log - Earliest log file currently	Earliest log file that currently exists in the database.
Log - File system reads	Number of file system reads.
Log - File system reads for commits	Number of file system reads from the log for commit processing.
Log - File system writes	Number of file system writes.
Log - Last log file number	Number of last log file.
Log - Log files generated so far	Number of log files generated so far.
Log - Log records inserted into the log buffer	Number of log records inserted into the log buffer.
Log - Most recent log file present	Most recent log file present.
Log - Times the log is synched to disk	Number of times the log has been synchronized to disk.
Log - Total waits for inserts	Number of times a thread was delayed while trying to insert a log record into the log buffer because the log buffer was full. If this value is increasing, it generally indicates that the log buffer is too small.
Memory - Highest amount of permanent region in use - MB	Highest amount of memory of the permanent data region in use since the first connection to the database.
Memory - Highest amount of temporary region in use - MB	Highest amount of memory of the temporary data region in use since the first connection to the database.
Memory - MB of permanent space in use	Size of permanent region currently in use.
Memory - MB of temporary space in use	Size of temporary region currently in use.
Memory - Percent of permanent space in use	Percent of the permanent region space currently being used.
Memory - Percent of temporary space in use	Percent of the temporary region space currently being used.
PL/SQL - Cache hit ratio for object handles	The cache hit ratio for PL/SQL object handles.
PL/SQL - Cache hit ratio for pin requests	The cache hit ratio for PIN requests.
PL/SQL - Lock requests for a PL/SQL object	Number of times a lock was requested for a PL/SQL object.
PL/SQL - Object invalidations due to dependent object changes	Total number of times objects in the namespace were marked invalid because a dependent object was modified.
PL/SQL - PINs of objects not 1st performed since creation	Any PIN of an object that is not the first PIN performed since the object handle was created and which requires loading the object from the database.

Table 14–7 (Cont.) Performance Data

Metric	Description
PL/SQL - Times PL/SQL object's handle found in memory	Number of times a PL/SQL object's handle was found in memory.
PL/SQL - Times a PIN was requested for PL/SQL objects	Number of times a PIN was requested for PL/SQL objects.
PL/SQL - Times all metadata of library object found in memory	Number of times all of the metadata pieces of the library object were found in memory.
PL/SQL - Total heap (MB) for PL/SQL on this database connection	Total amount of heap memory in megabytes allocated to PL/SQL for the database connection.
PL/SQL - Total times a deferred cleanup occurred	Number of times a deferred cleanup occurred.
Replication - Last log file number held by replication	Number of last log file held by replication.
Replication - Transactions replicated from this database	Number of replicated transactions generated on the local database that are being replicated to at least one peer database.
Statement - ALTER statements executed	Number of `ALTER` statements executed.
Statement - Automatic statement reprepares	Number of automatic statement reprepares.
Statement - CREATE statements executed	Number of `CREATE` statements executed.
Statement - Command cache misses during statement prepare	Number of command cache misses during statement prepare.
Statement - DELETE statements executed	Number of `DELETE` statements executed.
Statement - DROP statements executed	Number of `DROP` statements executed.
Statement - INSERT statements executed	Number of `INSERT` statements executed.
Statement - MERGE statements executed	Number of `MERGE` statements executed.
Statement - SELECT statements executed	Number of `SELECT` statements executed.
Statement - Statement prepares	Number of statement prepares.
Statement - Statement reprepares (forced or automatic)	Number of statement reprepares including forced and automatic.
Statement - Total SQL statements executed	Number of SQL statements executed.
Statement - UPDATE statements executed	Number of `UPDATE` statements executed.

Table 14–7 (Cont.) Performance Data

Metric	Description
Transaction - Durable replicated transaction commits	Number of durable replicated transaction commits.
Transaction - Durable transaction commits	Number of durable transaction commits.
Transaction - Nondurable replicated transaction commits	Number of nondurable replicated transaction commits.
Transaction - Nondurable transaction commits	Number of nondurable transaction commits.
Transaction - Replication initiated transaction commits	Number of replication initiated transaction commits.
Transaction - Transaction rollbacks	Number of transaction rollbacks.
Transaction - Transactions committed	Number of durable and non-durable transaction committed.
Transaction - XLA initiated transaction commits	Number of XLA initiated transaction commits.
Workload - 10th most commonly executed SQL statement	Tenth most commonly executed SQL statement.
Workload - 2nd most commonly executed SQL statement	Second most commonly executed SQL statement.
Workload - 2nd most commonly prepared SQL statement	Second most commonly prepared SQL statement.
Workload - 2nd most commonly reprepared SQL statement	Second most commonly reprepared SQL statement.
Workload - 3rd most commonly executed SQL statement	Third most commonly executed SQL statement.
Workload - 3rd most commonly prepared SQL statement	Third most commonly prepared SQL statement.
Workload - 3rd most commonly reprepared SQL statement	Third most commonly reprepared SQL statement.
Workload - 4th most commonly executed SQL statement	Fourth most commonly executed SQL statement.
Workload - 4th most commonly prepared SQL statement	Fourth most commonly prepared SQL statement.
Workload - 4th most commonly reprepared SQL statement	Fourth most commonly reprepared SQL statement.

Table 14–7 (Cont.) Performance Data

Metric	Description
Workload - 5th most commonly executed SQL statement	Fifth most commonly executed SQL statement.
Workload - 5th most commonly prepared SQL statement	Fifth most commonly prepared SQL statement.
Workload - 5th most commonly reprepared SQL statement	Fifth most commonly reprepared SQL statement.
Workload - 6th most commonly executed SQL statement	Sixth most commonly executed SQL statement.
Workload - 7th most commonly executed SQL statement	Seventh most commonly executed SQL statement.
Workload - 8th most commonly executed SQL statement	Eighth most commonly executed SQL statement.
Workload - 9th most commonly executed SQL statement	Ninth most commonly executed SQL statement.
Workload - Cache hits	Number of hits inside cache.
Workload - Client/Server connections	The number of current active client/server connections on the TimesTen database.
Workload - Commands prepared	Number of commands prepared (compiled).
Workload - Commands reprepared	Number of commands reprepared.
Workload - Communication with Oracle database for dynamic load	Number of executes from the Oracle database using dynamic load.
Workload - Cursor opens	Number of cursor opens.
Workload - Cursors closed	Number of cursor closed.
Workload - Direct linked connections	The number of current direct mode connections on the database.
Workload - Fetches from Oracle database using dynamic load	Number of fetches from the Oracle database using dynamic load.
Workload - Most commonly executed SQL statement	Most commonly executed SQL statement.
Workload - Most commonly prepared SQL statement	Most commonly prepared SQL statement.
Workload - Most commonly reprepared SQL statement	Most commonly reprepared SQL statement.
Workload - Passthrough count	Number of passthrough operations executed.
Workload - System connections	The sum of the current active subdaemon, replication agent, and cache connect agent connections.

Table 14–7 (Cont.) Performance Data

Metric	Description
Workload - Total number of connections	Sum of all current active connections on the TimesTen database.

Performance rates

Performance rates are expressed as a rate (For example, X times per minute). These rates are considered instantaneous rates because the value is the rate in the last minute or the per-minute rate (if you have changed the most recent collection interval to a value other than one minute).

Table 14–8 shows each metric and describes the metrics.

Table 14–8 Performance Rates

Metric	Description
Cache - Rows per batch in PL/SQL mode	The number of rows sent per batch in PL/SQL mode to the Oracle database.
Cache - Rows per batch in SQL mode	The number of rows sent per batch in SQL mode to the Oracle database.
Cache - Total AWT MB per sec	The number of megabytes of AWT transactions sent per second to the Oracle database.
Cache - Transactions committed on Oracle database per sec	The number of transactions committed per second on the Oracle database.
Cache - Transactions propagated to Oracle database per sec	The number of transactions propagated per second to the Oracle database.
Cache grid - Cache grid attaches per minute	The number of cache grid attaches per minute.
Cache grid - Cache grid detaches per minute	The number of cache grid detaches per minute.
Cache grid - Cache grid global hit percent	The number of cache grid global hit percent (percent is found in local grid member).
Cache grid - Cache grid global hits per sec	The number of cache grid global hits per second.
Cache grid - Cache grid global misses per sec	The number of cache grid global misses per second.
Cache grid - Cache grid local hits per sec	The number of cache grid local hits per second.
Cache grid - Cache grid local misses per sec	The number of cache grid local misses per second.
Cache grid - Cache grid misses filled from Oracle database per sec	The number of cache grid misses filled from the Oracle database per second.
Client/Server - ALTER statements executed by server per sec	The number of `ALTER` statements executed per second by the TimesTen server.
Client/Server - Bytes received by server per sec	The number of client/server bytes received per second by the TimesTen server.

Table 14–8 (Cont.) Performance Rates

Metric	Description
Client/Server - Bytes transmitted by server per sec	The number of client/server bytes transmitted per second by the TimesTen server.
Client/Server - CREATE statements executed by server per sec	The number of `CREATE` statements executed per second by the TimesTen server.
Client/Server - DELETE statements executed by server per sec	The number of `DELETE` statements executed per second by the TimesTen server.
Client/Server - DROP statements executed by server per sec	The number of `DROP` statements executed per second by the TimesTen server.
Client/Server - INSERT statements executed by server per sec	The number of `INSERT` statements executed per second by the TimesTen server.
Client/Server - MERGE statements executed by server per sec	The number of `MERGE` statements executed per second by the TimesTen server.
Client/Server - Round trips per sec	The number of client/server round-trips per second.
Client/Server - SELECT statements executed by server per sec	The number of `SELECT` statements executed per second by the TimesTen server.
Client/Server - Table rows deleted by server per sec	The number of table rows deleted per second by the TimesTen server.
Client/Server - Table rows inserted by server per sec	The number of table rows inserted per second by the TimesTen server.
Client/Server - Table rows updated by server per sec	The number of table rows updated per second by the TimesTen server.
Client/Server - Transaction rollbacks by server per sec	The number of transaction rollbacks per second by the TimesTen server.
Client/Server - Transactions committed by server per sec	The number of transactions committed per second by the TimesTen server.
Client/Server - UPDATE statements executed by server per sec	The number of `UPDATE` statements executed per second by the TimesTen server.
DB - Table rows deleted per minute	The number of table rows deleted per minute in the TimesTen database.
DB - Table rows inserted per minute	The number of table rows inserted per minute in the TimesTen database.
DB - Table rows read per minute	The number of table rows read per minute in the TimesTen database.
DB - Table rows updated per minute	The number of table rows updated per minute in the TimesTen database.
Lock - Deadlocks per minute	The number of deadlocks per minute.
Lock - Immediate lock grants per minute	The number of nonblocking locks acquired per minute.

Table 14–8 (Cont.) Performance Rates

Metric	Description
Lock - Lock grants after wait per minute	The number of blocking locks acquired per minute.
Lock - Lock timeouts per minute	The number of lock timeouts per minute.
Lock - Percent locks granted immediately	The percent of locks granted immediately versus having to wait.
Log - Log buffer MB inserted per sec	The number of megabytes inserted into the log buffer per second.
Log - Log buffer waits per minute	The number of times per minute a thread had to wait because the log buffer was full.
Log - Log bytes to disk per minute in MB	The number of megabytes of log that was written to disk per minute.
Log - Log flushes to file system per minute	Number of times per minute the log buffer was written to the file system.
Log - Log reads from file system per minute	The number of times per minute a log read could not be satisfied from the in memory buffer.
Prepares per minute to executes per minute ratio	The ratio of the prepares per minutes to executes per minute.
Replication - Transactions replicated per minute	The number of transactions replicated to a peer per minute.
Statement - DELETE statements executed per sec	The number of `DELETE` statements executed per second.
Statement - INSERT statements executed per sec	The number of `INSERT` statements executed per second.
Statement - MERGE statements executed per sec	The number of `MERGE` statements executed per second.
Statement - SELECT statements executed per sec	The number of `SELECT` statements executed per second.
Statement - Total statements executed per sec	The total number of statements executed per second.
Statement - UPDATE statements executed per sec	The number of `UPDATE` statements executed per second.
Transaction - Transaction rollbacks per sec	The number of transactions rolled back per second.
Transaction - Transactions committed per sec	The number of transactions committed per second.
Transaction - Transactions durably committed per sec	The number of durable transactions committed per minute.
Workload - Commands prepared per minute	The number of SQL commands prepared (compiled) per minute.
Workload - Commands reprepared per minute	The number of SQL commands reprepared (recompiled) per minute.
Workload - Connects per minute	The number of connections to the database per minute.
Workload - Disconnects per minute	The number of disconnects from the database per minute.

Table 14–8 (Cont.) Performance Rates

Metric	Description
Workload - Queries per sec	The number of queries per second.

Readonly cache

Table 14–10 shows readonly cache metrics and describes the metrics.

Table 14–9 Readonly Cache

Metric	Description
Auto refresh status	The status of the autorefresh operation.
Cache group ID	The identifier of the cache group.
Cache group name	The name cache group.
Cache group owner	The owner of the cache group.
Object Identifiers	The object identifier of the table on the Oracle database.
Refresh Interval	The refresh interval for the cache group.
Refresh Time Spent(ms)	The total time spent performing refresh operations.
Rows autorefreshed	The number of rows that have been autorefreshed.
Start Time	The timestamp of when the last autorefresh was performed.
Updates pending refresh	The number of updates that are pending refresh.

Replication peers

Table 14–10 shows replication peers metrics and describes the metrics.

Table 14–10 Replication Peers

Metric	Description
Replication peer host name	Name of the system that hosts replication.
Replication peer name	If replication type is DNS, name of the database to be queried. If replication type is PEERS, name of the database that is a replication peer to this database.
Replication port number	TCP/IP port used by the replication agent to listen for connections from the transmitter threads of remote replication agents. The default is 0 indicating that this port has been assigned automatically to the replication agent, rather than being specified as part of a replication scheme.
Replication protocol	Protocol used by replication to communicate between peers.
Replication state	Current replication state of the replication peer in relation to the queried database.
Type	The replication type.

Replication status

Table 14–11 shows replication status information.

Table 14–11 Replication Status

Name	Description
Replication peer name	The replication peer name.
Replication thread type	The replication thread type. Valid values are Transmitter or Receiver.
Start or restart count	Start or restart count.
Transactions sent or received	The total number of transactions sent or received.
Transactions sent or received per sec	The number of transactions sent or received per second.

Replication subscribers

Table 14–12 shows replication subscriber information.

Table 14–12 Replication Subscribers

Name	Description
Average latency time (in seconds)	The average latency time in seconds between when the master sends a message and when it receives the final acknowledgment from the subscriber.
Last message received	Time in seconds since this subscriber received the last message from the master.
Last message sent	Time in seconds since the master sent the last message to the subscriber. This includes the "heartbeat" messages sent between the databases.
Replication host name	Name of the system that hosts the subscriber.
Replication peer name	Name of the subscriber database.
Replication port number	TCP/IP port used by the subscriber agent to receive updates from the master. A value of 0 indicates that replication has automatically assigned the port.
Replication protocol	Protocol used by replication to communicate between master and subscribers.
Replication state	Current replication state of the subscriber peer in relation to the queried database.
Replication track	Replication track.
Txn log files held by the master database for a subscriber	Number of transaction log files the master database is retaining for a subscriber.

Replication tracks

Table 14–15 shows replication tracks information.

Table 14–13 Replication Tracks

Name	Description
Receiver batch commit counts	The total number of batch commits on the receiver.
Receiver batch commit time	The total time of batch commits on the receiver.
Receiver txn commit counts	The total number of commits on the receiver.
Receiver txn commit waits	The total number of commits waits on the receiver.

Table 14–13 (Cont.) Replication Tracks

Name	Description
Subscriber	The subscriber database.
Track	The track number.
Transmitter log waits	The log waits from the transmitter.

Replication state

Table 14–11 shows replication state information.

Table 14–14 Replication State

Name	Description
Cache grid State	The current state of the cache grid if the active standby pair is configured for cache grid. If cache grid is not configured the status is No Cache Grid.
State	The current replication state of the database in an active standby pair.

Response

Table 14–15 shows response information.

Table 14–15 Response

Name	Description
Status	Valid values are Up or Down.

SQL command cache

Table 14–16 describes information in the SQL command cache.

Table 14–16 SQL Command Cache

Name	Description
Command ID	The SQL command identifier.
Executions which took place on this command	The number of executions that took place on this command since it was brought into the command cache.
Fetch executions done internally for this statement	The number of fetch executions that were done internally for this statement.
Indicates if command can be garbage collected	Indicates whether this command can be garbage collected by the subdaemon. If 0, it is non-freeable. If 1, it is freeable.
Last measured execution time of the command	The last measured execution time for this SQL command.
Maximum execute time in seconds of this statement	The maximum execution time in seconds for this SQL command.
Minimum execute time in seconds	The minimum execution time in seconds for this SQL command.
Reprepares or invalidations of this command	A counter for the number of reprepares or invalidations of this command.
SQL for the current command	The full SQL text for the current command.

Table 14–16 (Cont.) SQL Command Cache

Name	Description
Space(bytes) allocated for this command in the command cache	The total space in bytes allocated for this command in the command cache.
Time when the statement started	The time of when the last execution of the SQL statement started.
Unique ID of a private connection	Unique identifier of a private connection.
User prepares which result in a hit on the command cache	A counter for the number of user prepares that result in a hit in the command cache.
User who created this command	The identifier of the user who created this command.

SQL execution time histogram

Table 14–18 shows SQL execution time histogram information.

Table 14–17 SQL Execution Time Histogram

Name	Description
Accumulated wall clock execution time(sec) when sampling	The accumulated wall clock execution time when sampling in seconds.
Execution Time(sec) upper bound for the bucket	The execution time upper bound limit for this bucket in seconds.
Execution time samples since database start or statistics reset	The number of execution time samples that have been taking since the database has started or since statistics were reset.
SQL command count in this bucket	The SQL command count in this bucket.

Transaction log holds

Table 14–18 shows transaction log holds information.

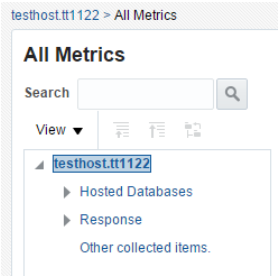
Table 14–18 Transaction Log Holds

Name	Description
Object for which the hold was created	The type specific object for which the hold was created.
Transaction log file number of the hold	The transaction log file number of the hold.
Transaction log file offset of the hold	The transaction log file offset of the hold.
Type of hold	The type of hold.

Viewing TimesTen instance metrics

There are two groups of TimesTen instance metrics:

Figure 14–4 TimesTen Instance All Metrics



- Hosted databases
- Response

Some metrics have predefined warning and critical thresholds. You can modify and add new thresholds. The Oracle Enterprise Manager Cloud Control issues alerts and warnings when the values collected for the metrics surpass the set threshold.

Hosted databases

Table 14–18 shows hosted databases information.

Table 14–19 Hosted Databases

Name	Description
Cache agent	This value can be either Up or Down. If you have not configured a cache group, then this value is Down.
Client server connections	The number of client/server connections to the database.
Database path name	The value is taken from the last part of the path to the database. For example, if the path to the database is `/var/tt/sampledb_1122`, the database name is `sampledb_1122`.
PL/SQL	This value can be either Enables or Disabled. Once PL/SQL support is enabled in a database, you cannot disable it later.
Ram status	This value can be either Loaded or Not loaded. The RAM status is Loaded if the database is loaded into memory.
Replication agent	This value can be either Up or Down. If you have not configured a replication scheme, then this value is Down.
Total connections	The total number of direct mode and client/server connections to the database.

Response

Table 14–18 shows response information.

Table 14–20 Response

Name	Description
Status	Valid values are Up or Down.

15

Viewing Target Topology

This chapter describes the TimesTen topology page. The topology page provides a visual layout of the relationships between Enterprise Manager targets and performance information about your targets.

Topics include:

- Viewing the topology page
- Changing the view of the topology page
- Adding monitoring metrics

Viewing the topology page

To view the topology page, ensure that you are on the TimesTen target page. For information on navigating to the TimesTen target page, see "Navigating to the TimesTen target page" on page 2-1.

Depending on the type of target there are two ways of accessing the topology page:

- For a TimesTen instance target:

  From the **TimesTen Instance Home** menu, select **Configuration**, then select **Topology**.

- For a TimesTen database target:

  From the **TimesTen Database Home** menu, select **Configuration**, then select **Topology**.

Changing the view of the topology page

The topology page provides a visual layout of the relationships between Enterprise Manager targets and performance information about your targets.

To change the view of the topology page:

1. From the **View** drop-down list, select a view type:

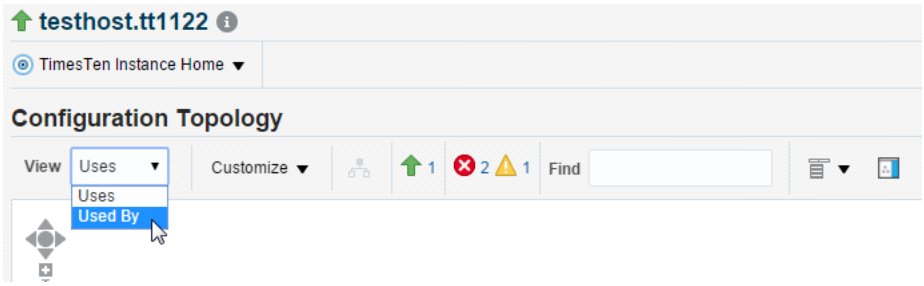
- Uses

  This view helps you determine the targets that the selected target depends on. If a target is having problems, this view can be useful in helping you determine whether its problems have been caused by another target it depends on. This is the default view.

- Used by

This view shows you the targets that depend on the selected target. This can be useful, for example, to view a certain TimesTen metric for the TimesTen databases that are associated with a specific TimesTen instance.

Figure 15–1 Select view



The topology page refreshes with your selected view type.

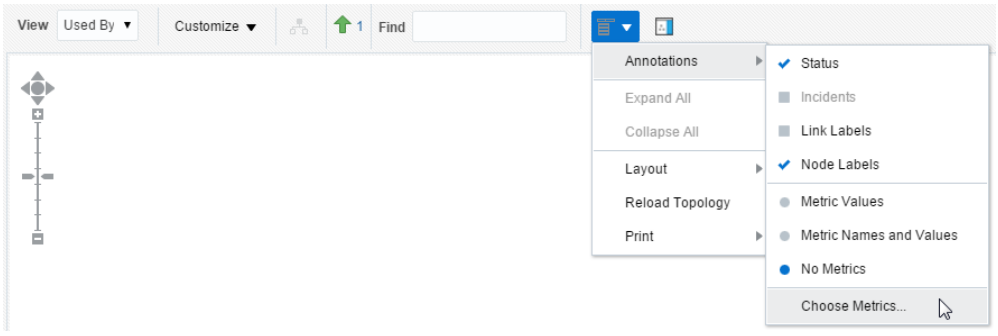
Adding monitoring metrics

The topology page enables you to view monitoring metrics for your Enterprise Manager targets on a single page. For example, you can monitor the `PermSize` and `TempSize` attributes of all of the TimesTen databases that are associated with your TimesTen instance.

To add monitoring metrics to the targets displayed on the topology page, ensure that you are on the topology page for your TimesTen target.

1. From the **Options** menu, select **Annotations**, then select **Choose Metrics**.

Figure 15–2 Select Choose Metrics



The Choose Metrics dialog displays. Locate the * Target Type drop-down list.

2. From the * **Target Type** drop-down list, select a target type:

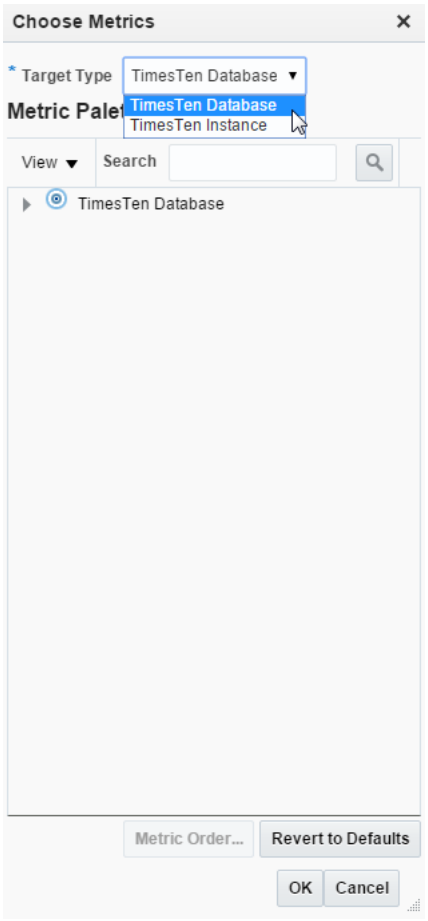
   - TimesTen Database

     This target type lets you choose metrics that are specific for TimesTen database targets. For more information on TimesTen database metrics, see "Viewing TimesTen database metrics" on page 14-3.

   - TimesTen Instance

     This target type lets you choose metrics that are specific for TimesTen instance targets. For more information on TimesTen instance metrics, see "Viewing TimesTen instance metrics" on page 14-24.

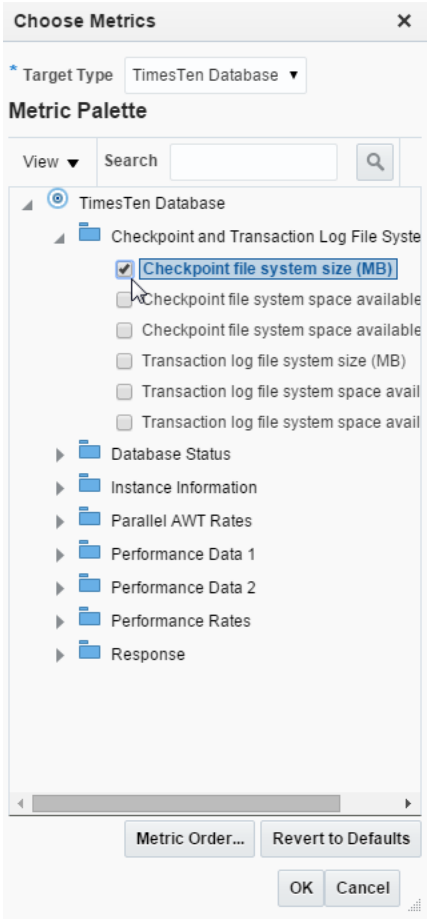
Figure 15–3 Select the target type



Locate the name of the metric group.

3. Expand the metric group, and click the **name of the metric**.

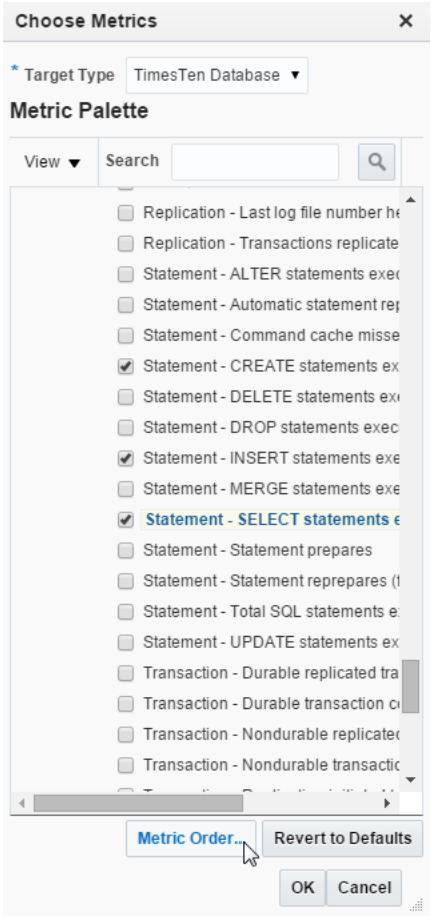
Figure 15–4 Choose Metrics dialog



Repeat this step until you add all of the metrics that you want to monitor. Locate the Metric Order button.

4. Click **Metric Order**.

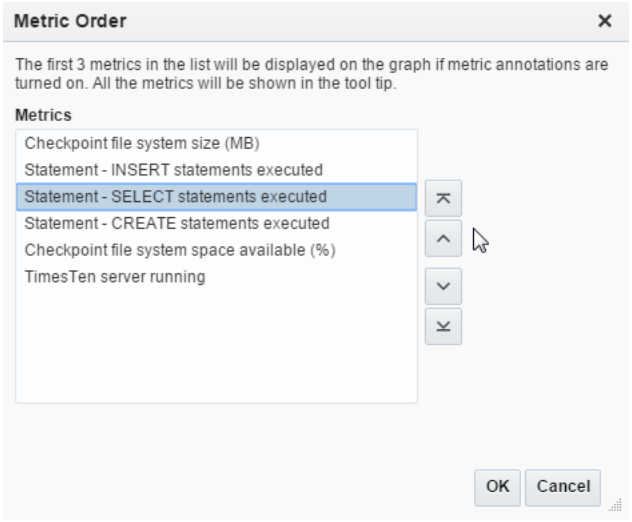
Figure 15–5 Click Choose Metric



The Metric Order dialog displays. The first three metrics in the list are displayed for each of your Enterprise Manager target on the topology page. Additional metrics are displayed in the tooltip of the Enterprise Manager target.

5. Organize the metrics with the arrows that are on the right of the metric list.

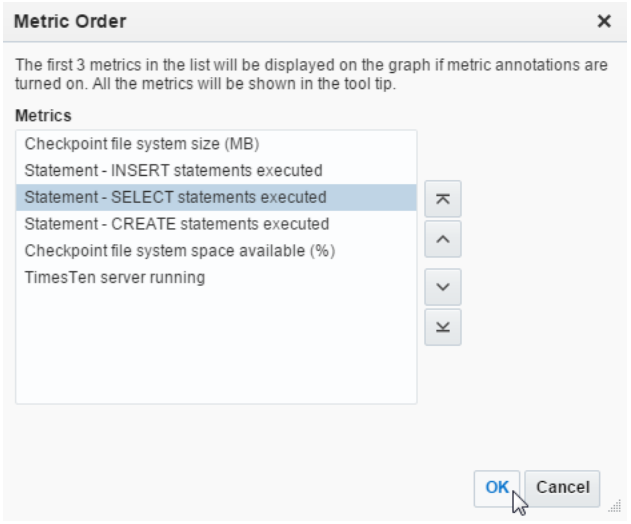
Figure 15–6 Organize the metrics



Locate the OK button.

6. Click **OK**.

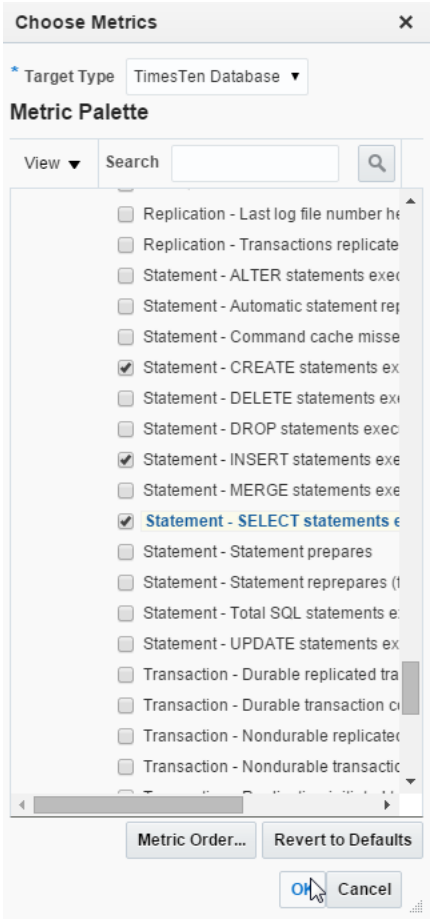
Figure 15–7 Click OK



The Metric Order dialog closes. Locate the OK button in the Choose Metrics dialog.

7. Click **OK**.

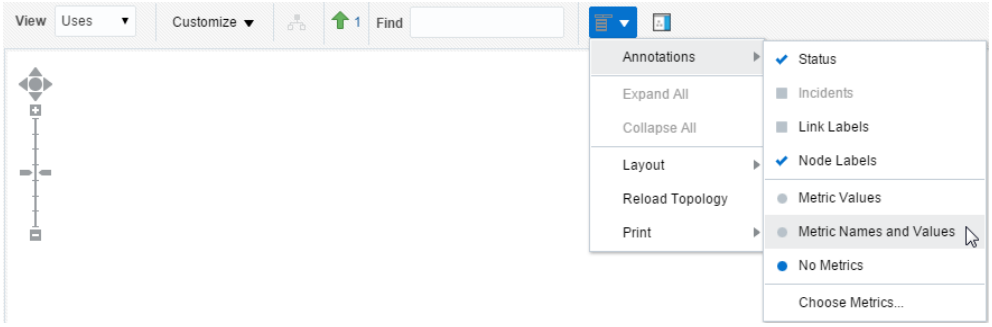
Figure 15–8 Click OK



The Choose Metrics dialog closes. Locate the Options button on the topology page.

8. From the **Options** menu, select **Annotations**, then select **Metric Names and Values**.

Figure 15–9 Select Metric Names and Values



The Topology page refreshes.

Your targets now show the top three metrics that you configured. Hover over a target and click the **more** link in the popup to see all of your configured metrics for a specific target.

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