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System Monitoring Plug-in for Oracle TimesTen In-Memory Database User's Guide

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Oracle Enterprise Manager System Monitoring Plug-in for Oracle TimesTen In-Memory Database User's Guide Release 12.1.0.2.0

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Preface

The Oracle Enterprise Manager System Monitoring Plug-in for Oracle TimesTen In-Memory Database (IMDB) 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 on the product distribution media and on the Oracle Technology Network (OTN):

http://www.oracle.com/technetwork/database/database-technologies/timesten/documentation/index.html

Oracle Database documentation is also available on the Oracle Technology network. This may be especially useful for Oracle Database features that TimesTen supports but does not attempt to fully document.

http://www.oracle.com/pls/db121/homepage/

Conventions

TimesTen supports multiple platforms. The term Windows refers to all supported Windows platforms and the term UNIX applies to all supported UNIX platforms and also to Linux. 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 Oracle Enterprise Manager System Monitoring 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.

Convention	Meaning
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 variable in a code example that you must replace. For example: `Driver=`*`install_dir`*`/lib/libtten.sl` Replace *`install_dir`* with the path of your TimesTen installation 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.
%	The percent sign indicates the UNIX shell prompt.
#	The number (or pound) sign indicates the UNIX root prompt.

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

Convention	Meaning
`install_dir`	The path that represents the directory where the current release of TimesTen is installed.
`TTinstance`	The instance name for your specific installation of TimesTen. Each installation of TimesTen must be identified at install time with a unique alphanumeric instance name. This name appears in the install path.
`bits` or *`bb`*	Two digits, either 32 or 64, that represent either the 32-bit or 64-bit operating system.
`DSN`	The data source name.

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1

Installing the System Monitoring Plug-in for TimesTen

The System Monitoring 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 System Monitoring Plug-in for TimesTen
- Verifying and validating the plug-in
- Setting preferred credentials for a target
- Changing the monitoring configuration of a target
- Uninstalling the System Monitoring Plug-in for TimesTen

Note: The instructions and screenshots of this user's guide are based on Oracle Enterprise Manager Cloud Control 12*c* Release 3.

Installation prerequisites

Before installing the System Monitoring Plug-In for TimesTen:

- Install Oracle Enterprise Manager Cloud Control 12*c* Release 2 (or higher) for OMS, Enterprise Manager Repository, and Agent. Make sure the agent can successfully communicate with your Oracle Enterprise Manager Server and can upload data.
- Install Oracle TimesTen In-Memory Database Release 11.2.1.8 (or later) or 11.2.2.1 (or later).

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

When you configure your TimesTen 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 MS Windows.

- The TimesTen database username and password
  - The username 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.

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

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 System Monitoring 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 Management Agents" 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, make sure the user has read access to `/etc/TimesTen/instance_info`. For more information about the TimesTen users group, see "Create the TimesTen users group" in the *Oracle TimesTen In-Memory Database Installation Guide*.
- For optimal performance, make sure TimesTen is on a different machine than the Oracle Enterprise Management Service (OMS) and the Enterprise Manager Repository.
- Make sure 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 Lifecycle Management Administrator's Guide*.
- Make sure 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 System Monitoring Plug-in for TimesTen

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

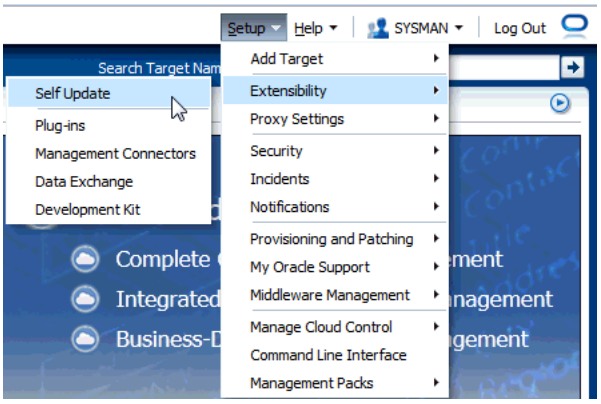
- Download the plug-in
- Deploy the plug-in on OMS
- Deploy the plug-In on the Management Agent
- Configure a TimesTen target

Download the plug-in

To download the plug-in, make sure 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**.

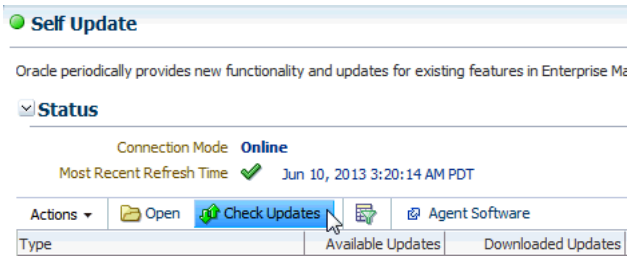
Figure 1–1 Select Self Update



The Self Update page displays.

2. Click **Check Updates**.

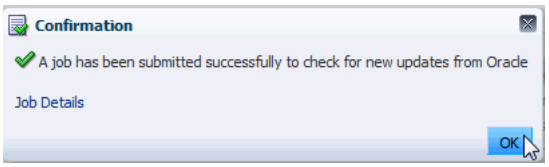
Figure 1–2 Click Check Updates



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**.

Figure 1–3 Checking for updates

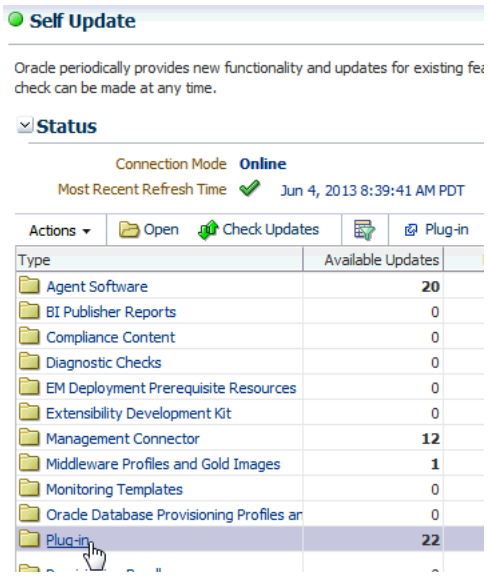


The Self Update page displays with a Most Recent Refresh Time status indicating the status of the updates.

- If you see a green 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 Manger 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 green check mark next to the Most Recent Refresh Time status, locate the Plug-in folder.

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

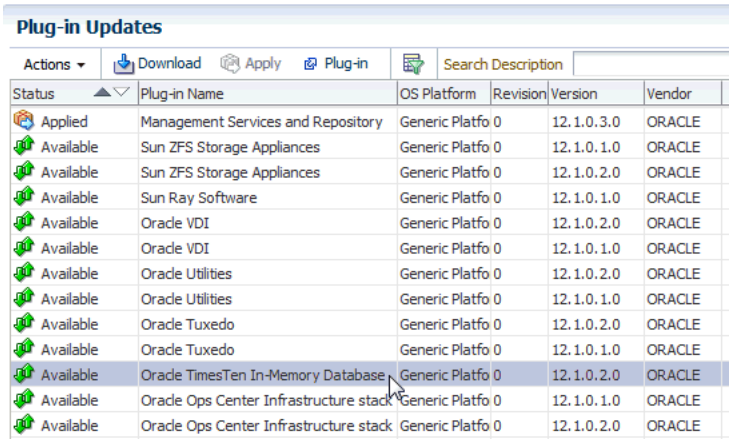
Figure 1–4 Plug-in folder



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**.

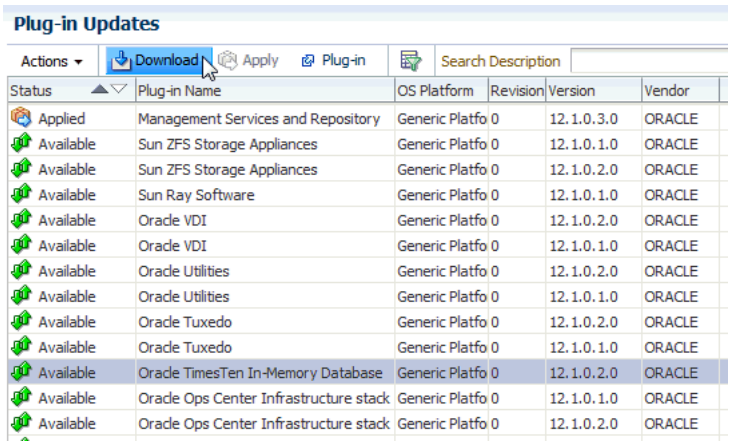
Figure 1–5 Plug-in Updates



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

6. Click **Download**.

Figure 1–6 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.

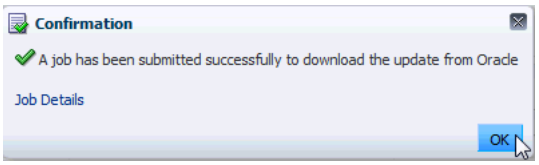
7. Click **Select**.

Figure 1–7 Schedule Download dialog

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

8. Click **OK**.

Figure 1–8 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 Server.

Deploy the plug-in on OMS

You must deploy the plug-in on both the Oracle Management Server (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.

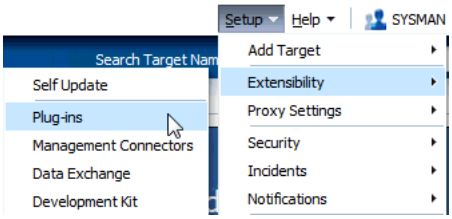
You must deploy the plug-in on OMS before deploying the plug-in on one or more Management Agents.

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, make sure 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**.

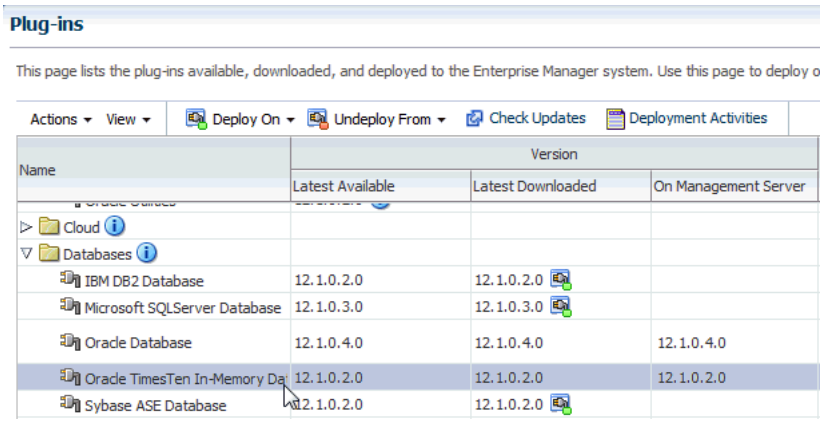
Figure 1–9 Choose Extensibility, then Plug-ins



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**.

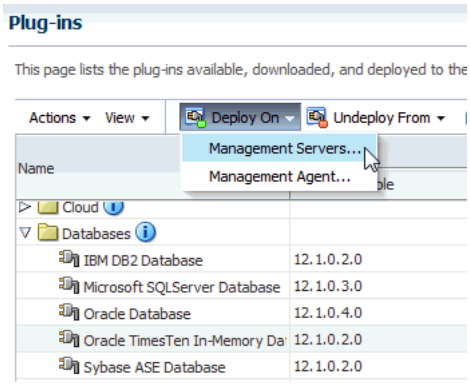
Figure 1–10 Choose TimesTen In-Memory Database plug-in



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...**.

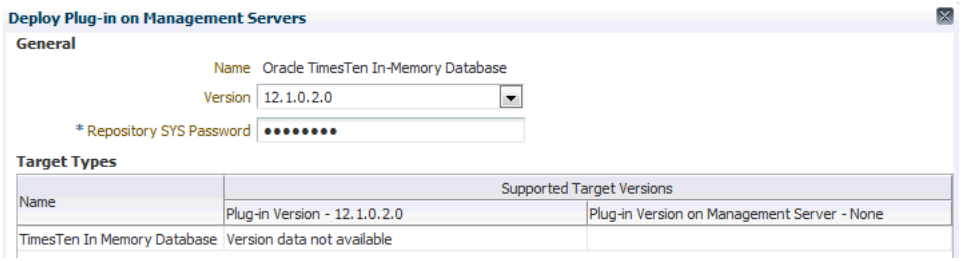
Figure 1–11 Deploy on OMS



The Deploy Plug-in on Management Servers General page displays. The plug-in **Oracle TimesTen In-Memory Database** is displayed in the Name column and the Version is auto-filled. Prepare to enter the Repository `SYS` user password.

4. In the ***Repository SYS Password** field, enter the Repository `SYS` user password.

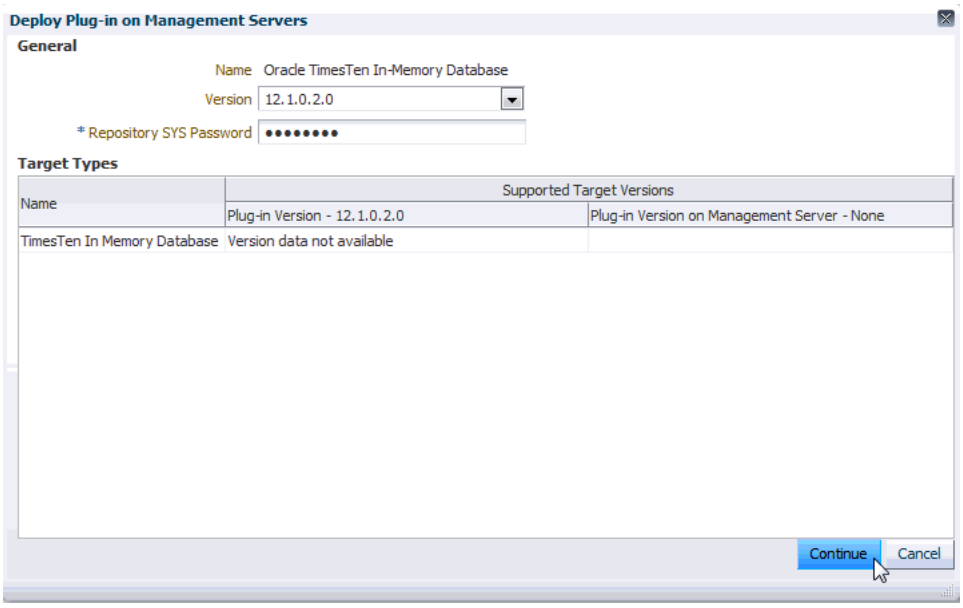
Figure 1–12 Repository SYS Password



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

5. Click **Continue**.

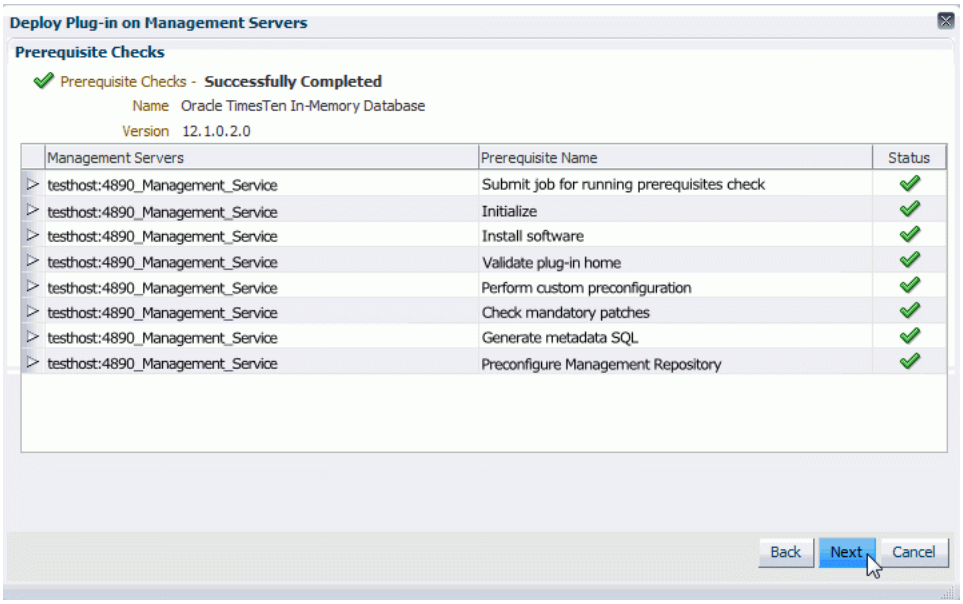
Figure 1–13 Click Continue



The Deploy Plug-in on Management Servers Prerequisite Checks page displays. You should see a check to the left of the Prerequisite Checks column. To the right of this column, you should see the text "Successfully Completed." In the Management Servers table, all rows should have a check in the Status column. Make sure all these conditions are met.

6. Click **Next**.

Figure 1–14 Prerequisite checks successful

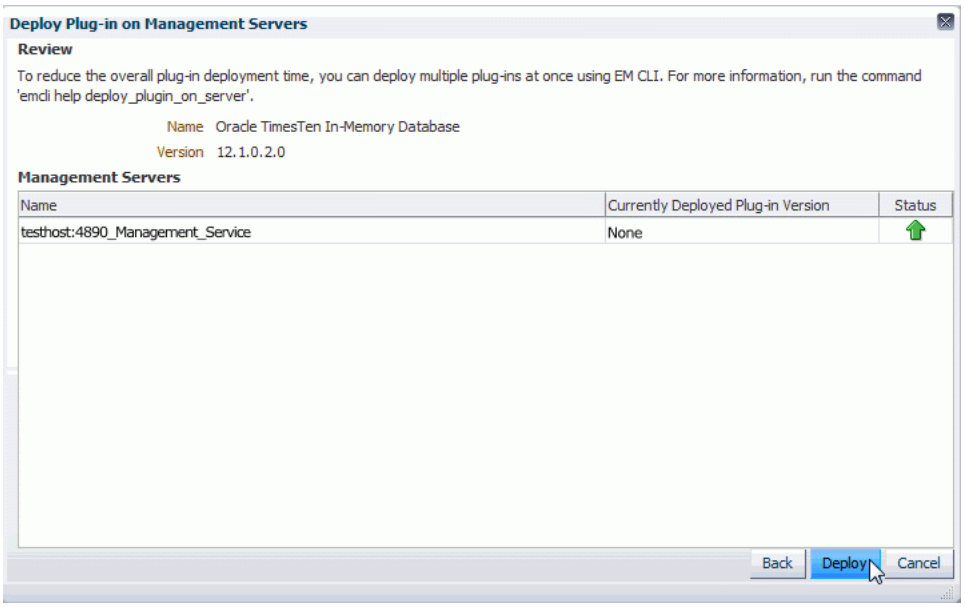


The Deploy Plug-in on Management Servers Review page displays. In the name column, verify the plug-in name is **Oracle TimesTen In-Memory Database**. Verify the version is correct.

You are ready to deploy the plug-in.

7. Click **Deploy**.

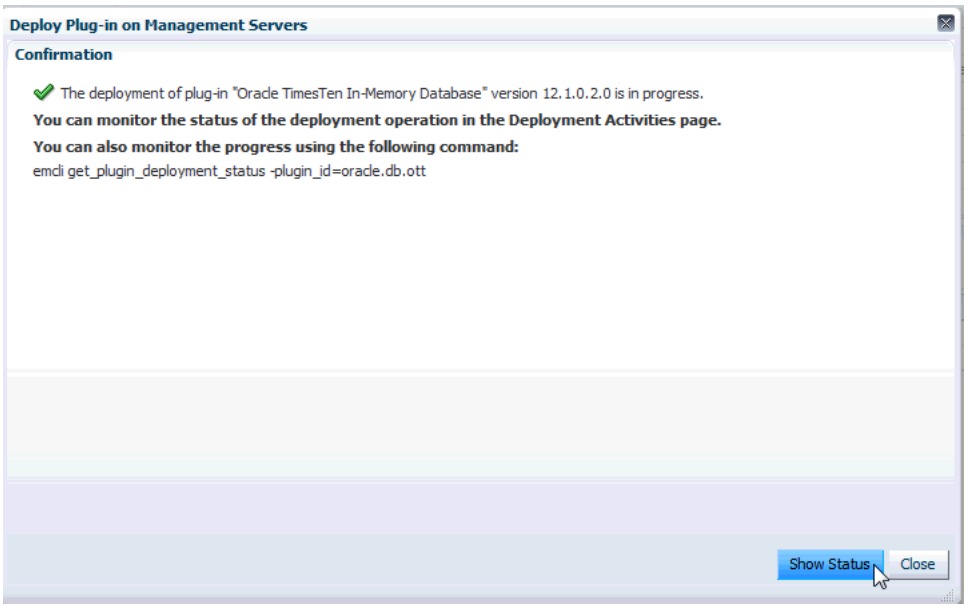
Figure 1–15 Review of the deploy on OMS



The Deploy Plug-in 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 may monitor the deployment status by clicking Show Status or going to the Recent Deployment Activities page.

8. Click **Show Status**.

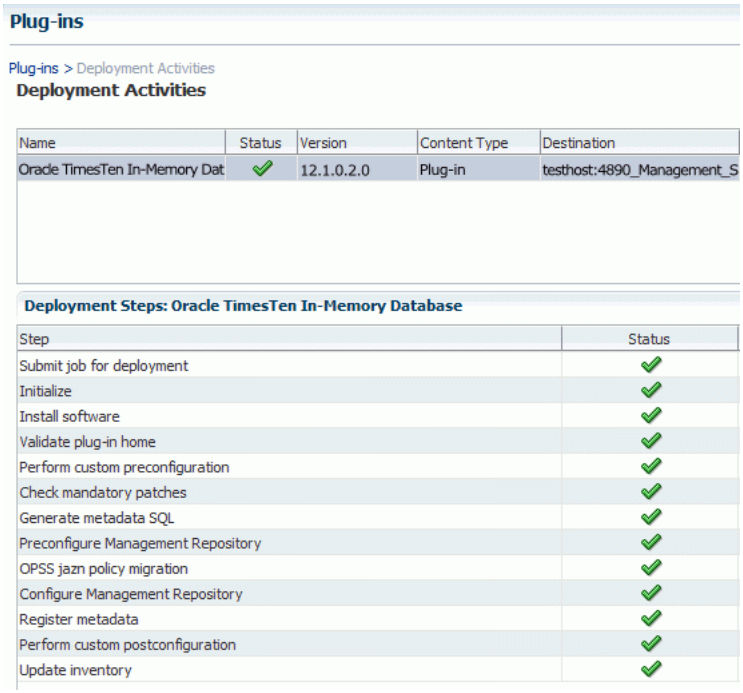
Figure 1–16 Confirmation of the deployment to OMS



The Plug-ins Deployment Activities page displays showing the status of the deployment steps in table format. The last step located in the last row of the table is named "Update inventory." Once this step is completed, make sure 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. Also, make sure there is a green check in the Status column in the deployment table located at the top of the page. If auto refresh is set to off, you may want to set autorefresh to 15 seconds, so you can see the steps as they are completed.

Figure 1–17 Deployment to OMS successful



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

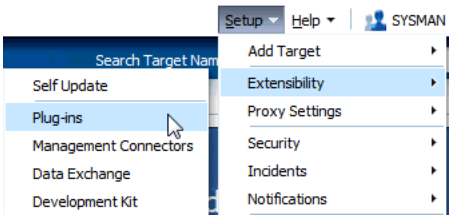
You must deploy the plug-in on OMS before deploying the plug-in on one or more Management Agents.

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

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

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

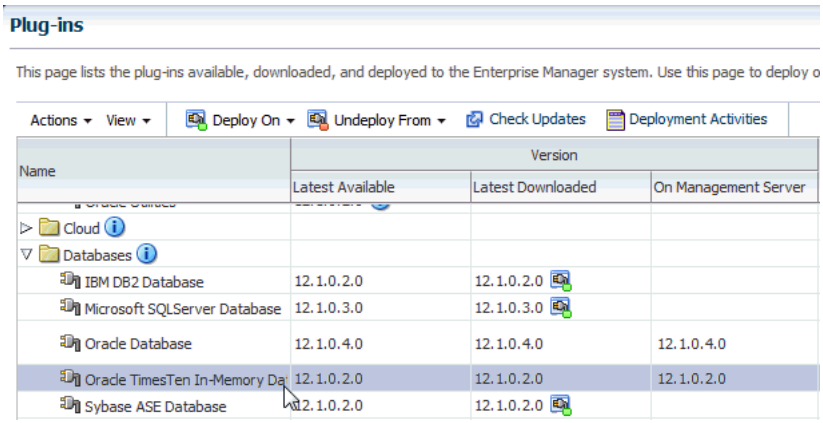
Figure 1–18 Choose Extensibility, then Plug-ins



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**.

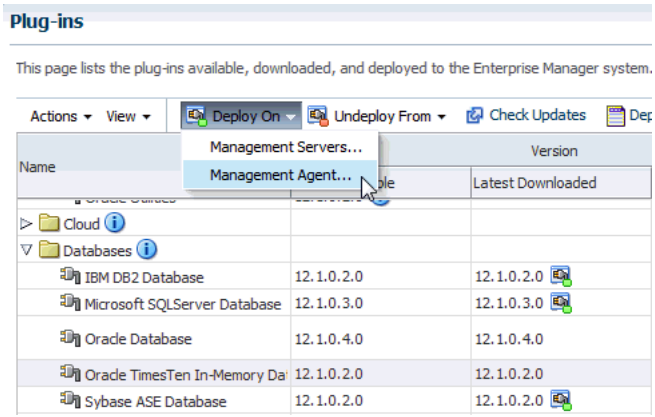
Figure 1–19 Choose Oracle TimesTen In-Memory Database plug-in



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...**.

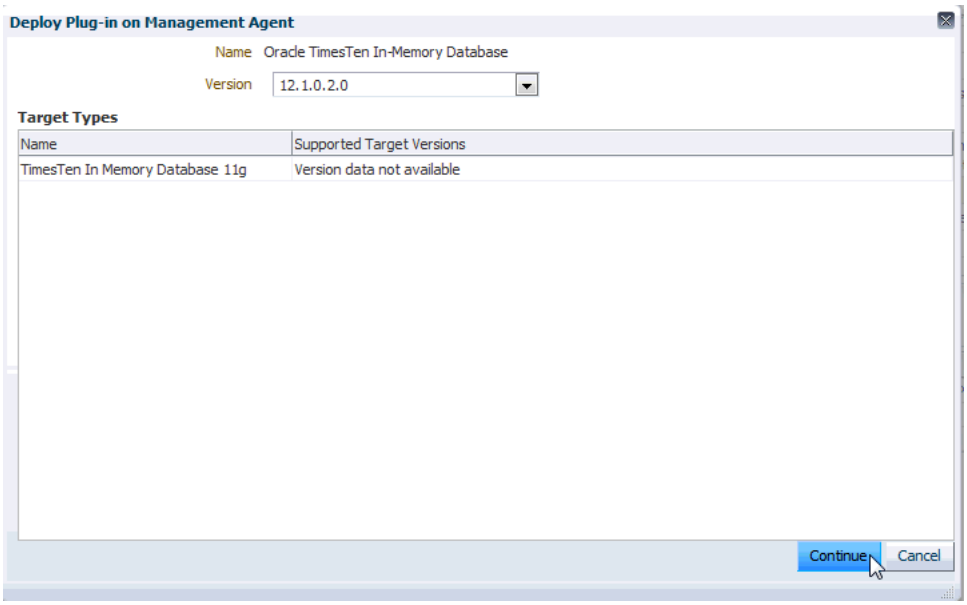
Figure 1–20 Deploy on Management Agent



The Deploy Plug-in on Management Agent General page displays. The plug-in **Oracle TimesTen In-Memory Database 11g** is displayed in the Name column and the Version is auto-filled. Locate the Continue button below the Target Types table.

4. Click **Continue**.

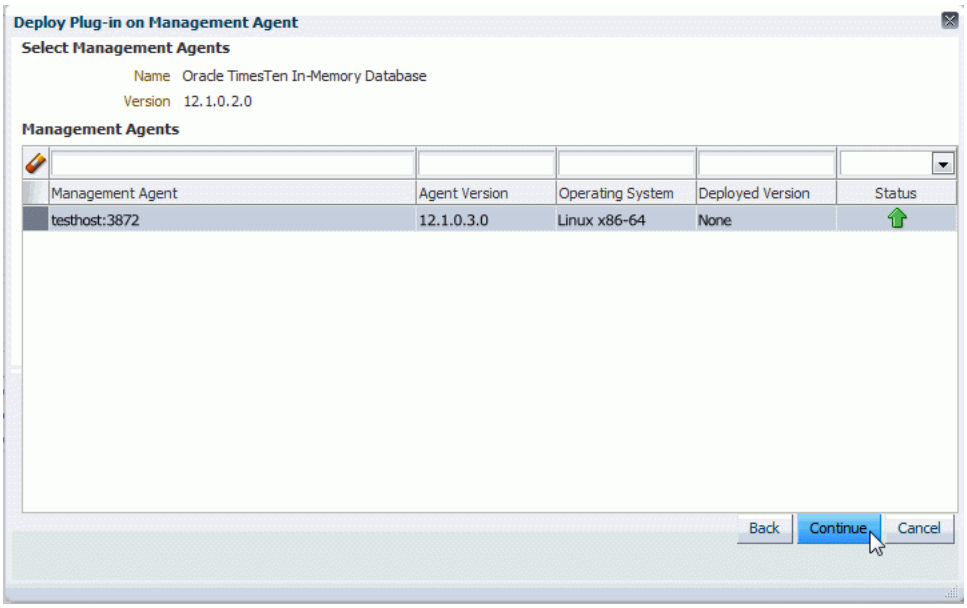
Figure 1–21 Click Continue



You can now choose the agent where you wish to deploy the plug-in. Note that 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**.

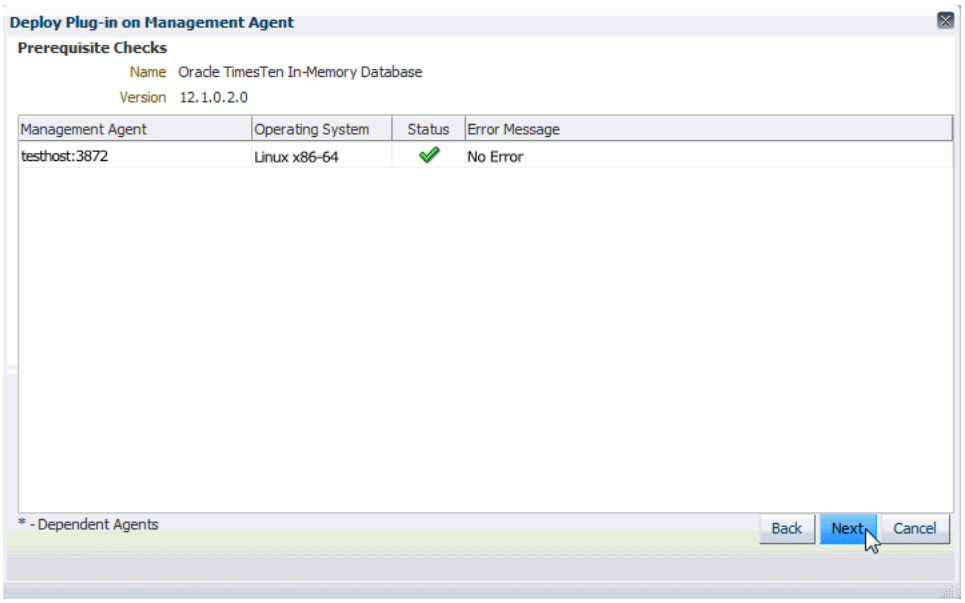
Figure 1–22 Choose agent and click Continue



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

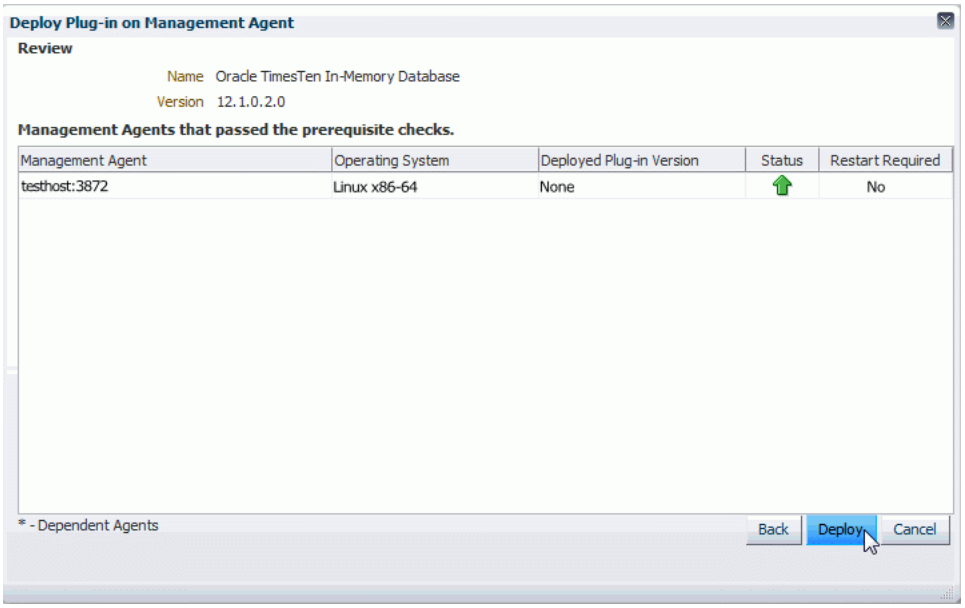


The Deploy Plug-in on Management Agent Review page displays. In the name column, verify the plug-in name is **Oracle TimesTen In-Memory Database** and the version is correct. Make sure that you see the text "Management Agents that passed the prerequisite checks" and make sure the Management Agent is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

You are ready to deploy the plug-in.

7. Click **Deploy**.

Figure 1–24 Click Deploy

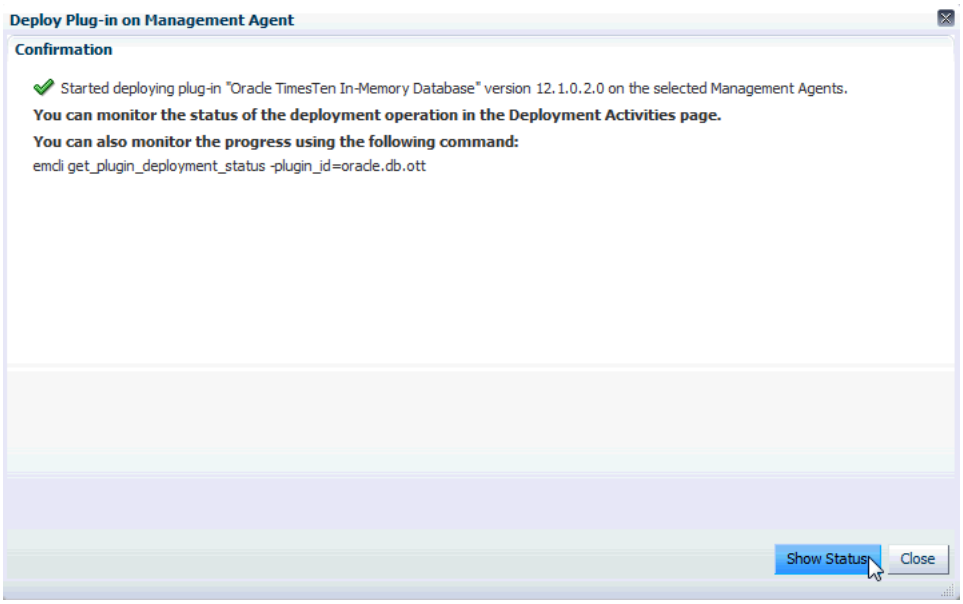


The Deploy Plug-in on Management Agent Confirmation page displays with a message indicating the deployment of the plug-in has started on selected agents.

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

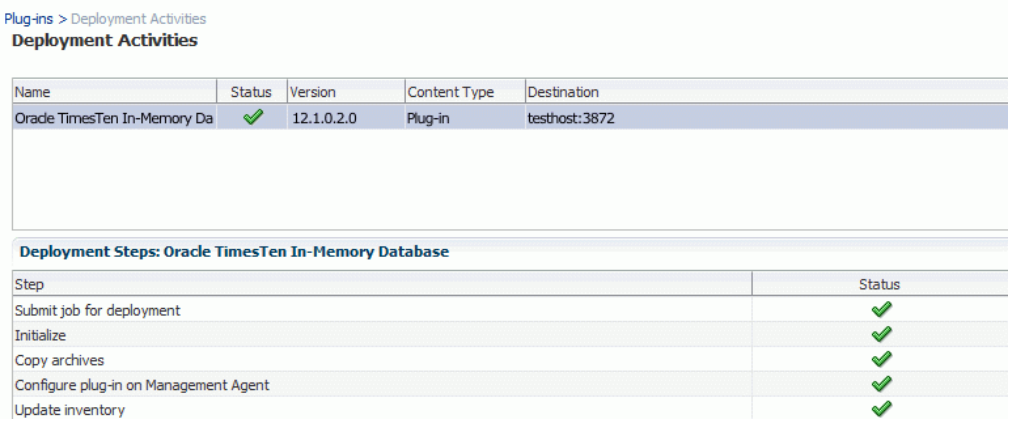
8. Click **Show Status**.

Figure 1–25 Confirmation dialog



The Plug-ins Deployment Activities page displays showing the status of the deployment steps in table format. The last step located in the last row of the table is named "Update inventory." Once this step is completed, make sure 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. Also, make sure there is a green check in the Status column in the Deployment table located at the top of the page. If auto refresh is set to off, you may want to set autorefresh to 15 seconds, so you can see the steps as they are completed.

Figure 1–26 Deployment of agent successful



The plug-in is deployed on the Management Agent. Repeat Steps 1-9 to deploy the plug-in on additional Management Agents.

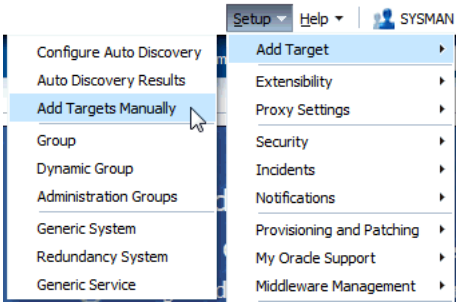
You are now ready to create a TimesTen target.

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 each unique DSN. When you configure your TimesTen target, use a Data Manager DSN. Client/server DSNs are not supported.

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

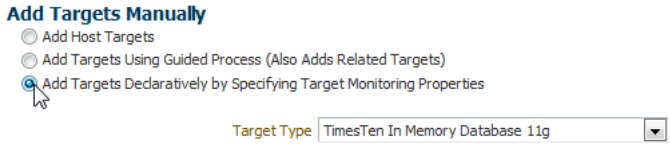
Figure 1–27 Add target manually



The Add Targets Manually page displays. Locate Add Targets Manually in the middle left section of the page.

2. Click in the circle to the left of the text **Add Targets Declaratively by Specifying Target Monitoring Properties**.

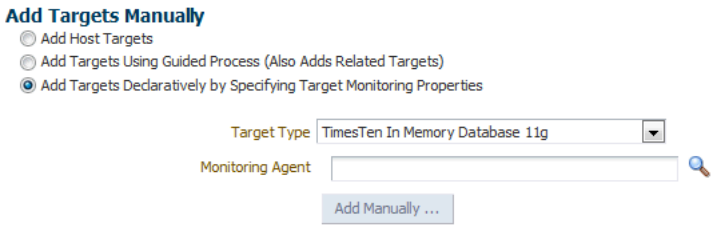
Figure 1–28 Add Non-Host Targets



The Target Type select list displays. You are now ready to select TimesTen In-Memory Database 11*g*.

3. Expand the drop-down list labeled **Target Type** and select **TimesTen In Memory Database 11g**.

Figure 1–29 Choose target type



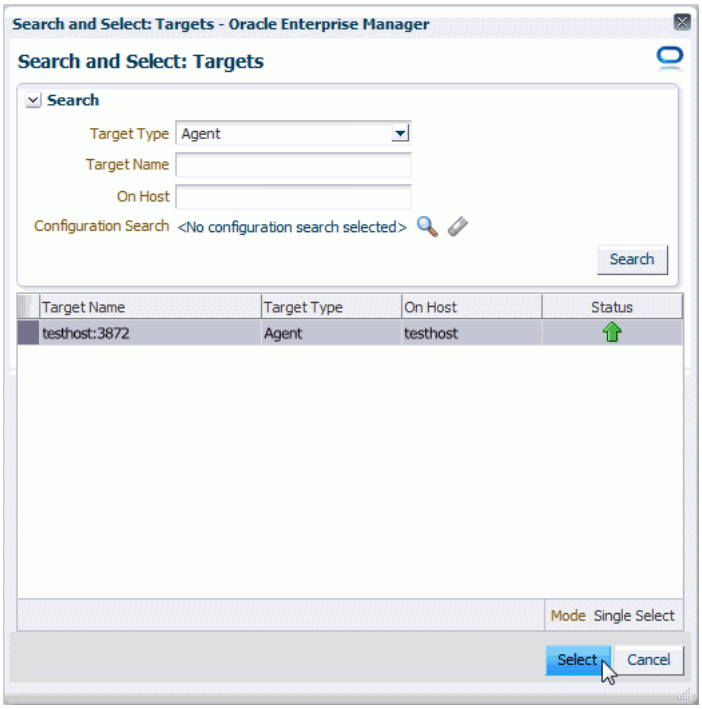
You are now ready to search for the Monitoring Agent. Locate the Monitoring Agent search box below the Target Type select list.

4. Click the **Search** icon located to the right of Monitoring Agent.

The Search and Select Targets - Oracle Enterprise Manager page displays. You are now ready to choose the monitoring agent for your TimesTen target. Locate the Targets table with columns Target Name, Target Type, and On Host. Identify the Target Name of your agent. Make sure the Target Type is Agent and double check the On Host column to make sure the host name is correct.

5. Click in the row that identifies the **Target Name** of your agent and click **Select**.

Figure 1–30 Select Management Agent

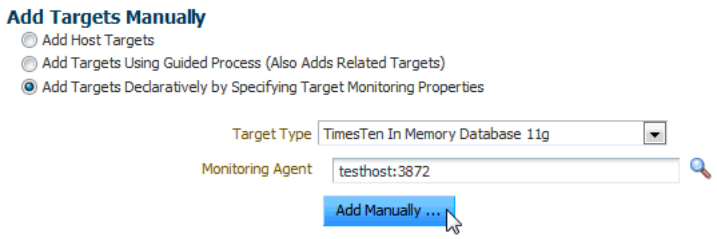


The Search and Select Targets - Oracle Enterprise Manager page closes and you are returned back to the Add Targets Manually page. Notice the agent you selected is auto-filled in the Monitoring Agent text field. Double check the Target Type is **TimesTen In Memory Database 11g** and the agent is correct.

You are now ready to add the target.

6. Click **Add Manually...**

Figure 1–31 Click Add Manually



The Add TimesTen In Memory Database 11*g* 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. Choose a name that is a meaningful identifier. (For example, *`hostname.instance.DSN`*.)

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

   Notice the Target Type, 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.

8. 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.

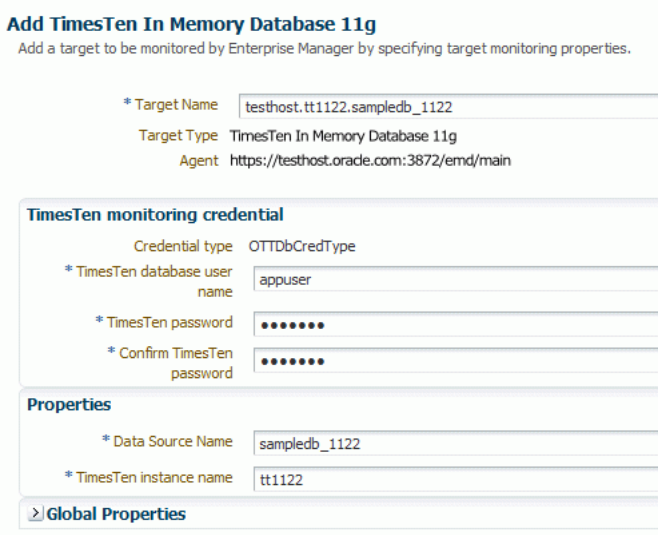
9. In the ***TimesTen password** text field, type the password for the TimesTen database user who has `ADMIN` privileges. Note: This user cannot be the TimesTen instance administrator.

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

11. 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 MS Windows.

12. 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*.)

Figure 1–32 Add TimesTen specific information



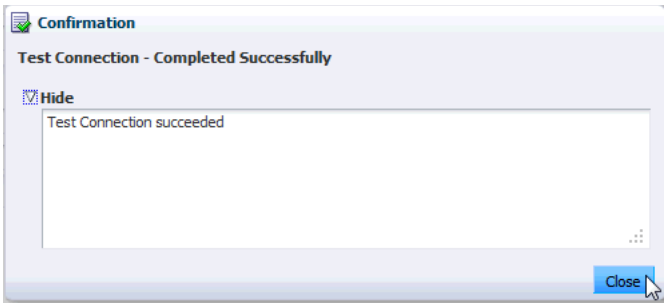
You are now ready to test your connection to make sure that your target is deployed successfully and configured properly.

13. Click **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, make sure your instance name and DSN are correct and the TimesTen database for the DSN is loaded into memory.

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

Figure 1–33 Test Connection successful



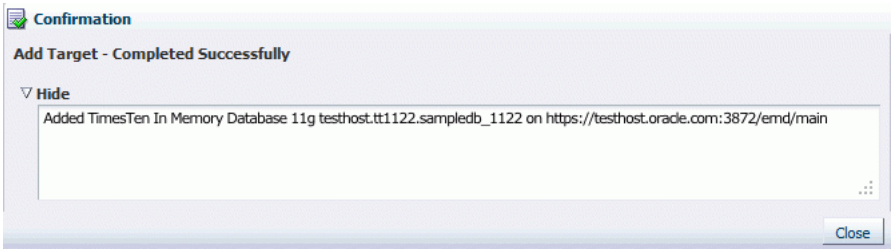
The Confirmation dialog closes. Locate the OK tab at the top right of the page.

15. Click **OK**.

    A second Confirmation dialog displays. You should see the informational message "Add Target - Completed Successfully." The target type (**TimesTen In Memory Database 11g**), Target name, and Agent are also displayed.

16. Click **Close**.

Figure 1–34 Target added successfully



Your target has been successfully added.

You can now verify and view information about your new target.

Verifying and validating the plug-in

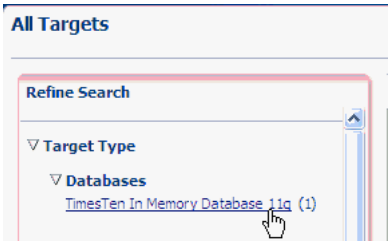
After waiting a few minutes for the plug-in to start collecting data:

1. From the **Targets** menu, select **All Targets** on the Enterprise Manager Cloud Control 12*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 In Memory Database 11g**.

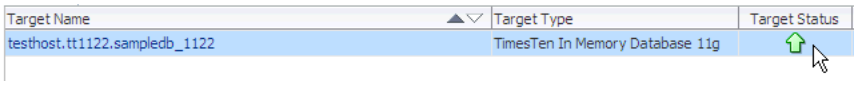
Figure 1–35 Choose TimesTen In Memory Database 11g



The target table displays. For each row in the table, confirm the column Target Type contains **TimesTen In Memory Database 11g** 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 1-15.

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

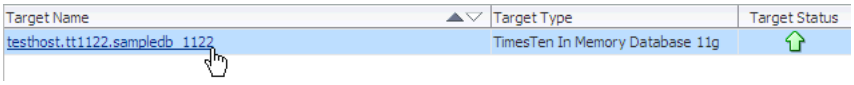
Figure 1–36 Verify the TimesTen target is Up.



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).

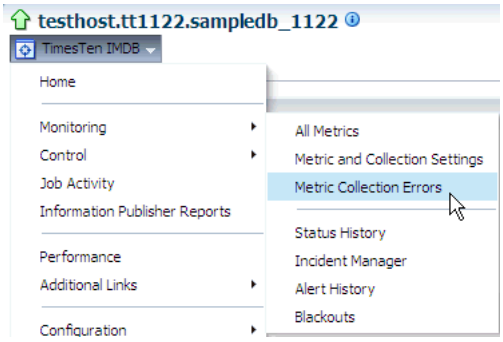
Figure 1–37 Click the target name



The TimesTen target page displays.

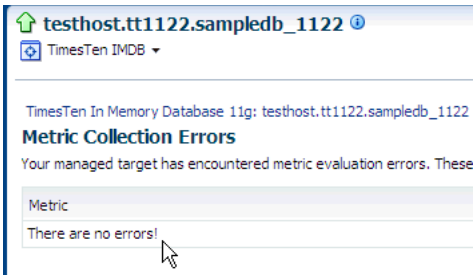
4. From the **TimesTen IMDB** menu, select **Monitoring**, then select **Metric Collection Errors**.

Figure 1–38 Choose 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 1–39 No errors



You are now ready to verify the TimesTen reports.

5. From the **TimesTen IMDB** menu, select **Information Publisher Reports**.

   The Information Publisher Reports page displays.

6. Select a **TimesTen** report. For example, choose **TimesTen IMDB Connections Reports**.

   Verify the report displays and there are no errors. For information on reports, see "Viewing reports" on page 8-1.

Setting preferred credentials for a target

In order to use the transaction monitor, you must set preferred credentials for your TimesTen target. For more information on the transaction monitor, see "Transaction monitor" on page 4-10.

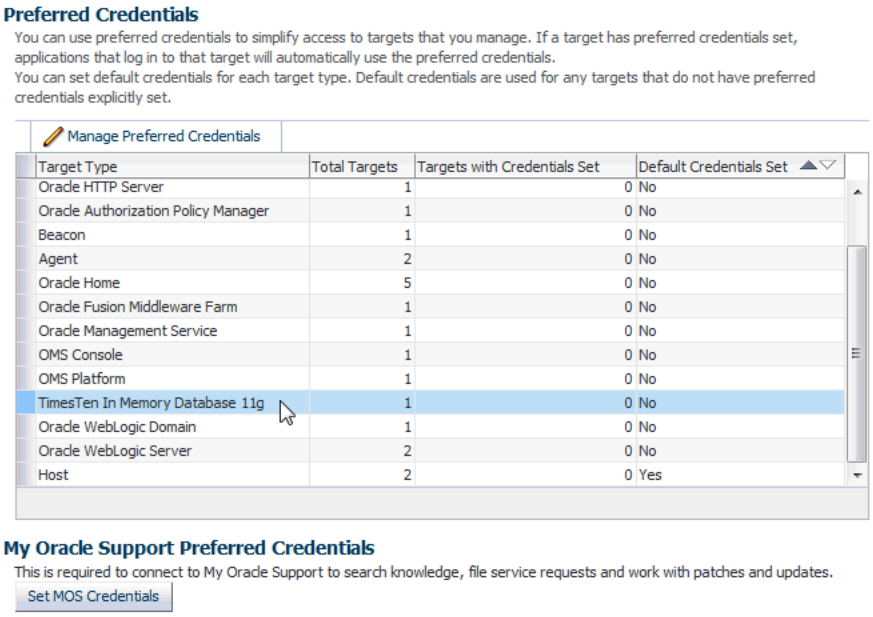
To set the preferred credentials for a target:

1. Make sure you are on the Enterprise Manager Cloud Control 12*c* home page. From the **Setup** menu, select **Security**, then select **Preferred Credentials**.

   The Preferred Credentials page displays. Locate TimesTen In Memory Database 11*g* in the Target Type column.

2. Click **TimesTen In Memory Database 11g**.

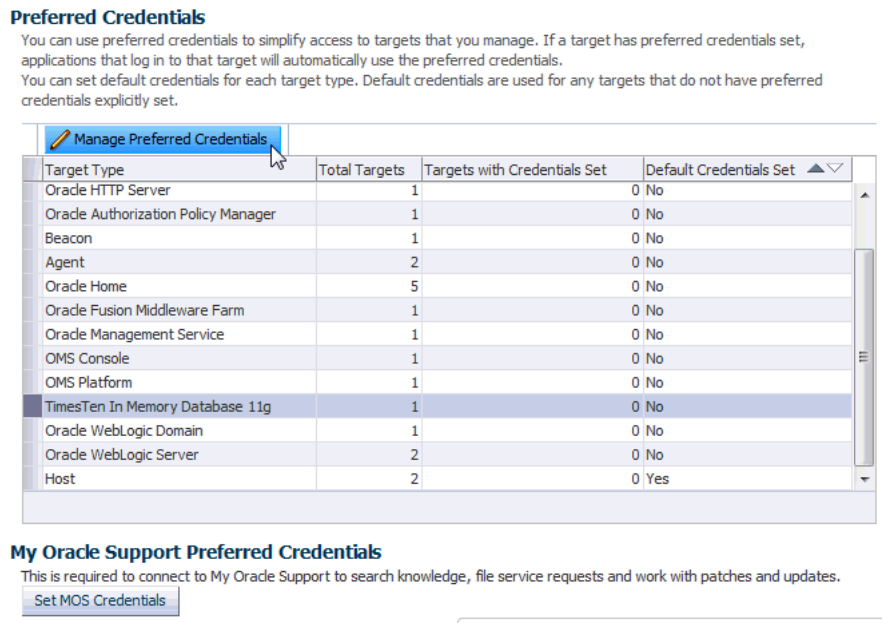
Figure 1–40 Preferred Credentials Page



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

3. Click **Manage Preferred Credentials**.

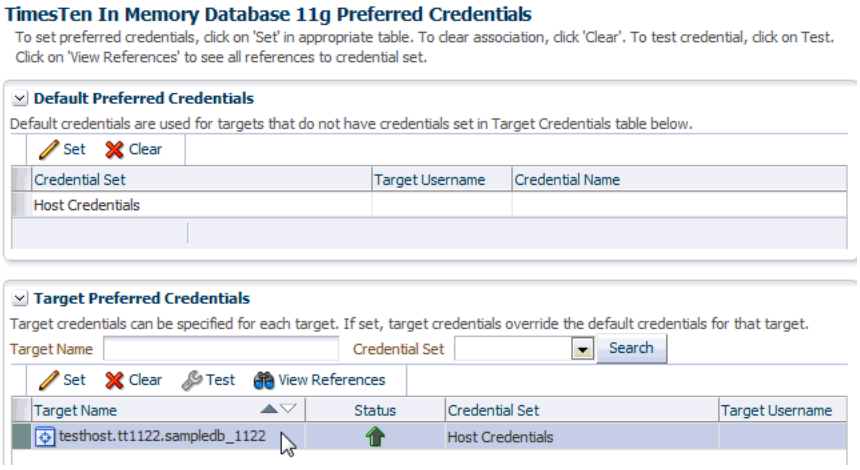
Figure 1–41 Click Manage Preferred Credentials



The TimesTen In Memory Database 11*g* Preferred Credentials page displays.

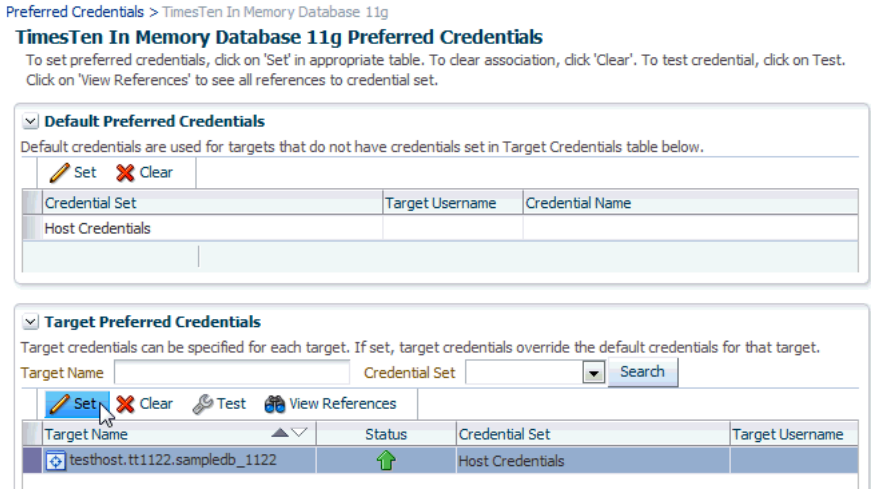
4. In the Target Preferred Credentials table, locate the row that contains your TimesTen target. In the column Target Name, click the **Target Name**. (The target name is the name of the TimesTen target you configured.)

Figure 1–42 Click the target name



5. Click **Set**.

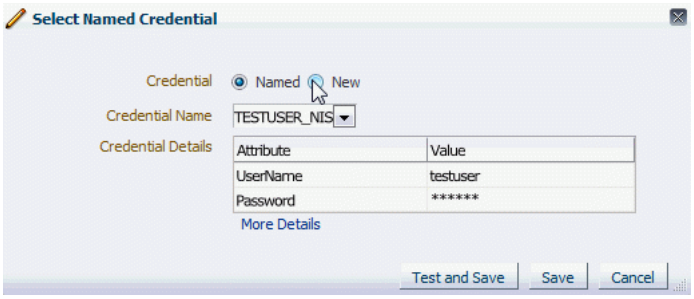
Figure 1–43 Click set



The Select Named Credentials page displays.

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

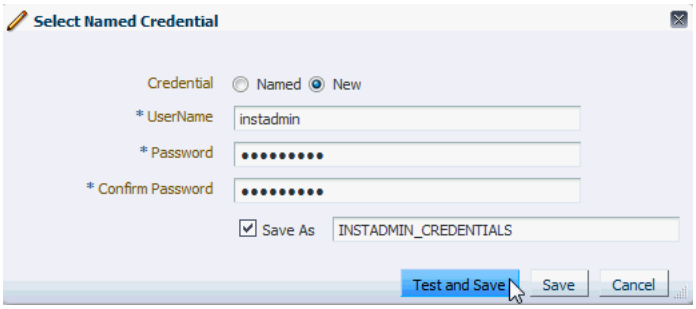
Figure 1–44 Select Named Credential page



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

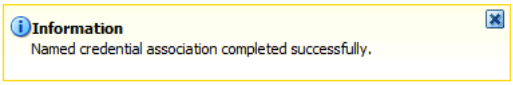
7. In the ***UserName** text field, type the user who has access to the target host. The username must be the Operating System username of the TimesTen instance administrator.
8. In the ***Password** text field, type the password for the user who has access to the target host. The password must be the 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 wish to use for the preferred credentials. The credentials are saved with this name.
12. Click **Test and Save**.

Figure 1–45 Click Test and Save



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

Figure 1–46 Successful named credential association



You have successfully associated the credential with your TimesTen target.

Changing the monitoring configuration of a target

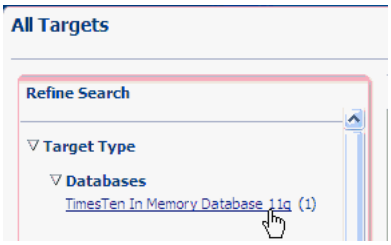
When you configure your TimesTen target, you specify the TimesTen username and password. If you change the password for this TimesTen user in the TimesTen database, you must update the password in the Enterprise Manager Cloud Control monitoring configuration. For more information on configuring your TimesTen target, see "Configure a TimesTen target" on page 1-15.

To change the monitoring configuration of your TimesTen target:

1. From the **Targets** menu, select **All Targets** on the Enterprise Manager Cloud Control 12*c* home page.

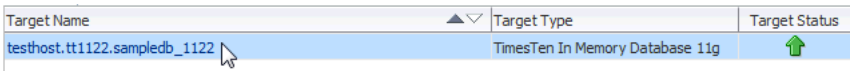
   The All Targets page displays. Locate the Refine Search panel under **All Targets**.
2. Expand **Target Type**, then **Databases** and click **TimesTen In Memory Database 11g**.

Figure 1–47 Choose TimesTen In Memory Database 11g



Locate the row that contains the target name.

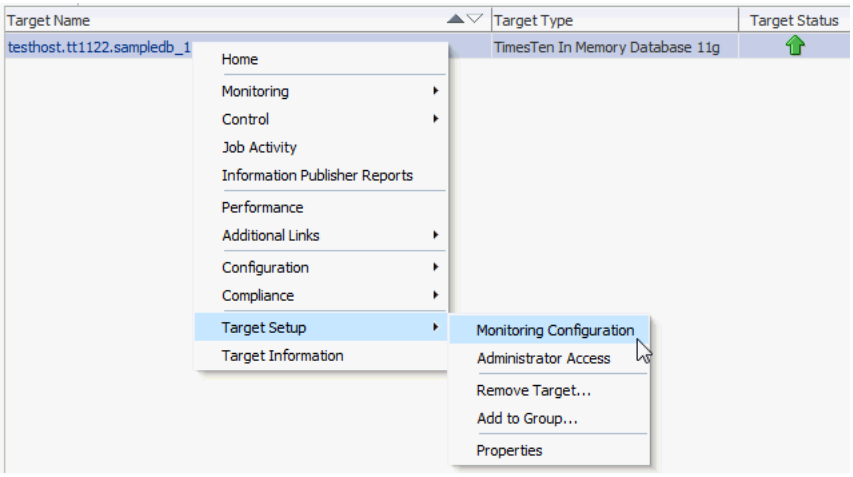
Figure 1–48 Locate the TimesTen target



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 1–49 Change the monitoring configuration

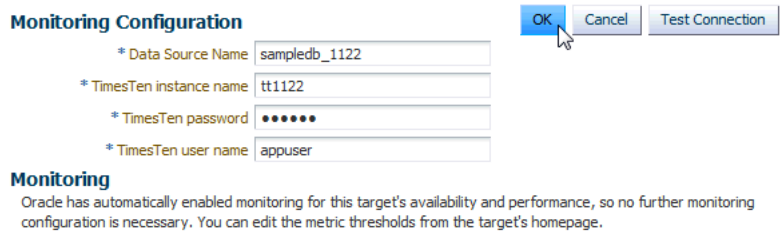


The target monitoring configuration page displays. Note that the Data Source Name, the TimesTen instance name, and the TimesTen username are auto-filled.

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**.

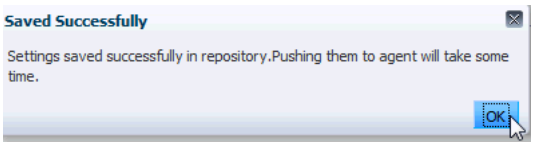
Figure 1–50 Click OK



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

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

Figure 1–51 Monitoring configuration saved successfully



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 1-18.

Uninstalling the System Monitoring 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 System Monitoring Plug-in for TimesTen 11*g*:

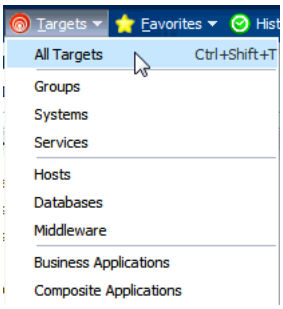
- Remove the TimesTen target
- Undeploy the plug-in from the Management Agent
- Undeploy the plug-in from OMS
- Delete the plug-in

Remove the TimesTen target

For each TimesTen target you wish to remove:

1. From the **Targets** menu, select **All Targets** on the Enterprise Manager Cloud Control 12*c* home page.

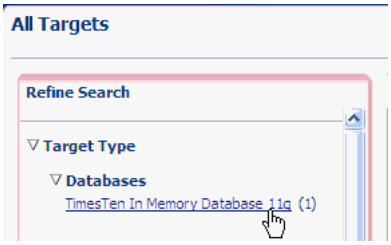
Figure 1–52 Choose All Targets



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

2. Expand **Target Type**, then **Databases** and click **TimesTen In Memory Database 11g**.

Figure 1–53 Choose TimesTen In Memory Database 11g

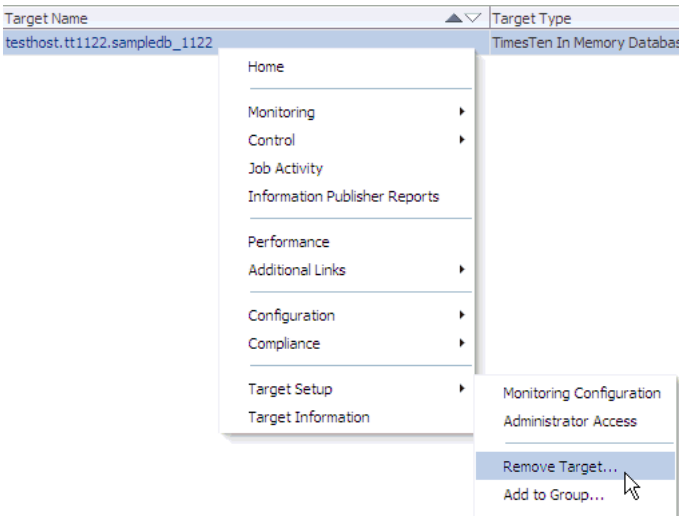


The target table displays. For each row in the table, confirm the column Target Type is **TimesTen In Memory Database 11g**. Also, confirm each row of the table contains the name of the target you previously configured. For more information on configuring a TimesTen target, see "Configure a TimesTen target" on page 1-15.

Locate the row that contains the target name you wish 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 1–54 Remove target

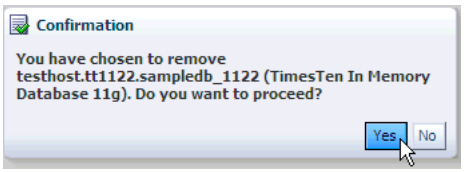


The Confirmation dialog displays the text "You have chosen to remove *TimesTen_target_name* (TimesTen In Memory Database 11*g*). Do you want to proceed?"

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

4. Click **Yes**.

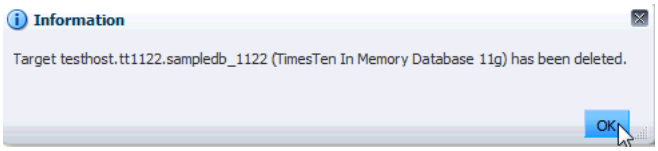
Figure 1–55 Remove target confirmation dialog



The Information dialog displays the text "Target TimesTen_target_name (TimesTen In Memory Database 11*g*) has been deleted" where *TimesTen_target_name* is the name of your TimesTen target.

5. Click **OK**.

Figure 1–56 Target removed



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.

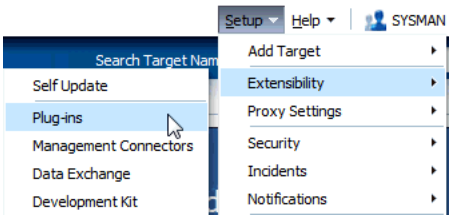
Note: Undeploy the plug-in from the Management Agents before you undeploy the plug-in from the Oracle Management Service (OMS).

Make sure you have removed all TimesTen targets. For more information on the steps to remove a TimesTen target, see "Remove the TimesTen target" on page 1-25.

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

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

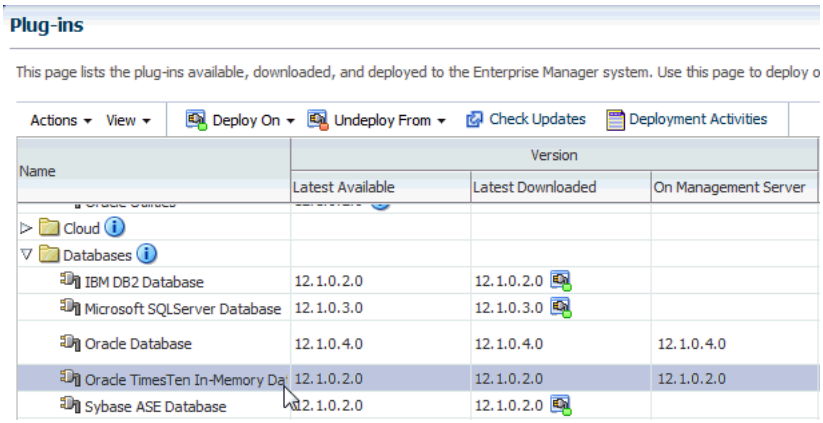
Figure 1–57 Choose Extensibility, then Plug-ins



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**.

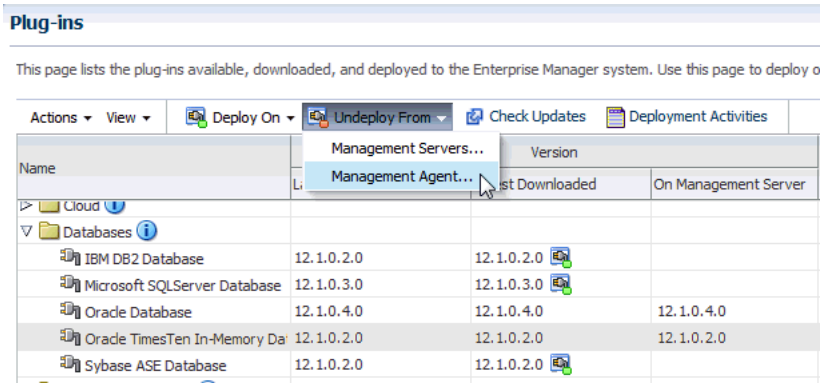
Figure 1–58 Choose Oracle TimesTen In-Memory Database plug-in



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...**.

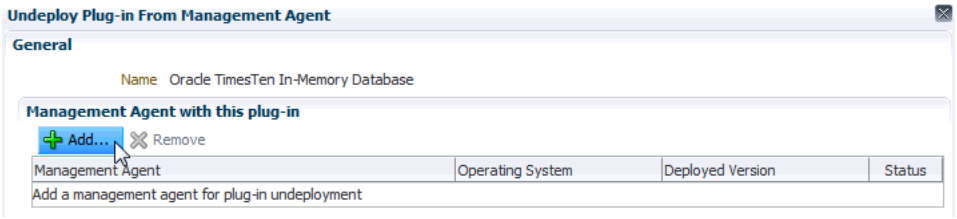
Figure 1–59 Undeploy from Management Agent



The Undeploy Plug-in on Management Agent General page displays. Note that the plug-in **Oracle TimesTen In-Memory Database** is displayed in the Name column. Locate the Add... tab below **Management Agent with this plug-in**.

4. Click **Add...**

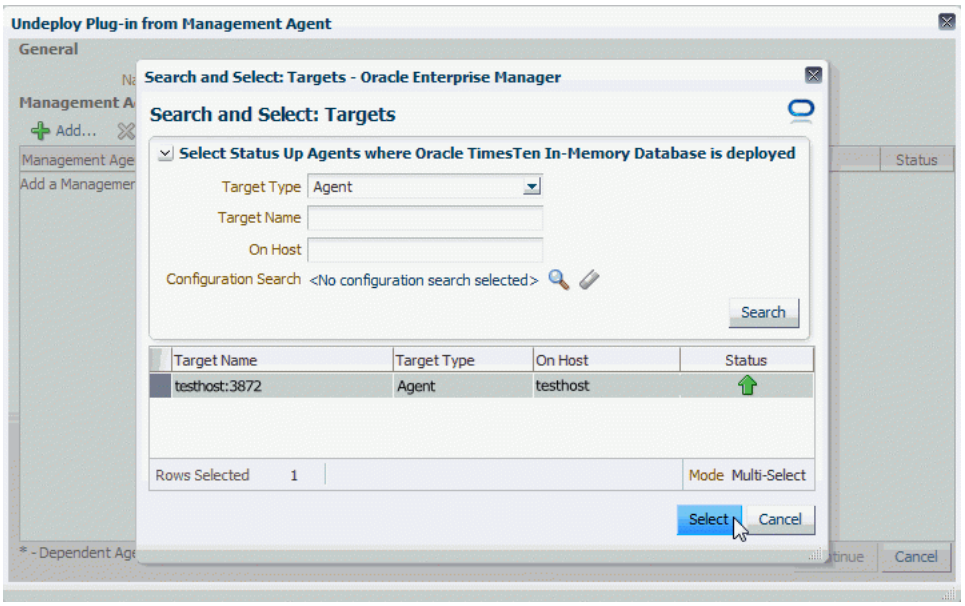
Figure 1–60 Click Add



The Search and Select: Targets - Oracle Enterprise Manager page displays. You are now ready to choose the agent to undeploy. Below the text "Select Status Up Agents where TimesTen In-Memory Database is deployed," make sure 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**.

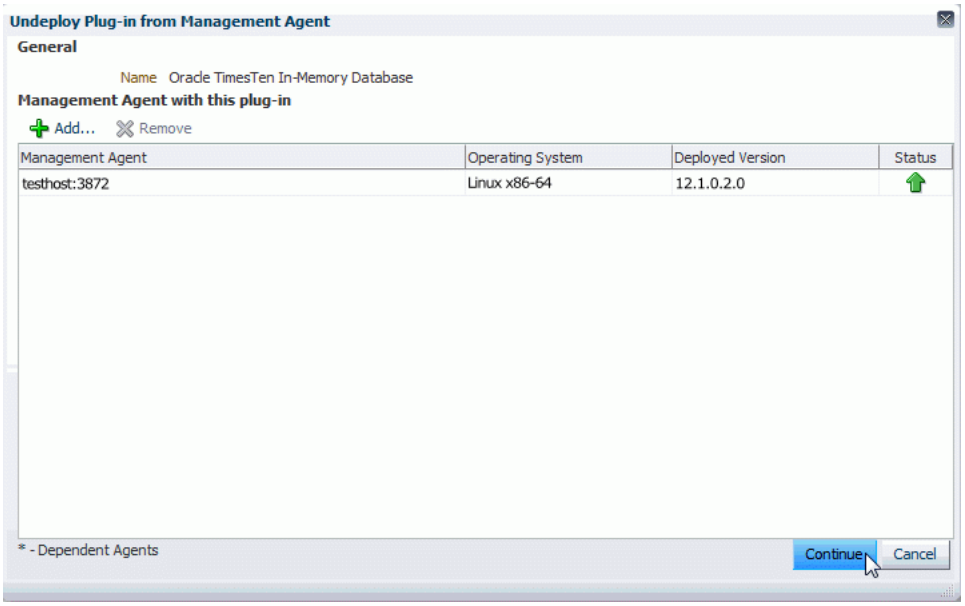
Figure 1–61 Choose agent to undeploy



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

6. Click **Continue**.

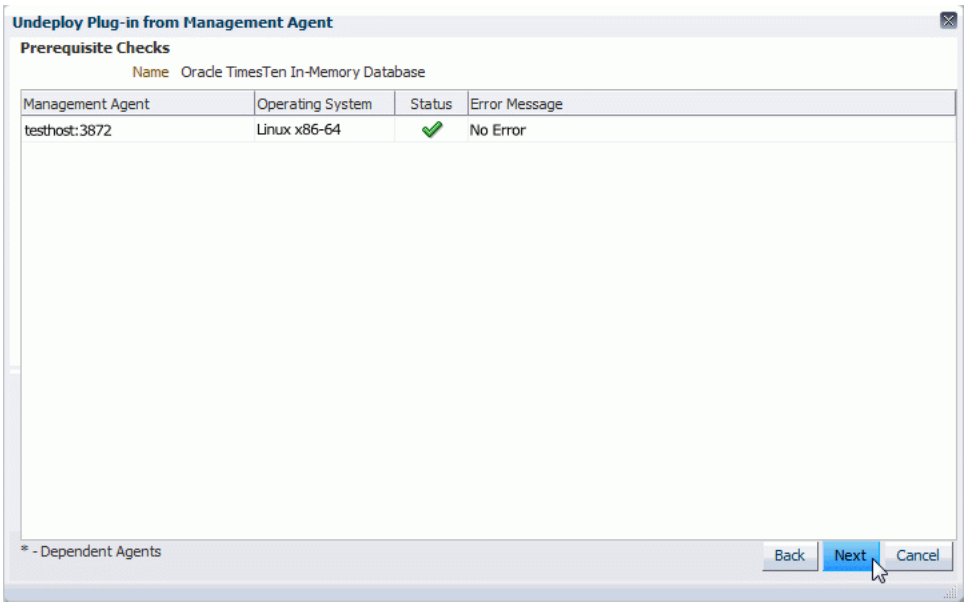
Figure 1–62 Click Continue



The Undeploy Plug-in From Management Prerequisite Checks page displays. Make sure there is a green check mark in the Status column of the Management Agent table.

7. Click **Next**.

Figure 1–63 Click Next

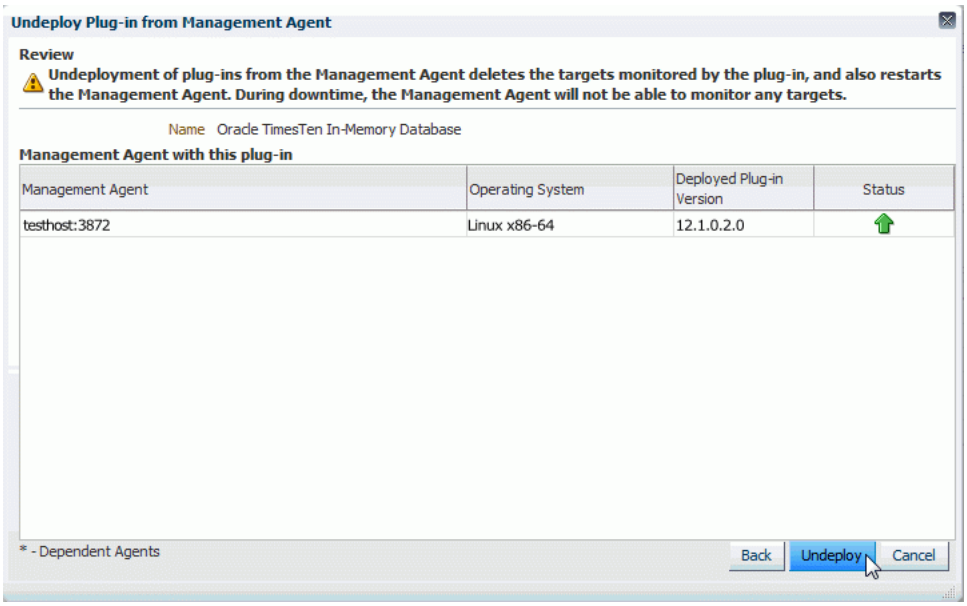


The Undeploy Plug-in From Management Agent Review page displays and shows the informational message, "Undeployment of plug-ins from the Management Agent deletes the targets monitored by the plug-in, and also restarts the Management Agent. During downtime, the Management Agent will not be able to monitor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

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

8. Click **Undeploy**.

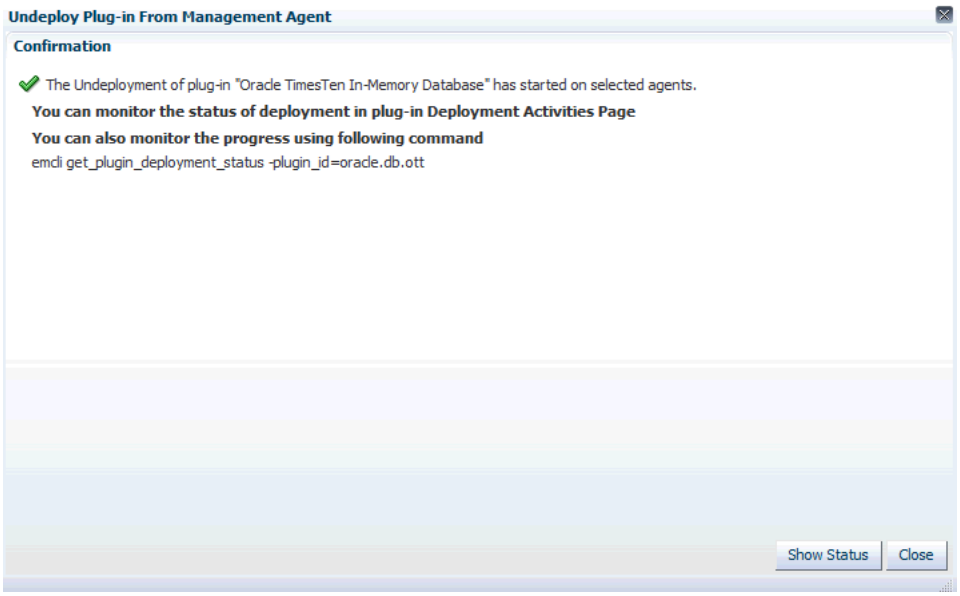
Figure 1–64 Click Undeploy



The Undeploy Plug-in from Management Agent Confirmation page 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.

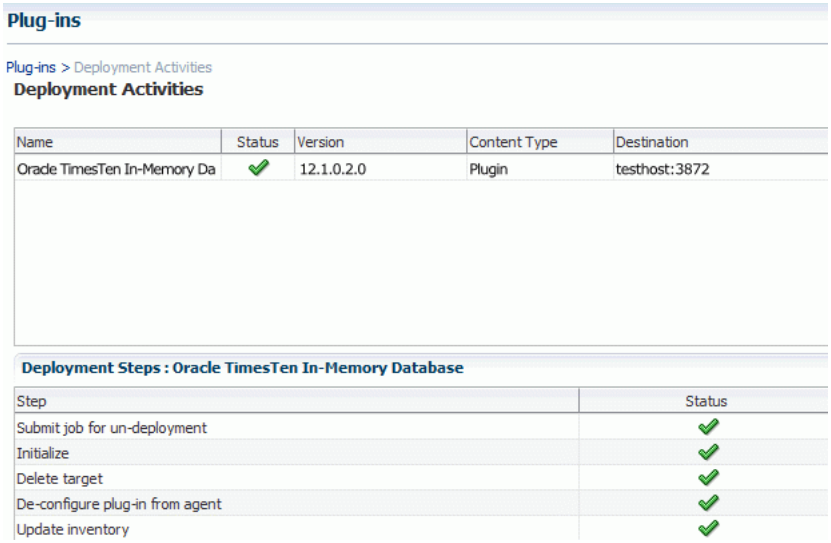
9. Click **Show Status**.

Figure 1–65 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, "Start undeployment" 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. Make sure 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, make sure there is a green check in the Status column in the undeployment table located at the top of the page.

Figure 1–66 Undeployment successful



The plug-in is undeployed 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 Server (OMS).

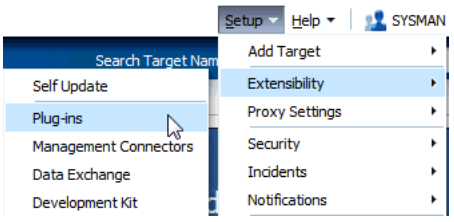
Undeploy the plug-in from OMS

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

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

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

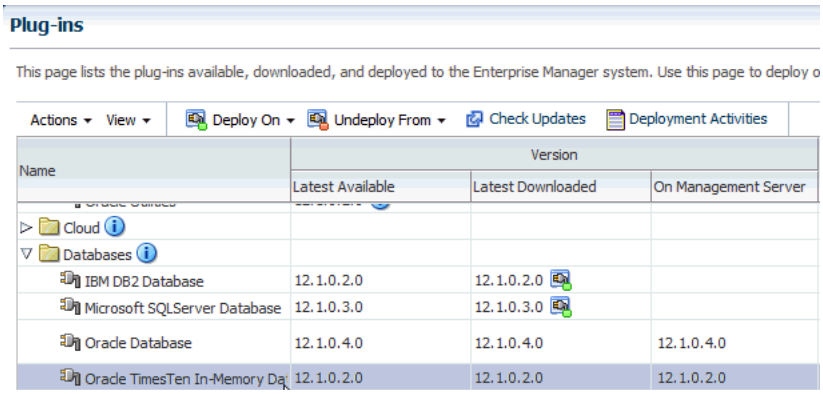
Figure 1–67 Choose Extensibility, then Plug-ins



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**.

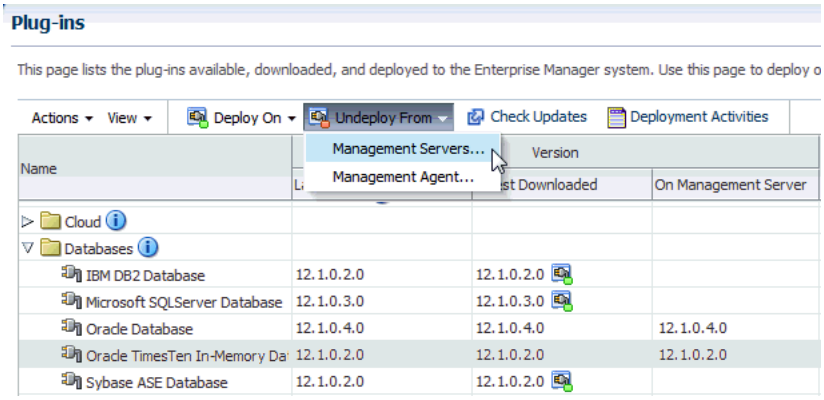
Figure 1–68 Choose TimesTen In-Memory Database plug-in



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...**.

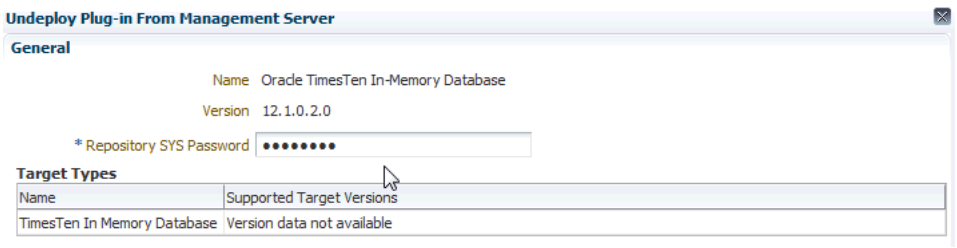
Figure 1–69 Undeploy from OMS



The Undeploy Plug-in from Management Server General page displays. Note that 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.

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

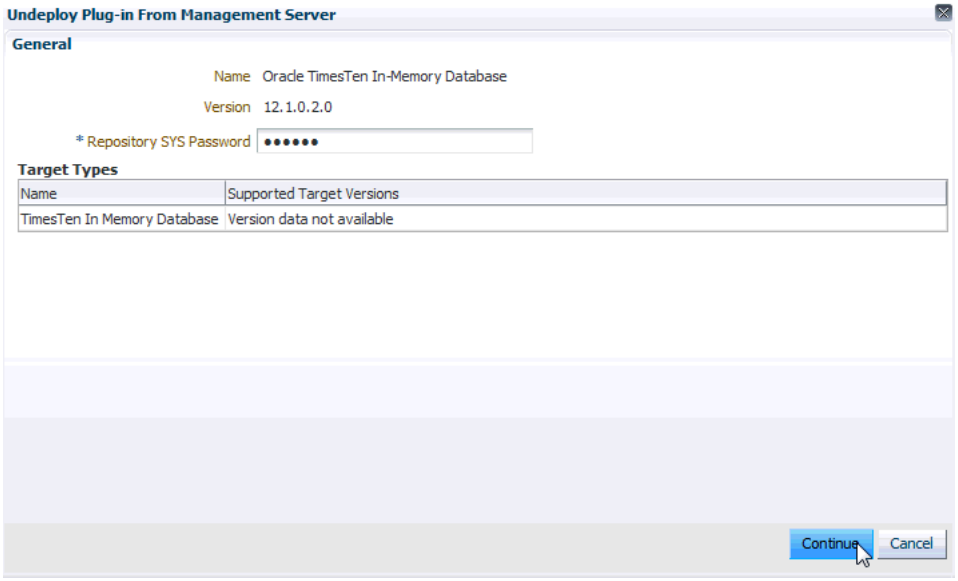
Figure 1–70 Repository SYS Password



Locate the Continue tab in the bottom right of the page.

5. Click **Continue**.

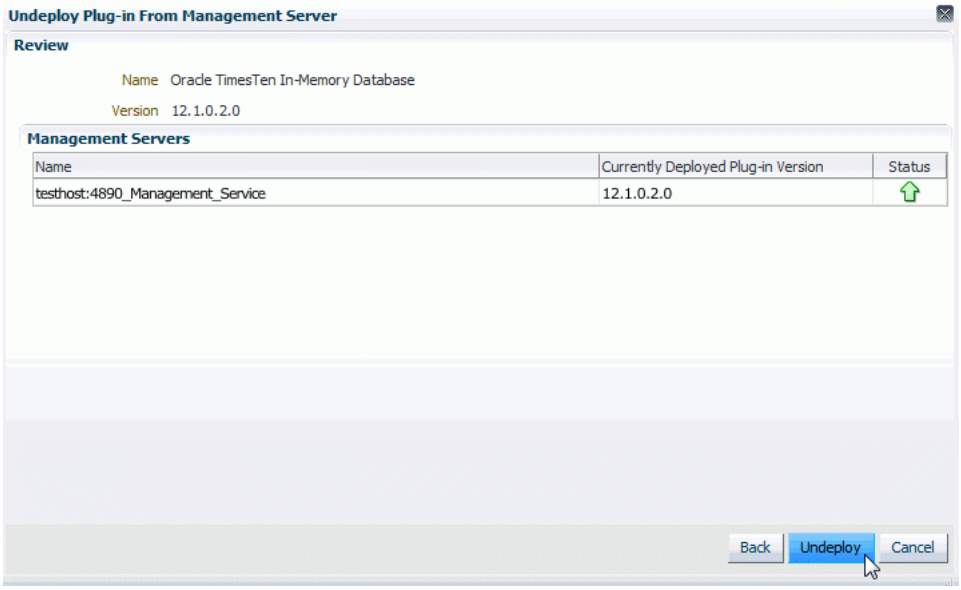
Figure 1–71 Click Continue



The Undeploy Plug-in From Management Server Review page displays. In the Management Servers table, verify the Management Server name is correct.

6. Click **Undeploy**.

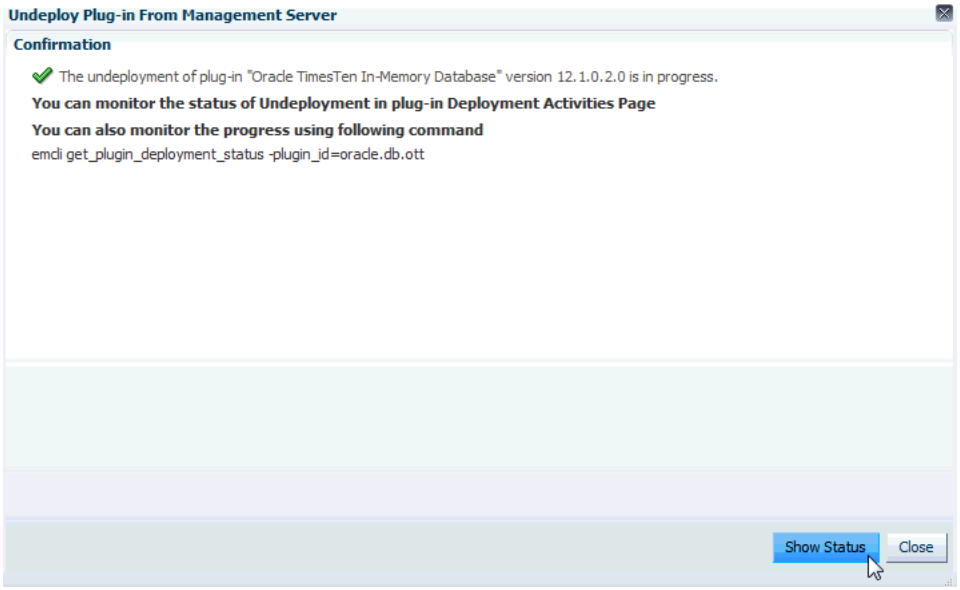
Figure 1–72 Review Undeploy from OMS



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.

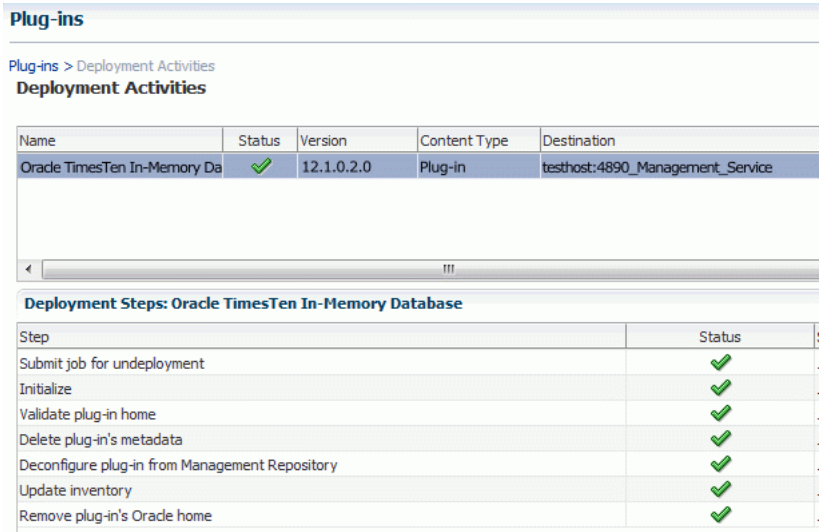
7. Click **Show Status**.

Figure 1–73 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. Make sure 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, make sure there is a green check in the Status column in the undeployment table located at the top of the page.

Figure 1–74 Undeployment of OMS successful



The plug-in is undeployed from OMS.

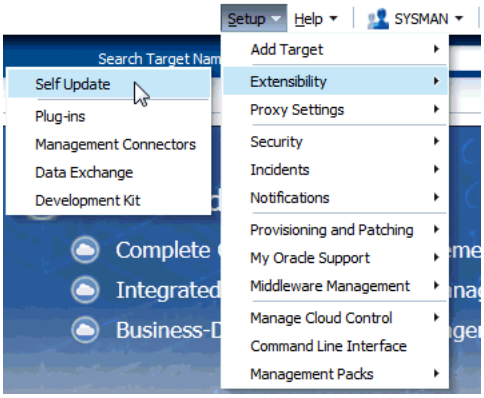
You are now ready to delete the plug-in from OMS and the Management Agent.

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, make sure you are on the Oracle Enterprise Manager Cloud Control home page.

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

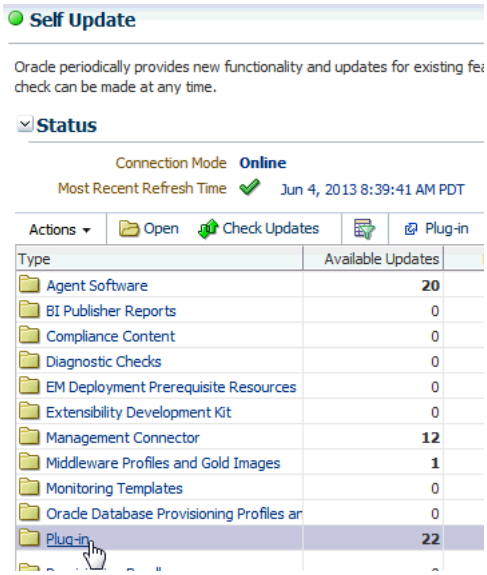
Figure 1–75 Choose Extensibility, then Self Update



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

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

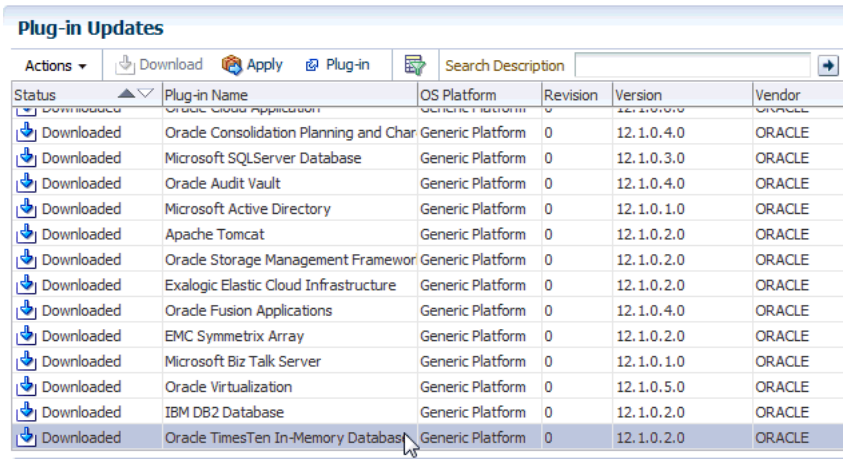
Figure 1–76 Plug-in folder



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**.

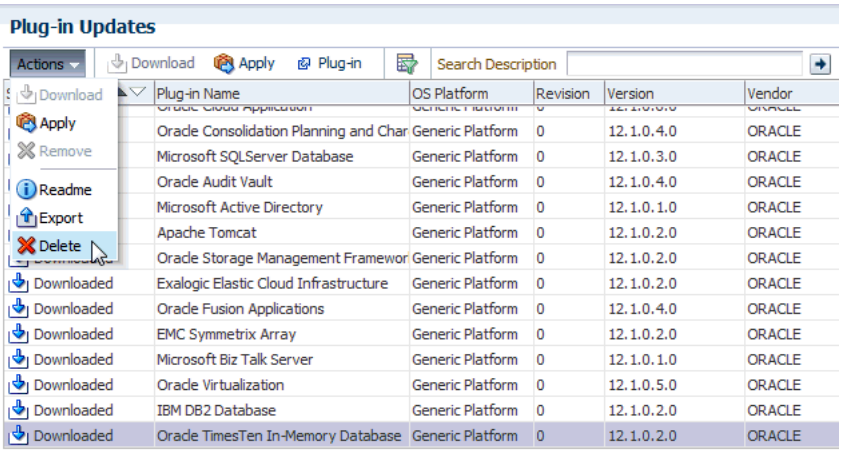
Figure 1–77 Plug-in updates



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

4. Expand **Actions** and choose **Delete**.

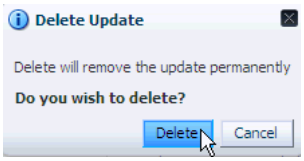
Figure 1–78 Delete plug-in



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**.

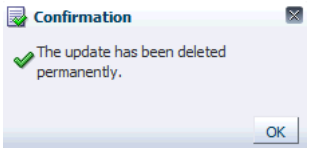
Figure 1–79 Delete Update confirmation



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

6. Click **OK.**

Figure 1–80 Plug-in deleted



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 and the performance of your database.

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 target page

Navigating to the TimesTen target page

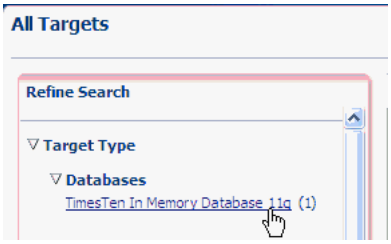
To navigate to the TimesTen target page:

1. From the **Targets** menu, select **All Targets** on the Enterprise Manager Cloud Control 12c home page.

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

2. Expand **Target Type**, then **Databases** and click **TimesTen In Memory Database 11g**.

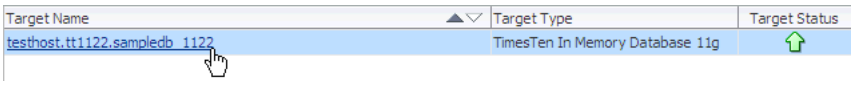
Figure 2–1 Choose TimesTen In Memory Database 11g



   The target table displays. For each row in the table, confirm the column Target Type contains **TimesTen In Memory Database 11g**. The number of rows is dependent 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. For each row, the Target Type equals **TimesTen In Memory Database 11g**.

3. In the column Target Name, identify the TimesTen target you wish 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

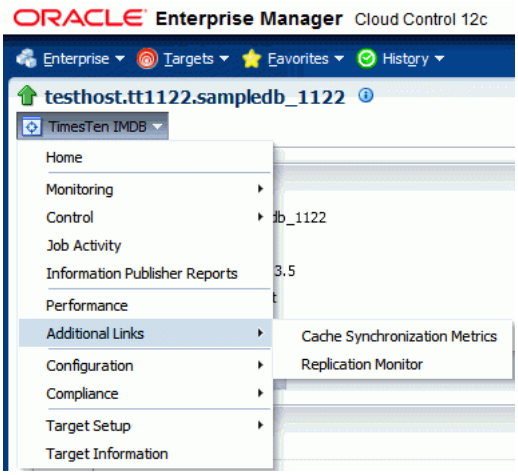


The TimesTen target page displays.

Overview of the TimesTen target page

The TimesTen target page allows you to gather monitoring and metrics information specific to TimesTen targets. Figure 2–3, "TimesTen target page" shows Enterprise Manager Cloud Control menu choices as well as menu choices that have been customized for TimesTen targets.

Figure 2–3 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. For more information, see Chapter 3, "Working with the TimesTen Home Page."

- **Monitoring - All Metrics**

  Displays metric information in table format. For more information, see Chapter 6, "Viewing Metrics."

- **Information Publisher Reports**

  Displays reports about your TimesTen database. For more information, see Chapter 8, "Viewing Reports."

- **Performance**

  Displays performance metrics in graphical format. For more information, see Chapter 4, "Working with the Performance Page."

- **Additional Links - Cache Synchronization Metrics**

  Displays cache synchronization metrics. For more information, see Chapter 5, "Working with the Cache Synchronization Metrics."

- **Additional Links - Replication Monitor**

Displays information for monitoring replication. For more information, see Chapter 7, "Working with the Replication Monitor."

3

Working with the TimesTen Home Page

This chapter describes the TimesTen home page. The 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, make sure 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 IMDB** menu, select **Home**.

The TimesTen home page displays.

Analyzing information on the TimesTen home page

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

The five home page regions described in detail include:

- Summary
- Status
- Configuration
- Performance Overview
- Issues

Summary

Figure 3–1 Summary region

This region shows information about your TimesTen target:

- Datastore name

  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 datastore name is `sampledb_1122`.

- Instance name

  The name of your current TimesTen instance.

- TimesTen version

  The version of your current TimesTen instance.

- Hostname

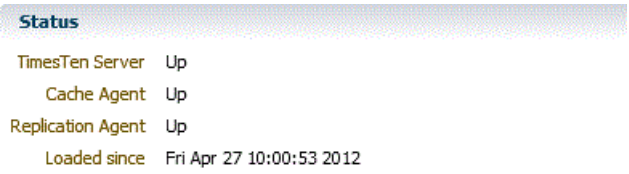
  The name of the host where TimesTen is running.

- Oracle Net Service Name

  The service name of the Oracle database used for cache. If you have not configured cache, then this value is N/A.

Status

Figure 3–2 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.

- Cache Agent

  This value can be either Up, Down, or N/A. If you have not configured a cache environment, then this value is N/A. The Cache Agent is used for read or write caching of data in an Oracle 10*g* or 11*g* database.

- Replication Agent

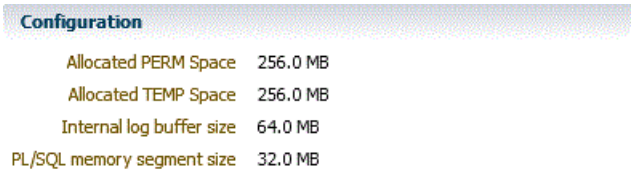
This value can be either Up, Down, or N/A. If you have not configured a replication scheme, then this value is N/A. The Replication Agent is used to either replicate data between TimesTen databases or to asynchronously write data to an Oracle 10*g* or 11*g* database.

- Loaded Since

  The date when the database was loaded into memory.

Configuration

Figure 3–3 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

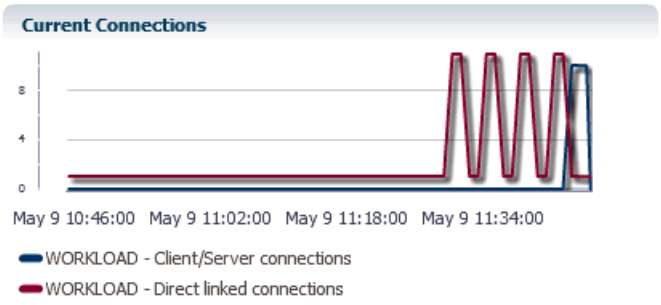
Performance Overview

The Performance Overview region consists of four subregions. The first three subregions include information represented in graphical format. All graphs are represented against time.

- Current connections
- Database usage (%)
- Free disk available (%)
- Executed statements - SQL command cache

Current connections

Figure 3–4 Current connections region

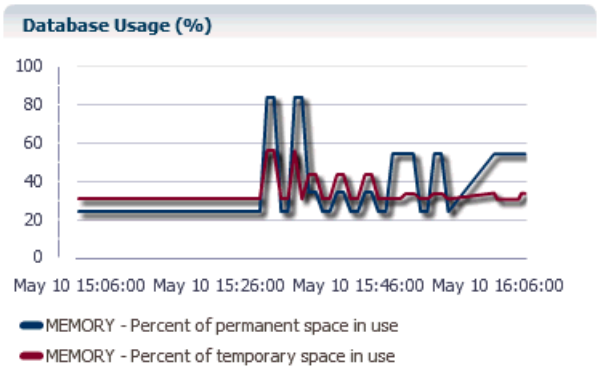


This region uses a line graph to show the number of direct linked connections and client/server connections. These line graphs change according to time in order to show not only the current value but also the values collected in recent metric collections.

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.

Database usage (%)

Figure 3–5 Database usage region



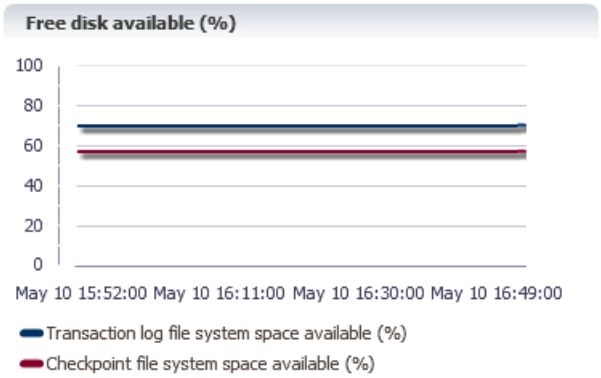
This region uses a line graphs to show permanent and temporary space currently in use. The values are expressed as a percentage of what was configured at database first connect. For information on the configured values, see the Summary, Status, and Configuration regions.

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.

Free disk available (%)

Figure 3–6 Free disk available region



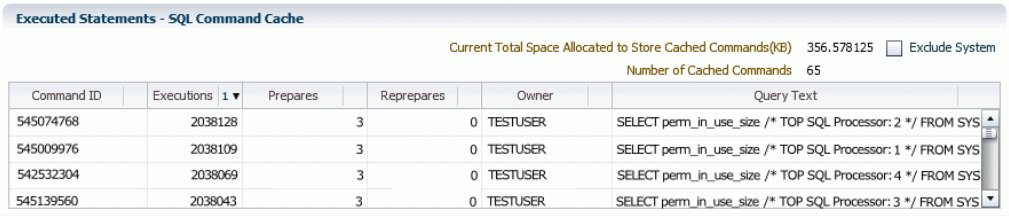
This region uses a graph to show the free space in the file systems where the checkpoint and transaction log files are currently located.

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.

Executed statements - SQL command cache

Figure 3–7 Executed statements - SQL command cache 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 Prepares 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 check to see if your application can be enhanced to minimize the number of prepares per SQL statement.

In addition, you can click on the text in the **Query Text** column. When you do this, a **Full SQL text** dialog opens showing the SQL query. 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 on the column header to sort the table based on the column. A description of each column follows:

- **Command ID**

  A unique identifier for the SQL command. This number is generated by the TimesTen database.

- **Executions**

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

- **Prepares**

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

- **Reprepares**

  A counter of the number of reprepares.

- **Owner**

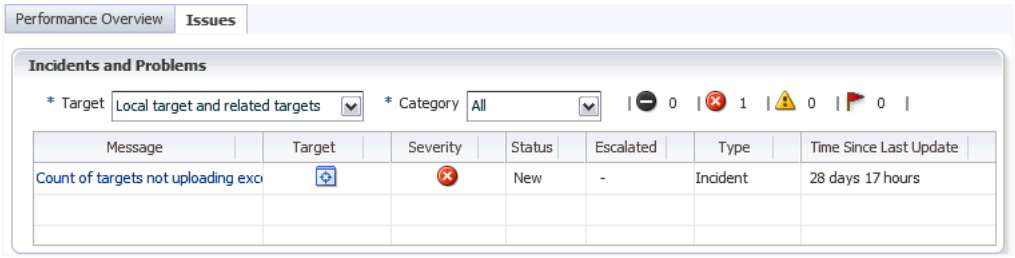
  The identifier of the user who created the command.

- **Query text**

  The SQL text.

Issues

Figure 3–8 Issues region



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

4

Working with the Performance Page

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

Topics include:

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

Viewing the performance page

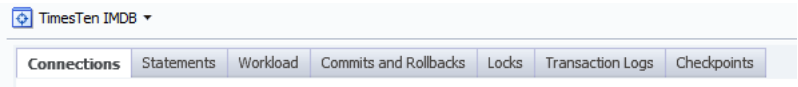
To view the performance page, make sure you are on the TimesTen target page. For information on navigating to the TimesTen target page, see "Navigating to the TimesTen target page" on page 2-1.

From the **TimesTen IMDB** menu, select **Performance**.

Analyzing information on the TimesTen performance page

Figure 4–1 shows the seven performance specific areas that have been customized for your TimesTen targets. Click on a specific tab to view detailed performance information.

Figure 4–1 Performance tabs



A description of each area follows:

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

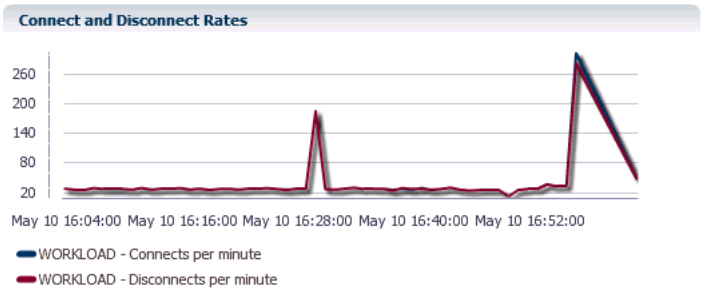
Connections

The connections page allows you to view information about database connections and disconnections. It is divided into two regions:

- Connect and disconnect rates
- Aggregates

Connect and disconnect rates

Figure 4–2 Connect and disconnect rates region



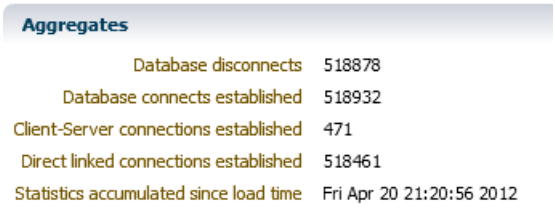
The Connect and Disconnect rates region uses a line graph to show the rate of connects and disconnect per minute.

The X-Axis represents time. The Y-Axis represents the rate of connects and disconnects per minute. These rates 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.

Aggregates

Figure 4–3 Aggregates region



The aggregates region shows information that has accumulated since the time your current TimesTen target was loaded into memory.

Statements

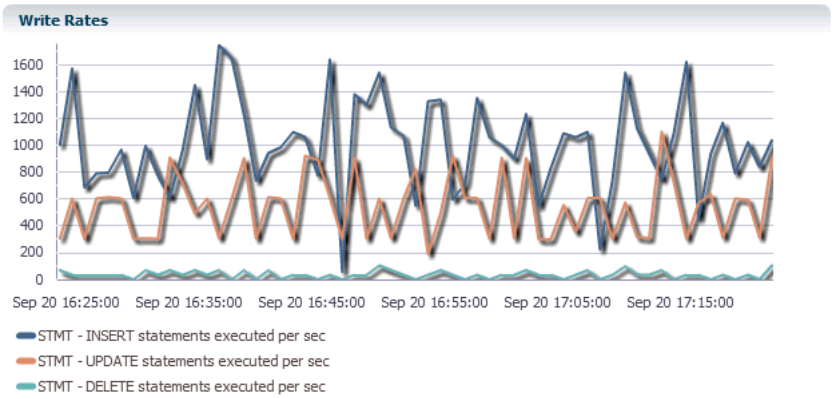
The statements page allows you to compare and review the execution rates of your SQL statements. It is divided into five regions:

- Write rates

- Read rate
- Ratio of prepare to execute rates
- Summary
- Detail

Write rates

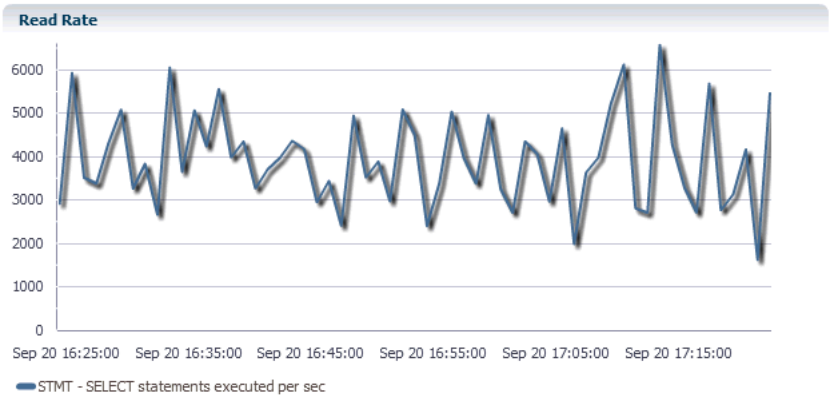
Figure 4–4 Write rates region



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

Read rate

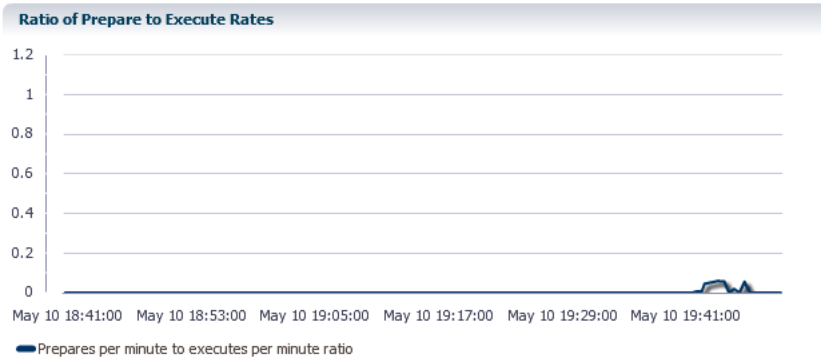
Figure 4–5 Read rate region



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

Ratio of prepare to execute rates

Figure 4–6 Ratio of prepare to execute rates 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. This means that the statements being executed are already in the SQL command cache and are already prepared. This results in less work that needs to be done to execute the statement.

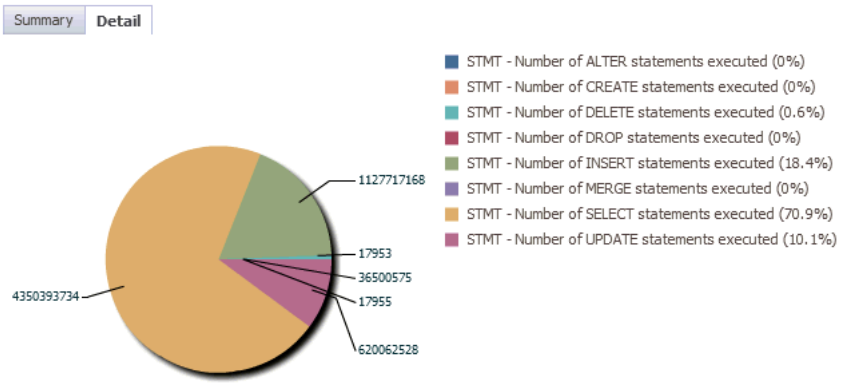
Summary

Figure 4–7 Summary region

The summary region shows the total number of statements that have executed since your TimesTen target was loaded into memory.

Detail

Figure 4–8 Statements detail region



The detail region uses a pie chart to break down each type of statement (For example, `SELECT`, `UPDATE`, `MERGE`, `DELETE` statements) and, for each type of statement, shows the number of executions relative to the total number of statements executed since your TimesTen target was loaded into memory.

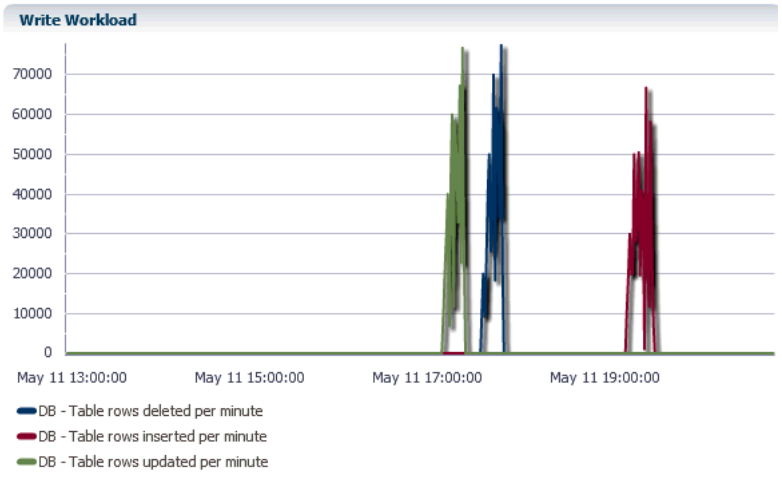
Workload

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

- Write workload
- Read workload
- Prepares and reprepares
- Aggregates

Write workload

Figure 4–9 Write workload



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

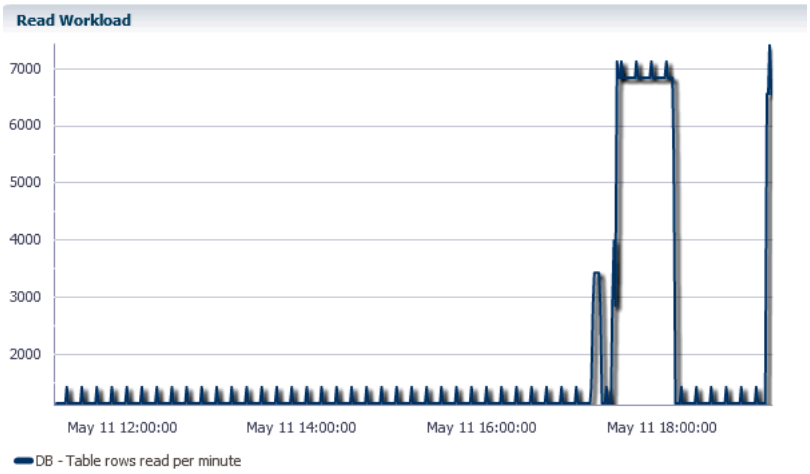
The write workload region is populated when the TimesTen database is enabled to collect all database and operating system statistics. To enable TimesTen to collect all database and operating system statistics, execute the `ttStatsConfig` built-in procedure with the `StatsLevel` parameter set to `ALL`.

```
call ttStatsConfig('StatsLevel','ALL');
```

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

Read workload

Figure 4–10 Read workload



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

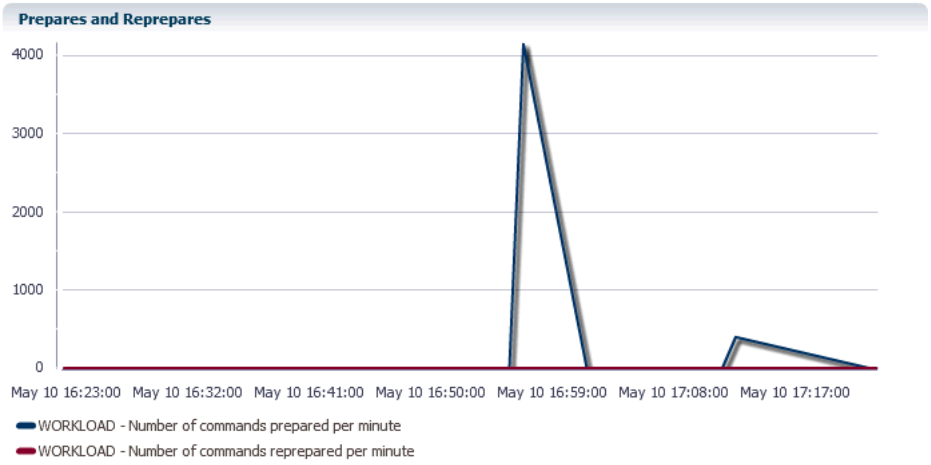
The read workload region is populated when the TimesTen database is enabled to collect all database and operating system statistics. To enable TimesTen to collect all database and operating system statistics, execute the `ttStatsConfig` built-in procedure with the `StatsLevel` parameter set to `ALL`.

```
call ttStatsConfig('StatsLevel','ALL');
```

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

Prepares and reprepares

Figure 4–11 Prepares and reprepares

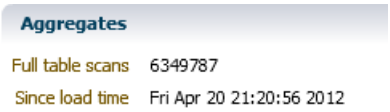


The prepares and reprepares region uses a line graph to show the number of commands prepared per minute and the number of commands reprepared per minute. If you see a high number of reprepared commands per minute, then this is an indication that there are invalidations occurring. This results in performance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

Aggregates

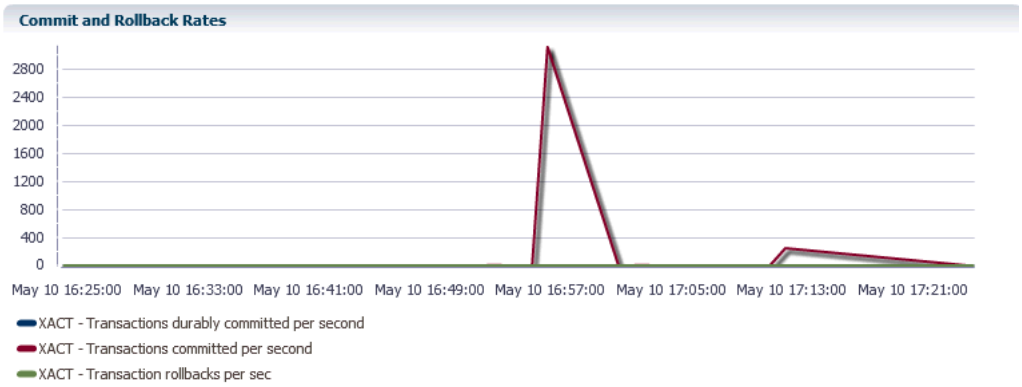
Figure 4–12 Aggregates region



The aggregates region shows the number of full table scans performed since your TimesTen target was loaded into memory. This number should be small because full table scans consume resources and can take considerable time to perform.

Commits and rollbacks

Figure 4–13 Commit and rollback rates 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 about the concurrent operations of your TimesTen target. It is divided into two sub-tabs:

- Lock performance
- Transaction monitor

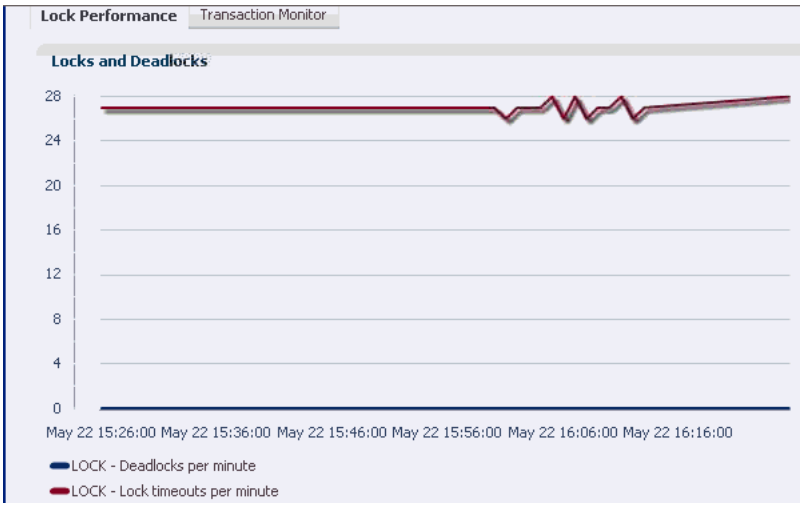
Lock performance

The lock performance sub-tab shows information related to the performance of the locks and concurrent operations of your TimesTen target. The sub-tab is divided into three regions:

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

Locks and deadlocks

Figure 4–14 Locks and deadlocks region



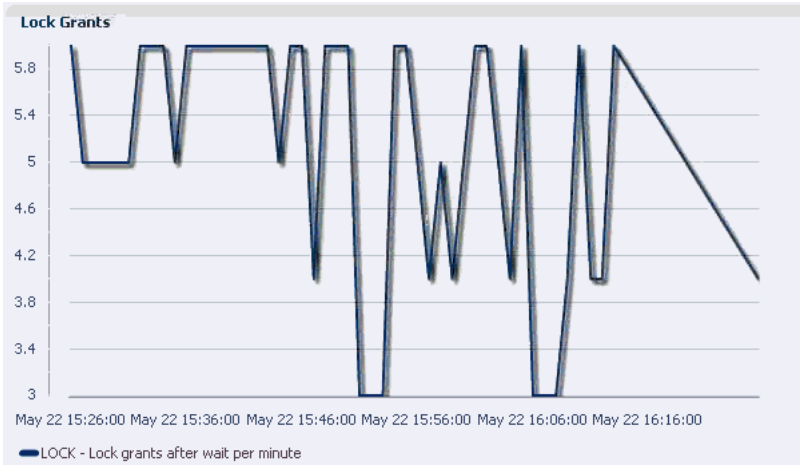
The locks and deadlocks region uses a line graph to show the rate of deadlocks per minute and the lock timeouts per minute.

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 "Transaction monitor" on page 4-10.

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 "Transaction monitor" on page 4-10.

Lock grants

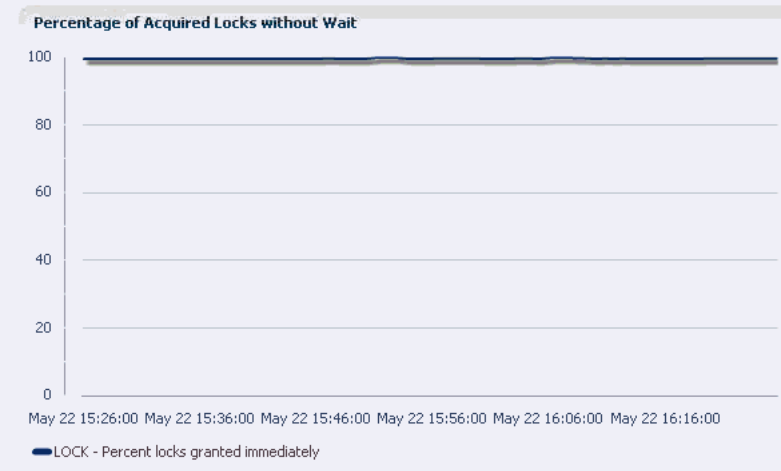
Figure 4–15 Lock grants



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 4–16 Percentage of acquired locks without wait



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 monitor

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.

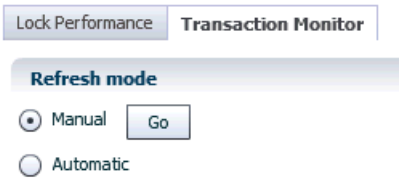
Before using the transaction monitor, make sure preferred credentials are set for your TimesTen. For more information about setting preferred credentials, see "Setting preferred credentials for a target" on page 1-20.

The transaction monitor sub-tab is divided into four regions:

- Refresh mode
- Outstanding locks
- Lock details
- Awaiting locks

Refresh mode

Figure 4–17 Refresh mode



Refresh mode allows you to control how the transaction monitor is refreshed:

- **Manual**

  The transaction monitor starts in manual mode. Click **Go** to refresh the transaction monitor report.

- **Automatic**

  The automatic mode allows you to select how often the transaction monitor is refreshed.

  To start automatic refresh mode:

  1. Click in the circle to the left of **Automatic**.
  2. In the **Refresh interval in seconds** field, specify a time interval. For example if you specify a time interval of 5, the transaction monitor refreshes every 5 seconds.
  3. Click **Go**.

Figure 4–18 Automatic refresh mode

  Once automatic refresh mode is active, the **Go** button is replaced with a **Stop** button.

  It may be useful to stop automatic refresh mode if there are no active transactions. To stop automatic refresh mode, click in the box to the left of **Stop when there are no transactions**.

  You cannot change the refresh interval while automatic mode is running. Stop automatic refresh mode first.

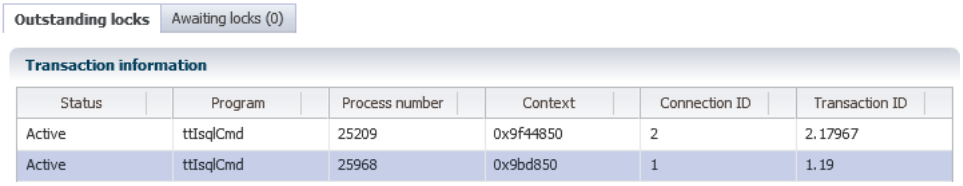
  To stop automatic refresh mode:

  Click **Stop**.

  The automatic refresh mode stops and allows you to modify the refresh interval and switch the refresh mode to manual.

Outstanding locks

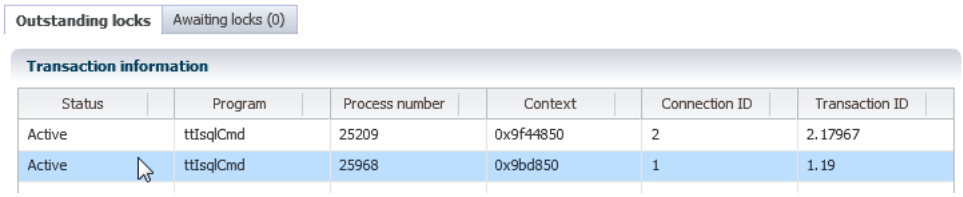
Figure 4–19 Outstanding locks



The outstanding locks region displays the current transactions that are holding locks in your database.

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

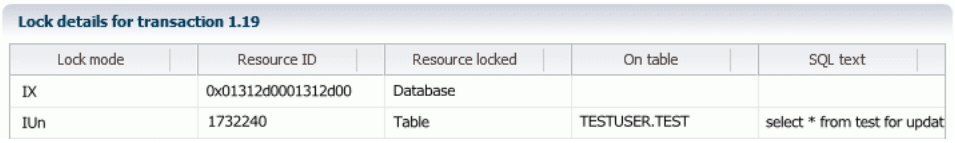
Figure 4–20 Select a transaction



The lock information for your selected transaction displays in the lock details region.

Lock details

Figure 4–21 Lock details



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

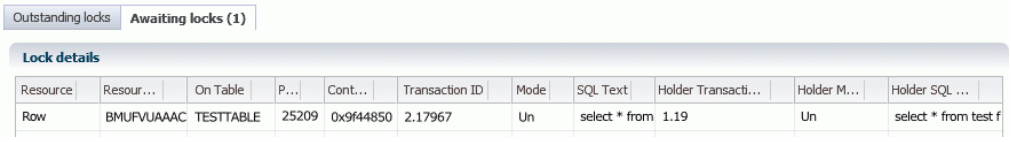
The number of locks in the lock details region should be low. If you see a large number of locks, review the way your application is acquiring locks.

You can also click on the text in the **SQL text** column. When you do this, a **Full SQL text** dialog opens showing the SQL query. Review the SQL query to understand the SQL that is holding locks.

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

Awaiting locks

Figure 4–22 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, see "ttXactAdmin" in the *Oracle TimesTen In-Memory Database Reference.*

You can also click on the text in the **Holder SQL text** column. When you do this, a **Full SQL text** dialog opens showing both the SQL query that is waiting for the lock and the SQL query that is holding the lock.

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

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

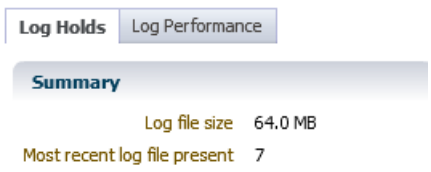
Log holds

The log holds page provides a report of the logs that are being held for the different operations that are running on your TimesTen target. Such operations include transactions, checkpoints, and replication. The log holds sub-tab is divided into two regions:

- Summary
- Log holds

Summary

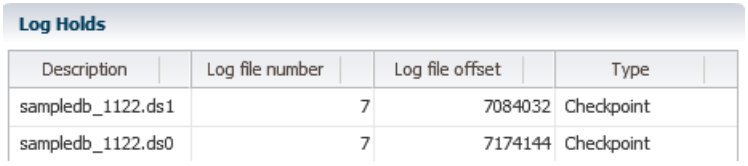
Figure 4–23 Summary



The summary region shows log file size and the most recent log file present.

Log holds

Figure 4–24 Log holds



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 log buffer to be purged.

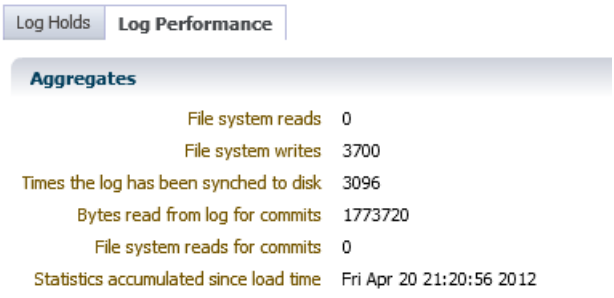
Log performance

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

- Aggregates
- Log reads and log flushes
- Log buffer wait

Aggregates

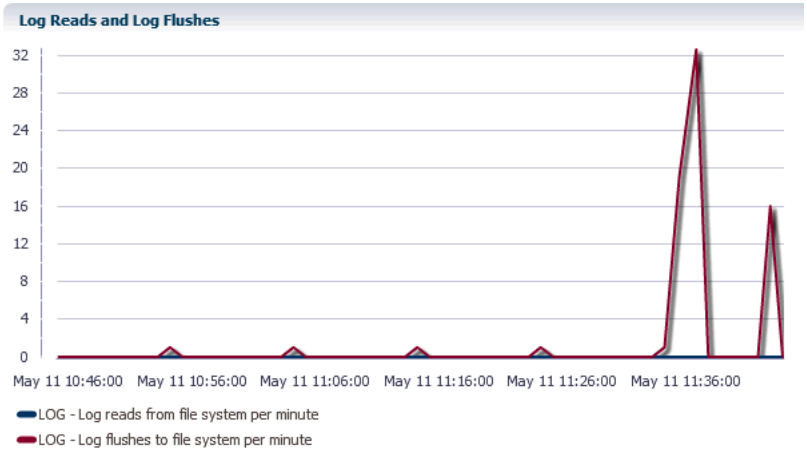
Figure 4–25 Aggregates region



The aggregates regions displays information that has been accumulating since the current TimesTen target has been loaded into memory.

Log reads and log flushes

Figure 4–26 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 4–27 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.

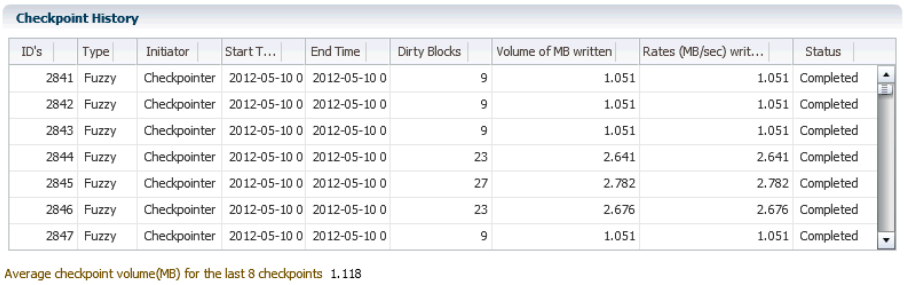
Checkpoints

The checkpoints page displays checkpoints history and a summary of cumulative values related to checkpoint operations. It is divided into two regions:

- Checkpoint history
- Aggregates

Checkpoint history

Figure 4–28 Checkpoint history



The checkpoint history table shows the checkpoint history for the last 24 hours. ID is a unique numeric identifier for the checkpoint. IDs increase monotonically during the lifetime of the database. If you destroy the database, the IDs 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 IDs are likely to be small and are at the bottom of the table. If you wish to see the new database IDs at the top of the table, sort by Start Time.

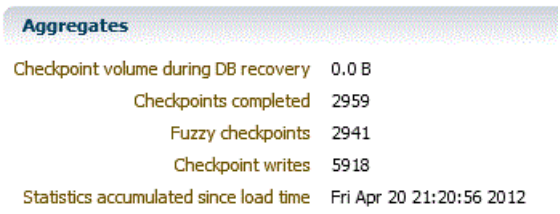
Valid values for Type are static, blocking, fuzzy, or none. Valid values for initiator are user, checkpointer, or subdaemon. For the Dirty Blocks column, the values are the number of dirty blocks written. These are blocks that were modified since the last checkpoint. For the Rates column, the value is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

The TimesTen plug-in polls the TimesTen 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.

The Average checkpoint volume for the last eight checkpoints is included at the end of the table. The volume is expressed in Megabytes.

Aggregates

Figure 4–29 Aggregates region



The aggregates region shows values that have been accumulating since the time your TimesTen target was loaded into memory.

5

Working with the Cache Synchronization Metrics

This chapter describes the Cache Synchronization Metrics page.

Topics include:

- Viewing the cache synchronization metrics
- Analyzing cache synchronization metrics

Viewing the cache synchronization metrics

The cache synchronization metrics shows cache specific performance information. In order to view the metrics, make sure you have configured a cache environment for your TimesTen target and make sure the cache agent is up.

To view the cache synchronization metrics, make sure 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 IMDB** menu, select **Additional Links**, then select **Cache synchronization metrics**.

Analyzing cache synchronization metrics

The TimesTen cache synchronization metrics page consists of two panes each of which have been customized for TimesTen cache environments. The left pane shows cache related performance data that 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 right pane shows cache related performance data represented in graphical format.

The left pane consists of:

- Cache autorefresh
- Cache AWT
- Cache SWT
- Cache flush

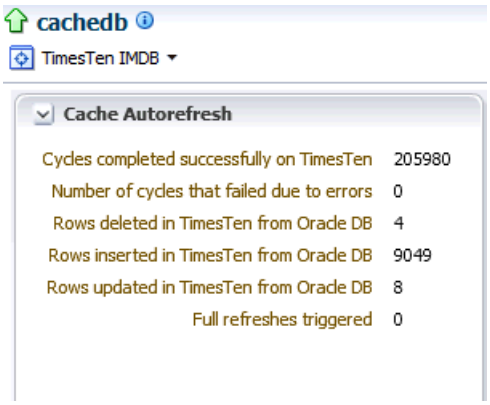
The right pane consists of the following graphs:

- AWT transactions propagated to Oracle DB
- AWT transactions committed on Oracle DB

- Transactions committed on TimesTen
- AWT batch performance
- AWT volume (mb) per sec

Cache autorefresh

Figure 5–1 Cache autorefresh

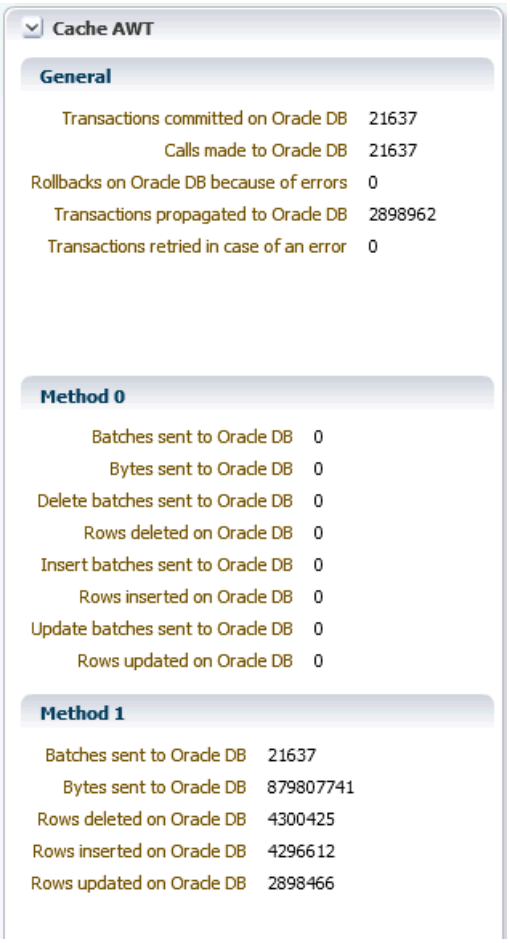


The cache autorefresh region shows the number of rows deleted, inserted, and updated in TimesTen from the Oracle DB. The number of cycles that completed successfully and the number of cycles that failed on TimesTen are also displayed.

Cache AWT

Click the arrow to the left of **Cache AWT** to expand the Cache AWT region.

Figure 5–2 Cache AWT



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 method 0 and method 1 of AWT cache are also displayed.

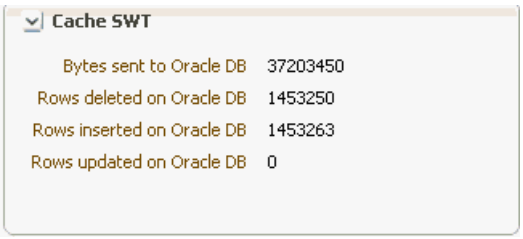
The method determines whether the PL/SQL execution method or the SQL array execution method is used to apply changes to the Oracle database server for Asynchronous Writethrough propagation. Method 0 uses SQL array execution. Method 1 uses PL/SQL collections and anonymous blocks.

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

Cache SWT

Click the arrow to the left of **Cache SWT** to expand the Cache SWT region.

Figure 5–3 Cache SWT

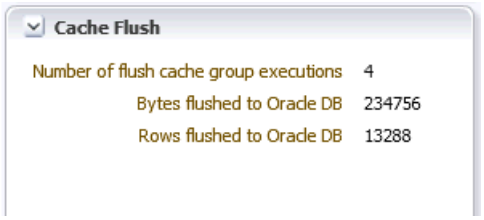


The cache SWT region shows the number of bytes sent, rows deleted, rows inserted, and rows updated on the Oracle database for SWT cache.

Cache flush

Click the arrow to the left of **Cache Flush** to expand the Cache Flush region.

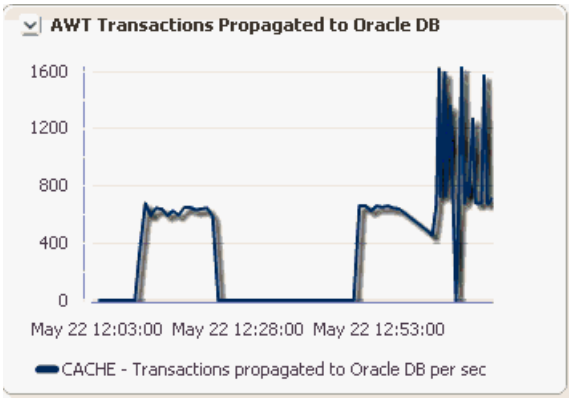
Figure 5–4 Cache flush



The cache flush region shows the number of flush cache group executions as well as the number of bytes and rows flushed to the Oracle database.

AWT transactions propagated to Oracle DB

Figure 5–5 AWT transaction propagated to Oracle DB

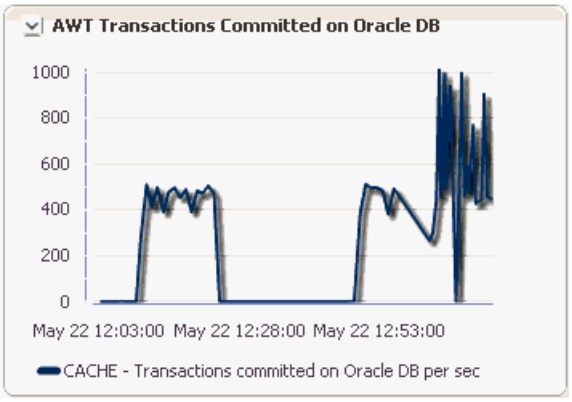


The AWT transactions propagated to the Oracle DB region uses a line graph to show the number of AWT transactions propagated to the Oracle DB per second.

The X-Axis represents time. The Y-Axis represents the AWT transactions propagated to the Oracle DB per second.

AWT transactions committed on Oracle DB

Figure 5–6 AWT transactions committed on Oracle DB

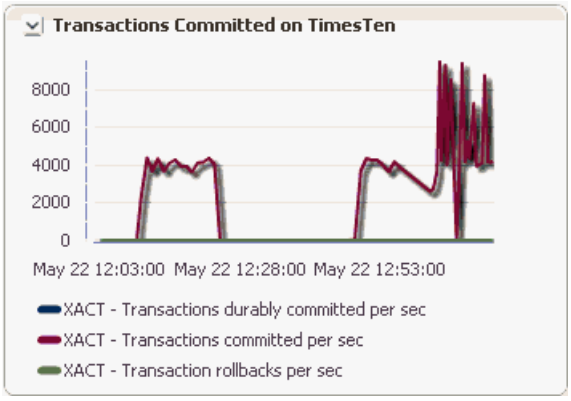


The AWT transactions committed on the Oracle DB region uses a line graph to show the number of AWT transactions committed on the Oracle DB. This region is presented on the same page as Transactions committed on TimesTen in order that you can compare transaction activity on both the Oracle DB and TimesTen.

The X-Axis represents time. The Y-Axis represents the number of AWT transactions committed on the Oracle DB per second.

Transactions committed on TimesTen

Figure 5–7 Transactions committed on TimesTen

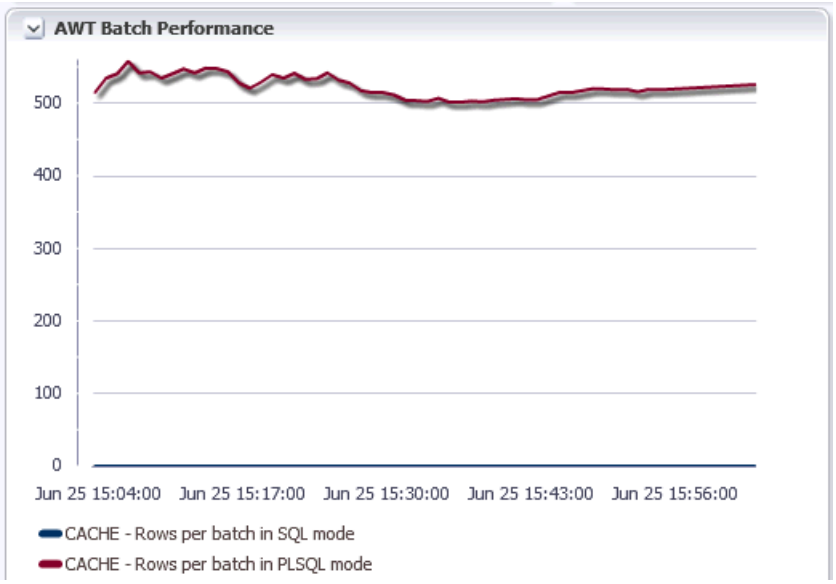


The transactions committed on TimesTen region uses a line graph to show the number of total transactions committed on TimesTen. This region is presented on the same page as AWT transactions committed on Oracle DB in order that you can compare transaction activity on both the Oracle DB and TimesTen.

The X-Axis represents time. The Y-Axis represents the number of AWT transactions durably committed, AWT transactions committed, and AWT transaction rollbacks on TimesTen per second.

AWT batch performance

Figure 5–8 AWT batch performance

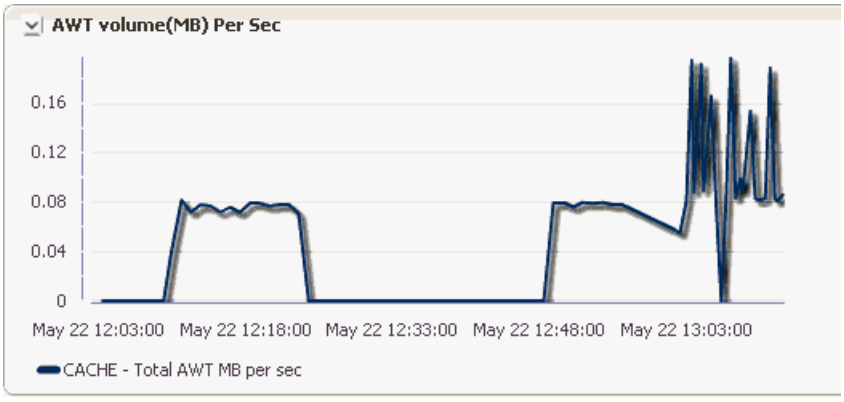


The AWT batch performance region uses a line graph to show AWT Batch performance represented as a rate of rows per batch.

The X-Axis represents time. The Y-Axis represents the rate of rows per batch in SQL mode (`CacheAWTMethod`=0) and PL/SQL mode (`CacheAWTMethod`=1).

AWT volume (mb) per sec

Figure 5–9 AWT volume per second



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

The X-Axis represents time. The Y-Axis represents total AWT volume (in megabytes) per second.

6

Viewing Metrics

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

Topics include:

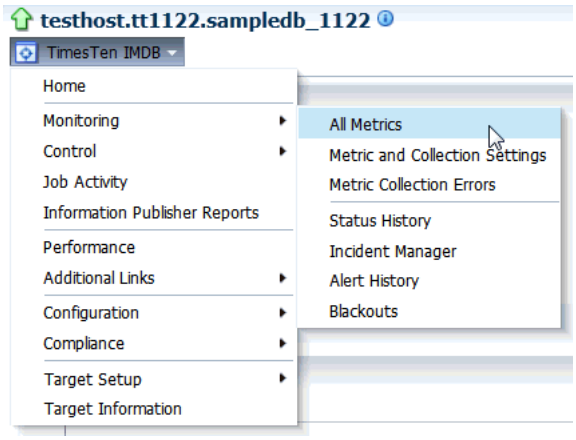
- Navigating to the metrics page
- Viewing metrics

Navigating to the metrics page

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

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

Figure 6–1 All Metrics



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

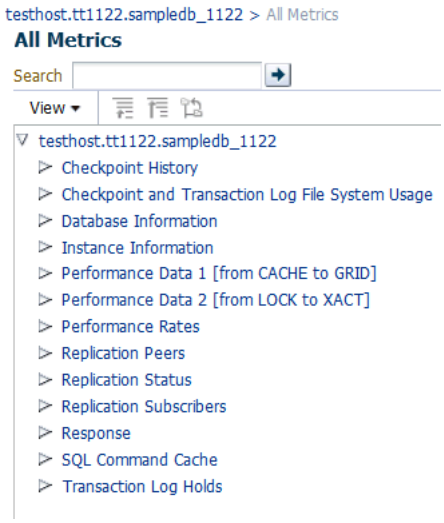
2. Expand the metric group, and click the **name of the metric**.

The metric information displays in table format.

Viewing metrics

There are 12 groups of metrics:

Figure 6–2 Groups of metrics



- Checkpoint history
- Checkpoint and transaction log file system usage
- Database Information
- Instance information
- Performance data
- Performance rates
- Replication peers
- Replication status
- Replication subscribers
- Response
- SQL command cache
- 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 6–1 lists each metric and provides a description of the metric.

Table 6–1 Checkpoint History

Metric	Description
Bytes written in MB	Bytes written in megabytes.
Bytes written per sec	Bytes written per second.
Checkpoint sequence number	Checkpoint sequence number.
Of blksTotal, the number of blocks currently in use	Of blksTotal, the number of blocks currently in use.

Table 6–1 (Cont.) Checkpoint History

Metric	Description
Permanent blocks currently allocated in the database	Permanent blocks currently allocated in the database.
Status of the checkpoint operation	Status of the checkpoint operation.
The database file number used by the checkpoint	The database file number used by the checkpoint.
The number of bytes occupied by blksDirty	The number of bytes occupied by blksDirty.
The number of bytes occupied by blksInUse	The number of bytes occupied by blksInUse.
The number of bytes occupied by blksTotal	The number of bytes occupied by blksTotal.
The number of dirty blocks written by this checkpoint	The number of dirty blocks written by this checkpoint.
The source of the checkpoint request	The source of the checkpoint request.
The total number of bytes written by this checkpoint	The total number of bytes written by this 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.
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`.
The type of checkpoint	The type of checkpoint.
Time when the checkpoint completed	Time when the checkpoint completed.
Time when the checkpoint was begun	Time when the checkpoint began.
TimesTen error number which indicates the reason for the failure	TimesTen error number that indicates the reason for the failure.

Checkpoint and transaction log file system usage

Table 6–2 lists each metric and provides a description of the metric.

Table 6–2 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 size (MB)	Transaction log file system size in megabytes.
Transaction log file system	Transaction log file system.

Table 6–2 (Cont.) Checkpoint and Transaction Log File System Usage

Metric	Description
Transaction log file system mount point	Transaction log file system mount point.
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 Information

Table 6–3 shows information about your database.

Table 6–3 Database Information

Database information	Description
Active standby pair table creation replication	Database attribute is `DDLReplicationAction`. If set to '`INCLUDE`' (the default): When a table is created, the table is automatically added to the active standby pair scheme. If set to '`EXCLUDE`': When a table is created, the table is not automatically included in the active standby pair.
Amount of data in log between background checkpoints	Amount of data in megabytes that collects in log between background checkpoints.
Cache agent policy	Cache agent policy (always, manual).
Cache agent running	1 if running; 0 if not running.
Character encoding for the connection	Character encoding for the connection. May be different than database character set.
Commit operations should write log records to disk	If set (=1), commit operations write log records to disk.
Controls conditional compilation of PL/SQL units	Controls conditional compilation of PL/SQL units.
Controls transactional commit behavior in relation to DDL	Controls transactional commit behavior in relation to DDL. If 0, Oracle. If 1, Timesten.
Determines if commands are shared between connections	Determines if commands are shared between connections.
Determines whether PL/SQL is enabled	Determines if PL/SQL is enabled. (1 = enabled.)
Enables AWT propagation method to be used on Oracle tables	Database attribute is `CacheAWTMethod`. Determines whether PL/SQL execution method or SQL array execution method is used for Asynchronous Writethrough propagation to apply changes to the Oracle server. If 0, SQL array execution method is used. If 1 (the default), PL/SQL execution method is used.
Enables cache grid	If set (=1), cache grid is enabled.
Enables transparent load to dynamic cache groups	If set (=1), enables transparent load of Oracle data to dynamic cache groups.

Table 6–3 (Cont.) Database Information

Database information	Description
Error returned upon transparent load failure	If set (=1), error message is returned if there is a transparent load failure.
Expected upper bound for concurrent connections	Indicates the expected upper bound on the number of concurrent connections to the database.
Frequency in seconds for background checkpoint	Frequency in seconds that TimesTen performs a background checkpoint.
Identifies the character set used by the data store	Identifies the character set used by the database.
Identifies the physical data store	Identifies the physical database.
Is error reported for data loss from character type conversion	Determines if error is reported when there is data loss during an implicit or explicit character type conversion between `NCHAR/NVARCHAR2` and `CHAR/VARCHAR2` data.
Isolation level read committed or serializable	Specifies whether the isolation level is read committed or serializable. If 1, read committed.
Level of DDL replication enabled	Database attribute is `DDLReplicationLevel`. If 1, replicates `ALTER TABLE ADD` or `DROP COLUMN` to the standby database. Does not replicate `CREATE` and `DROP` operations for tables, indexes or synonyms to the standby database. If 2 (the default), replicates creating and dropping of tables, indexes and synonyms.
Location of PL/SQL memory segment	Virtual address of shared memory segment that is loaded into each process that uses the TimesTen "direct" drivers.
Lock wait interval	Lock wait interval for connection.
Max rate data written to disk during checkpoint	Maximum rate data is written to disk during a checkpoint operation.
Maximum process heap memory PL/SQL can use for this connection	Specifies the maximum amount of process heap memory in megabytes that PL/SQL can use for the connection.
Method used to write and sync log data to transaction log files	Method used to write and sync log data to transaction log files. If 1, buffered writes are used to write data to transaction log files.
Number of tracks available for parallel replication	Database attribute is `ReplicationParallelism`. Possible values are between 1 and 64, indicating the number of tracks to replicate in parallel. The default is 1 indicating single-threaded replication.
Number threads used to apply changes on active master data store	Number of threads used to apply changes on the active master database to the standby master database in an active standby pair replication scheme.
Optimization level used to compile PL/SQL library units	Optimization level used to compile PL/SQL library units.
Oracle Service Name of Oracle instance from which data is loaded	Oracle Service Name of the Oracle instance from which data is to be loaded into a TimesTen database.
PL/SQL memory segment size	Size in megabytes of the shared memory segment used by PL/SQL.

Table 6–3 (Cont.) Database Information

Database information	Description
Parallel replication apply ordering	Database attribute is `ReplicationApplyOrdering`. If 0 (the default), specifies commit ordering parallel replication. If 1, specifies user-managed track based parallel replication.
Query timeout threshold	Time limit in seconds that the database can execute a SQL statement before timing out.
RAM residence policy	Ram residence policy (always, manual, inUse).
Replication agent running	1 if running; 0 if not running.
Replication policy	Replication policy (always, manual, norestart).
Row-level or data store-level locking	Specifies whether the connection uses row-level locking (value = 0) or data store-level locking (value =1).
SQL statement pass through to Oracle mode	Specifies if SQL statements are passed through to Oracle, or executed locally in TimesTen, or both.
Sets the maximum message wait time	Sets the maximum message wait time.
Size in MB of the permanent partition of the data store	Size in megabytes of the permanent partition of the database.
Size in MB of the temporary partition of the data store	Size in megabytes of the temporary partition of the database.
Specifies that disk space should be preallocated when created	Specifies that disk space for the database should be preallocated when creating the database.
Specifies that the data store is not saved to disk	Specifies that database is not saved to disk.
Terminate connect if recovery encounters defective log record	Determines whether the first connection to the database should proceed if TimesTen recovery encounters a defective log record. If 1, TimesTen continues after log is truncated.
The collating sequence to use for linguistic comparisons	Collating sequence to use for linguistic comparisons. Default is binary.
The default length semantics configuration	Default length semantics configuration. Default is byte.
The directory where transaction log files are stored	The directory where transaction log files are stored.
The number of log buffer strands	Number of log buffer strands.
The number of threads used to rebuild indexes during recovery	Number of threads used to rebuild indexes during recovery.
The size of the internal log buffer in MB	Size of the internal log buffer in megabytes.
The transaction log file size in MB	Transaction log file size in megabytes.
The type mode for the data store	Type mode for database. If 0, Oracle type mode. If 1, TimesTen type mode.

Table 6–3 (Cont.) Database Information

Database information	Description
Threshold for warning when permanent partition low in memory	Threshold at which TimesTen returns a warning and throws an SNMP trap when the permanent partition of the database is low in memory.
Threshold for warning when temporary partition low in memory	Threshold at which TimesTen returns a warning and throws an SNMP trap when the temporary partition of the database is low in memory.
Time PL/SQL procedure can run before being terminated	Number of seconds a PL/SQL procedure runs before being automatically terminated.
Time of first connection to data store	Time of first connection to the database.
TimesTen or Oracle binding for dup occurrences of parameter	Determines whether applications use TimesTen or Oracle parameter binding for duplicate occurrences of a parameter in a SQL statement. If 0, Oracle-style binding.
What type of logging should be performed for the data store	Type of logging used for the database. Only logging to disk is supported (value = 1).
Whether PL/SQL compiler generates cross-reference information	Determines if PL/SQL compiler should generate cross-reference information.
Whether error returned if query times out before executing	Indicates whether TimesTen should write a warning to the support log and throw an SNMP trap when execution time of a SQL statement exceeds the specified value. If 0, TimesTen does not return a warning.
Whether real memory should be locked during data store load	Specifies whether connections to a shared database should lock real memory during database loading.
Whether to enable installation of TAF FAN callbacks	Specifies whether to enable or disable installation of Transparent Application Failover (TAF) and Fast Application Failover (FAB) callbacks when using Oracle Real Application Clusters (Oracle RAC) with TimesTen Cache.
Whether unneeded transaction log files deleted during checkpoint	If 1, transaction log files are deleted during a checkpoint operation.

Instance information

Table 6–4 shows information about your TimesTen instance.

Table 6–4 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 PID	TimesTen server process ID.
TimesTen server port number	Server port number.
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*.

Performance data

Table 6–5 shows performance information.

Table 6–5 Performance Data

Metric	Description
CACHE - Autorefresh cycles completed successfully on TimesTen	Number of autorefresh cycles completed successfully on TimesTen.
CACHE - Bytes loaded from Oracle DB due to dyn 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 from Oracle DB due to dynamic load misses	Total number of bytes loaded from the Oracle database for servicing dynamic load misses.
CACHE - Bytes sent to Oracle DB for SWT cache groups operations	Number of bytes sent to the Oracle database during SWT cache group operations.
CACHE - Data loads from Oracle DB servicing dynamic load misses	Number of data loads from the Oracle database when servicing dynamic load misses for dynamic local cache groups.
CACHE - Data requests due to dynamic load on remote grid member	Number of requests for data received by this grid member from another grid member (as a result of a dynamic load on the remote grid member).
CACHE - Data requests received where data not present	Number of requests for data received by this 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 grid member when the data requested was locked by a transaction on this member.
CACHE - Data requests received where the data requested is dirty	Number of requests for data received by this grid member when the data requested is dirty (and must first be propagated to the Oracle database).
CACHE - Delete batches sent to Oracle DB in SQL mode	Number of delete batches sent to the Oracle database in SQL mode (`CacheAWTMethod` = 0).
CACHE - Dynamic loads where not local but remote load ok	Dynamic loads that do not find data in the local grid member and successfully load the required data from another grid member.
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 grid member without requiring the data to be loaded from the Oracle database or another grid member.
CACHE - Global dynamic cachegroup cache misses	Global dynamic cache group misses: Dynamic loads that do not find data initially in the local grid member (either need to go to the Oracle database or another grid member).
CACHE - Insert batches sent to Oracle DB in SQL mode	Number of insert batches sent to the Oracle database in SQL mode (`CacheAWTMethod` = 0).

Table 6–5 (Cont.) Performance Data

Metric	Description
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 - Number of AWT transactions committed on Oracle DB	Number of AWT transactions committed on the Oracle database.
CACHE - Number of PL/SQL block batches sent to Oracle DB	Number of PL/SQL block batches sent to the Oracle database. (`CacheAWTMethod` = 1).
CACHE - Number of autorefresh cycles that failed due to errors	Number of autorefresh cycles that failed because of errors.
CACHE - Number of batches sent to Oracle DB in SQL mode	Number of batches sent to the Oracle database in SQL mode (`CacheAWTMethod` = 0).
CACHE - Number of bytes flushed to Oracle DB	Number of bytes flushed to the Oracle database.
CACHE - Number of bytes sent to Oracle DB in PL/SQL mode	Number of bytes sent to the Oracle database in PL/SQL mode (`CacheAWTMethod` = 1).
CACHE - Number of bytes sent to Oracle DB in SQL mode	Number of bytes sent to the Oracle database in SQL mode (`CacheAWTMethod` = 0).
CACHE - Number of calls made to Oracle DB for AWT	Number of calls made to the Oracle database for AWT.
CACHE - Number of flush cache group executes	Number of flush cache group executions.
CACHE - Number of rollbacks on Oracle DB because of errors	Number of rollbacks on Oracle database because of errors.
CACHE - Number of rows deleted on Oracle DB in PL/SQL mode	Number of rows deleted from Oracle database in PL/SQL mode (`CacheAWTMethod` = 1).
CACHE - Number of rows deleted on Oracle DB in SQL mode	Number of rows deleted from the Oracle database in SQL mode (`CacheAWTMethod` = 0).
CACHE - Number of rows flushed to Oracle DB	Number of rows flushed to the Oracle database.
CACHE - Number of rows in SWT cache groups deleted on Oracle DB	Number of rows in SWT cache groups deleted from Oracle database.
CACHE - Number of rows in SWT cache groups inserted on Oracle DB	Number of rows in SWT cache groups inserted into Oracle database.
CACHE - Number of rows in SWT cache groups updated on Oracle DB	Number of rows in SWT cache groups updated on Oracle database.

Table 6–5 (Cont.) Performance Data

Metric	Description
CACHE - Number of rows inserted on Oracle DB in PL/SQL mode	Number of rows inserted into Oracle database in PL/SQL mode (`CacheAWTMethod` = 1).
CACHE - Number of rows updated on Oracle DB in PL/SQL mode	Number of rows updated on Oracle database in PL/SQL mode (`CacheAWTMethod` = 1).
CACHE - Rows deleted in TimesTen by autorefresh from Oracle DB	Number of rows deleted from TimesTen during autorefresh from the Oracle database.
CACHE - Rows inserted in TimesTen by autorefresh from Oracle DB	Number of rows inserted into TimesTen during autorefresh from the Oracle database.
CACHE - Rows inserted on Oracle DB in SQL mode	Number of rows inserted into Oracle database in SQL mode (`CacheAWTMethod` = 0).
CACHE - Rows updated in TimesTen by autorefresh from Oracle DB	Number of rows updated in TimesTen during autorefresh from the Oracle database.
CACHE - Rows updated on Oracle DB in SQL mode	Number of rows updated on Oracle database in SQL mode (`CacheAWTMethod` = 0).
CACHE - Times AWT transactions re-tried in case of an error	Number of times AWT transactions are re-tried on Oracle database.
CACHE - Times dynamic load miss load from Oracle DB	Number of times a dynamic load miss had to load the requested data from the Oracle database.
CACHE - TimesTen transactions propagated to Oracle DB	Number of TimesTen transactions propagated to the Oracle database.
CACHE - Update batches sent to Oracle DB in SQL mode	Number of updated batches sent to the Oracle database in SQL mode (`CacheAWTMethod` = 0).
CKPT - Bytes written during last checkpoint	Number of bytes written during last checkpoint.
CKPT - End time of last checkpoint begun	End time of last checkpoint begun.
CKPT - Number of bytes of checkpoint files written	Number of bytes written for checkpointing.
CKPT - Number of checkpoint bytes written during DB recovery	Number of bytes written for checkpointing during database recovery.
CKPT - Number of checkpoint writes	Number of checkpoint writes.
CKPT - Number of checkpoints completed	Number of checkpoints completed.
CKPT - Number of fuzzy checkpoints completed	Number of fuzzy checkpoints completed.
CKPT - Start time of last checkpoint begun	Start time of last checkpoint begun.

Table 6–5 (Cont.) Performance Data

Metric	Description
CKPT - Status of last checkpoint begun	Status of last checkpoint begun. For instance, completed.
CKPT - Type of last checkpoint begun	Type of last checkpoint begun. For example, fuzzy.
CKPT - Whether last checkpoint begun had an error	Whether last checkpoint begun had an error.
CONNECTIONS - DB connects exceeding configured number of conns	Cumulative number of database connection thresholds exceeded.
CONNECTIONS - Number of client-server connections established	Cumulative number of client/server connections established.
CONNECTIONS - Number of database connects established	Cumulative number of database connections established.
CONNECTIONS - Number of database disconnects	Cumulative number of database disconnections.
CONNECTIONS - Number of direct linked DB conns established	Cumulative number of direct-linked database connections established.
CONNECTIONS - Number of first database connections established	Number of first database connections established.
CS - Number of ALTER statements executed by server	Number of `ALTER` statements executed by server.
CS - Number of CREATE statements executed by server	Number of `CREATE` statements executed by server.
CS - Number of DELETE statements executed by server	Number of `DELETE` statements executed by server.
CS - Number of DROP statements executed by server	Number of `DROP` statements executed by server.
CS - Number of INSERT statements executed by server	Number of `INSERT` statements executed by server.
CS - Number of MERGE statements executed by server	Number of `MERGE` statements executed by server.
CS - Number of SELECT statements executed by server	Number of `SELECT` statements executed by server.
CS - Number of UPDATE statements executed by server	Number of `UPDATE` statements executed by server.
CS - Number of client/server bytes received by server	Number of client/server bytes received by server.

Table 6–5 (Cont.) Performance Data

Metric	Description
CS - Number of client/server bytes transmitted by server	Number of client/server bytes transmitted by server.
CS - Number of client/server disconnects	Number of client/server disconnects.
CS - Number of client/server round trips	Number of client/server roundtrips.
CS - Number of table rows deleted by server	Number of table rows deleted by server.
CS - Number of table rows inserted by server	Number of table rows inserted by server.
CS - Number of table rows updated by server	Number of table rows updated by server.
CS - Number of transaction rollbacks by server	Number of transaction rollbacks by server.
CS - Number of transactions committed by server	Number of transactions committed by server.
DB - Inserts into hash indexes during DB recovery index rebuild	Number of rows inserted into hash indexes during index rebuild phase of database recovery.
DB - Inserts into range indexes during DB recovery index rebuild	Number of rows inserted into range indexes during index rebuild phase of database recovery
DB - Number of LRU aging commits done since db loaded	Number of LRU aging commits since the data store was loaded into memory.
DB - Number of LRU aging cycles completed since db loaded	Number of LRU aging cycles completed since the data store was loaded into memory.
DB - Number of deletes from range indexes	Number of rows deleted from range indexes.
DB - Number of full table scans	Number of full table scans.
DB - Number of hash indexes scanned	Number of hash indexes scanned.
DB - Number of hash indexes scanned during replication ops	Number of hash indexes scanned during replication operations (such as insert, update, and delete operations on tables).
DB - Number of indexes rebuilt	Number of indexes rebuilt.
DB - Number of inserts into range indexes	Number of rows inserted into range indexes.
DB - Number of merge joins done	Number of merge joins done.
DB - Number of nested loop joins done	Number of nested loop joins done.
DB - Number of range indexes scanned	Number of temporary indexes scanned.

Table 6–5 (Cont.) Performance Data

Metric	Description
DB - Number of rows deleted during LRU aging since db loaded	Number of rows deleted during LRU aging since the data store was loaded into memory.
DB - Number of rows deleted from hash indexes	Number of rows deleted from hash indexes.
DB - Number of rows fetched from hash indexes	Number of rows fetched from hash indexes.
DB - Number of rows fetched from temporary indexes	Number of rows fetched from temporary indexes.
DB - Number of rows inserted into hash indexes	Number of rows inserted into hash indexes.
DB - Number of sorts done	Number of sorts done.
DB - Number of table rows deleted	Number of table rows deleted.
DB - Number of table rows inserted	Number of table rows inserted.
DB - Number of table rows read	Number of table rows read.
DB - Number of table rows updated	Number of table rows updated.
DB - Number of temporary indexes created	Number of temporary indexes created.
DB - Number of temporary indexes scanned	Number of range indexes scanned.
DB - Number of time-based aging commits done since the db loaded	Number of time-based aging commits since the data store was loaded into memory.
DB - Number of tuples fetched from range indexes	Number of rows fetched from range indexes.
DB - Number of updates on range indexes	Number of rows updated on range indexes.
DB - Number rows deleted during time-based aging since db loaded	Number of rows deleted during time-based aging since the data store was loaded into memory.
DB - Number temp indexes scanned during replication operations	Number of range indexes scanned during replication operations (such as insert, update, and delete operations on tables).
DB - Number time-based aging cycles completed since db loaded	Number of time-based aging cycles completed since the data store was loaded into memory.
DB - Number times LRU aging high threshold rchd since db loaded	Number of times LRU aging high threshold has been reached since the data store was loaded into memory.
DB - Number times LRU aging low threshold rchd since db loaded	Number of times LRU aging low threshold has been reached since the data store was loaded into memory.

Table 6–5 (Cont.) Performance Data

Metric	Description
DB - Range indexes scanned during replication operations	Number of temporary indexes scanned during replication operations.
DB - Rows fetched from hash indexes during replication ops	Number of rows fetched from hash indexes during replication operations.
DB - Rows fetched from range indexes during replication ops	Number of rows fetched from range indexes during replication operations.
DB - Rows fetched from temp indexes during replication ops	Number of rows fetched from temporary indexes during replication operations.
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 data store 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 data store was loaded into memory.
GRID - Number of detach operations	Number of detach operations.
GRID - Number of grid members that have attached so far	Number of attach operations.
LOCK - Number of deadlocks	Number of deadlocks.
LOCK - Number of lock requests denied due to timeouts	Number of lock requests denied due to timeouts.
LOCK - Number of locks acquired for DML activity	Number of locks acquired for DML activity.
LOCK - Number of locks acquired for table scans	Number of locks acquired for table scans.
LOCK - Number of locks granted immediately	Number of locks granted immediately.
LOCK - Number of locks granted that required waiting	Number of locks granted that required waiting.
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 for commits	Number of file system reads from the log for commit processing.
LOG - Last log file number	Number of last log file.
LOG - Most recent log file present	Most recent log file present.
LOG - Number of bytes inserted into the log buffer	Number of bytes inserted into the log buffer.

Table 6–5 (Cont.) Performance Data

Metric	Description
LOG - Number of bytes of log read during DB recovery	Number of log bytes read during database recovery.
LOG - Number of file system reads	Number of file system reads.
LOG - Number of file system writes	Number of file system writes.
LOG - Number of log files generated so far	Number of log files generated so far.
LOG - Number of log records inserted into the log buffer	Number of log records inserted into the log buffer.
LOG - Number of 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 partition in use - MB	Highest amount of permanent data partition memory in use since the first connection to the database.
MEMORY - Highest amount of temporary partition in use - MB	Highest amount of temporary data partition memory in use since the first connection to the database.
MEMORY - MB of permanent space in use	Size of permanent partition currently in use.
MEMORY - MB of temporary space in use	Size of temporary partition currently in use.
MEMORY - Percent of permanent space in use	Percent of the permanent partition space currently being used.
MEMORY - Percent of temporary space in use	Percent of the temporary partition space currently being used.
PLSQL - Number of times PL/SQL object's handle found in memory	Number of times a PL/SQL object's handle was found in memory.
PLSQL - Number of times a PIN was requested for PL/SQL objects	Number of times a PIN was requested for PL/SQL objects.
PLSQL - Number of times lock requested for a PL/SQL object	Number of times a lock was requested for a PL/SQL object.
PLSQL - PINs of objs not 1st performed since obj handle created	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.
PLSQL - Ratio of ttplsql_GetHits to ttplsql_Gets	Ratio of GetHits to Gets.
PLSQL - Ratio of ttplsql_PinHits to ttplsql_Pins	Ratio of PinHits to Pins.

Table 6–5 (Cont.) Performance Data

Metric	Description
PLSQL - Times all metadata pieces of library obj found in mem	Number of times all of the metadata pieces of the library object were found in memory.
PLSQL - Times objs marked invalid because dependent obj modified	Total number of times objects in the namespace were marked invalid because a dependent object was modified.
PLSQL - Total heap (MB) allocated to PL/SQL on this DB conn	Total amount of heap memory in megabytes allocated to PL/SQL for the database connection.
PLSQL - Total number of times a deferred cleanup occurred	Number of times a deferred cleanup occurred.
REP - Last log file number held by replication	Number of last log file held by replication.
REP - Number of xacts replicated from this database	Number of replicated transactions generated on the local database that are being replicated to at least one peer database.
STMT - Number of ALTER statements executed	Number of `ALTER` statements executed.
STMT - Number of CREATE statements executed	Number of `CREATE` statements executed.
STMT - Number of DELETE statements executed	Number of `DELETE` statements executed.
STMT - Number of DROP statements executed	Number of `DROP` statements executed.
STMT - Number of INSERT statements executed	Number of `INSERT` statements executed.
STMT - Number of MERGE statements executed	Number of `MERGE` statements executed.
STMT - Number of SELECT statements executed	Number of `SELECT` statements executed.
STMT - Number of UPDATE statements executed	Number of `UPDATE` statements executed.
STMT - Number of automatic statement reprepares	Number of automatic statement reprepares.
STMT - Number of cmd cache misses during statement prepare	Number of command cache misses during statement prepare.
STMT - Number of statement prepares	Number of statement prepares.
STMT - Number of statement reprepares (forced or automatic)	Number of statement reprepares including forced and automatic.
STMT - Total number of SQL statements executed	Number of SQL statements executed.

Table 6–5 (Cont.) Performance Data

Metric	Description
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.
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.

Table 6–5 (Cont.) Performance Data

Metric	Description
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 - Communication with Oracle DB for dynamic load	Number of executes from Oracle DB using dynamic load.
WORKLOAD - Direct linked connections	The number of current direct-linked connections on the database.
WORKLOAD - Fetches from Oracle DB using dynamic load	Number of fetches from Oracle DB 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 - Number of commands prepared	Number of commands prepared (compiled).
WORKLOAD - Number of commands reprepared	Number of commands reprepared.
WORKLOAD - Number of cursor opens	Number of cursor opens.
WORKLOAD - Number of cursors closed	Number of cursor closed.
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.
WORKLOAD - Total number of connections	Sum of all current active connections on the TimesTen database.
XACT - Number of XLA initiated transaction commits	Number of XLA initiated transaction commits.
XACT - Number of durable replicated transaction commits	Number of durable replicated transaction commits.
XACT - Number of durable transaction commits	Number of durable transaction commits.
XACT - Number of nondurable replicated transaction commits	Number of nondurable replicated transaction commits.
XACT - Number of nondurable transaction commits	Number of nondurable transaction commits.

Table 6–5 (Cont.) Performance Data

Metric	Description
XACT - Number of replication initiated transaction commits	Number of replication initiated transaction commits.
XACT - Number of transaction rollbacks	Number of transaction rollbacks.
XACT - Number of transactions committed	Number of durable and non-durable transaction committed.

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 past minute or the per-minute rate (if you have changed the most recent collection interval to a value other than one minute).

Table 6–6 shows each metric and provides a description for the metric.

Table 6–6 Performance Rates

Metric	Description
CACHE - Rows per batch in PLSQL mode	Rows per batch in PL/SQL mode.
CACHE - Rows per batch in SQL mode	Rows per batch in SQL mode.
CACHE - Total AWT MB per sec	Megabytes per second sent to the Oracle database.
CACHE - Transactions committed on Oracle DB per sec	Transactions committed on the Oracle database per second.
CACHE - Transactions propagated to Oracle DB per sec	Transactions propagated to the Oracle database per second.
CS - Client/server bytes received by server per sec	Number of client/server bytes received by server per second.
CS - Client/server bytes transmitted by server per sec	Number of client/server bytes transmitted by server per second.
CS - Client/server round trips per sec	Number of client/server roundtrips per second.
CS - SELECT statements executed by server per sec	Number of `SELECT` statements executed by server per second.
CS - Table rows deleted by server per sec	Number of table rows deleted by server per second.
CS - Table rows inserted by server per sec	Number of table rows inserted by server per second.
CS - Table rows updated by server per sec	Number of table rows updated by server per second.
CS - Transaction rollbacks by server per sec	Number of transaction rollbacks by server per second.

Table 6–6 (Cont.) Performance Rates

Metric	Description
CS - Transactions committed by server per sec	Number of transactions committed by server per second.
DB - Table rows deleted per minute	Table rows deleted per minute.
DB - Table rows inserted per minute	Table rows inserted per minute.
DB - Table rows read per minute	Table rows read per minute.
DB - Table rows updated per minute	Table rows updated per minute.
GRID - Cache Grid attaches per minute	Cache grid attaches per minute.
GRID - Cache Grid detaches per minute	Cache grid detaches per minute.
GRID - Cache Grid global hit percent	Cache grid global hit percent (percent is found in local grid member).
GRID - Cache Grid global hits per sec	Cache grid global hits per second.
GRID - Cache Grid global misses per sec	Cache grid global misses per second.
GRID - Cache Grid local hits per sec	Cache grid local hits per second.
GRID - Cache Grid local misses per sec	Cache grid local misses per second.
GRID - Cache Grid misses filled from Oracle DB per sec	Cache grid misses filled from the Oracle database per second.
LOCK - Deadlocks per minute	Number of deadlocks per minute.
LOCK - Immediate lock grants per minute	Number of non-blocking locks acquired per minute.
LOCK - Lock grants after wait per minute	Number of blocking locks acquired per minute.
LOCK - Lock timeouts per minute	Number of lock timeouts per minute.
LOCK - Percent locks granted immediately	Percent of locks granted immediately versus having to wait.
LOG - Log buffer MB inserted per sec	Number of megabytes inserted into the log buffer per second.
LOG - Log buffer waits per minute	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	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	Number of times per minute a log read could not be satisfied from the in memory buffer.

Table 6–6 (Cont.) Performance Rates

Metric	Description
Prepares per minute to executes per minute ratio	Ratio of the prepares per minutes to executes per minute.
REP - Transactions replicated per minute	Number of transactions replicated to a peer per minute.
STMT - DELETE statements executed per sec	Number of `DELETE` statements executed per second.
STMT - INSERT statements executed per sec	Number of `INSERT` statements executed per second.
STMT - MERGE statements executed per sec	Number of `MERGE` statements executed per second.
STMT - SELECT statements executed per sec	Number of `SELECT` statements executed per second.
STMT - Total number of statements executed per sec	Total number of statements executed per second.
STMT - UPDATE statements executed per sec	Number of `UPDATE` statements executed per second.
WORKLOAD - Connects per minute	Number of connections to the database per minute.
WORKLOAD - Disconnects per minute	Number of disconnections to the database per minute.
WORKLOAD - Number of commands prepared per minute	Number of SQL commands prepared (compiled) per minute.
WORKLOAD - Number of commands reprepared per minute	Number of SQL commands reprepared (recompiled) per minute.
WORKLOAD - Number of queries per second	Number of queries per second.
XACT - Transaction rollbacks per sec	Number of transactions rolled back per second.
XACT - Transactions committed per second	Number of transactions committed per second.
XACT - Transactions durably committed per second	Number of durable transactions committed per minute.

Replication peers

Table 6–7 shows replication peers metrics and provides a description of the metric.

Table 6–7 Replication Peers

Metric	Description
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.
Replication host name	Name of the machine that hosts replication.

Table 6–7 (Cont.) Replication Peers

Metric	Description
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.
Type	Type.

Replication status

Table 6–8 shows replication status information.

Table 6–8 Replication Status

Name	Description
Replication peer name	Replication peer name.
Replication thread type	Replication thread type. Valid values are Transmitter or Receiver.
Start or restart count	Start or restart count.
Transactions sent or received	Transactions sent or received.

Replication subscribers

Table 6–9 shows replication subscriber information.

Table 6–9 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 acknowledgement 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 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 host name	Name of the machine 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 track	Replication track.

Table 6–9 (Cont.) Replication Subscribers

Name	Description
Txn log files held by the master database for a subscriber	Number of transaction log files the master database is retaining for a subscriber.

Response

Table 6–10 shows response information.

Table 6–10 Response

Name	Description
Response time (sec)	The time taken for the plug-in to query the TimesTen `SYS.MONITOR` table.
Status	Valid values are Up or Down.

SQL command cache

Table 6–11 describes information in the SQL command cache.

Table 6–11 SQL Command Cache

Name	Description
Executions which took place on this command	A counter for the number of executions that took place on this command since it was brought into the command cache.
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.
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.
Space (bytes) allocated for this command in the command cache	The total space in bytes allocated for this command in the command cache.
Unique ID of a private connection	Unique ID 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.

Transaction log holds

Table 6–12 shows transaction log holds information.

Table 6–12 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.

7

Working with the Replication Monitor

This chapter describes the replication monitor page. The replication monitor page allows you to monitor and analyze TimesTen targets 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, make sure you have configured replication for your TimesTen target and make sure the replication agent is up.

Navigate to 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 IMDB** menu, select **Additional Links**, 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
- Aggregates

The bottom area consists of:

- Replication peers
- Replication log holds
- Transmitter threads status
- Receiver threads status
- Performance

Summary

Figure 7–1 Replication summary

This region identifies your database and the configuration of your database, including:

- Datastore name

  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/rep_masterdb1`, the datastore name is `rep_masterdb1`.

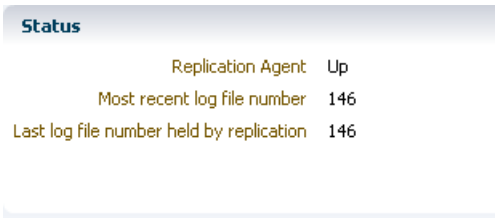
- Hostname

  The name of the host where TimesTen is running.

- Port
- Replication policy

Status

Figure 7–2 Replication status

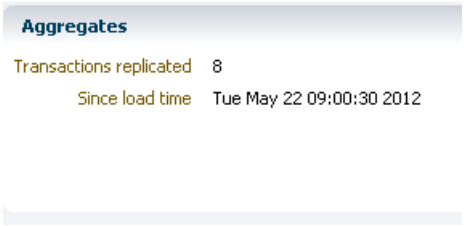


The replication status area shows overall information relative to the current state of the replicated operations. If the most recent log file number is much greater than the last log file held by replication, then the replication agent has fallen behind in transmitting the recently created transactions.

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

Aggregates

Figure 7–3 Replication aggregates

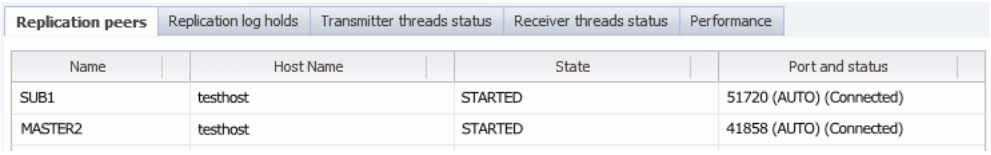


This region shows the total number of replicated transactions from the database since the time the database was loaded into memory.

Replication peers

Choose the **Replication peers** tab.

Figure 7–4 Replication peers

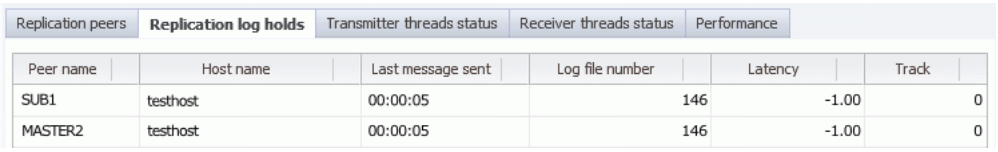


The replication peers table is common to any database regardless of whether the database is in the role of transmitter or receiver. The table shows the list of peers to the database.

Replication log holds

Choose the **Replication log holds** tab.

Figure 7–5 Replication log holds

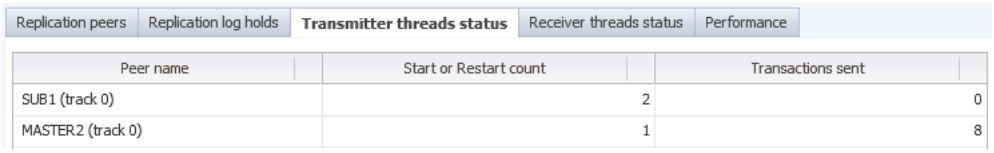


The replication log holds table shows information for databases that replicate transactions to other databases. The table shows replication log holds.

Transmitter threads status

Choose the **Transmitter threads status** tab in the middle of the page.

Figure 7–6 Transmitter threads status

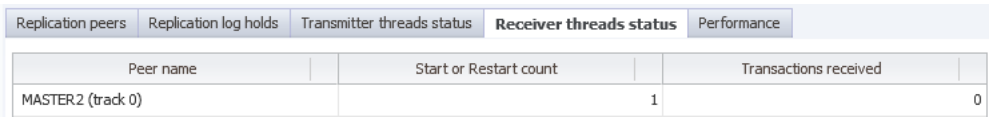


The transmitter threads status table shows information for databases that replicate transactions to other databases. The table shows the status of transmitter threads for the database.

Receiver threads status

Choose the **Receiver threads status** tab.

Figure 7–7 Receiver threads status

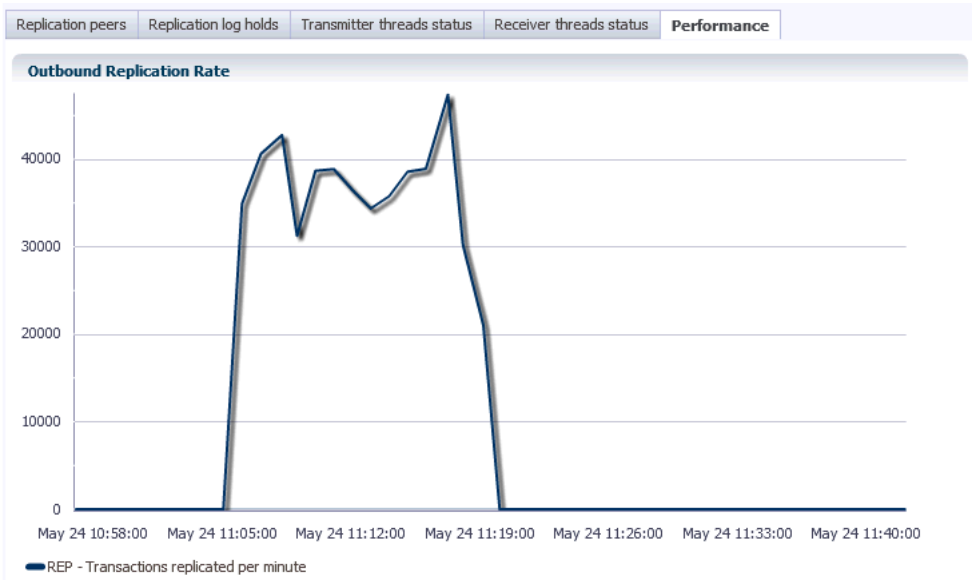


The receiver threads status table shows information for databases that receive transactions from other databases. The table shows the status of receiver threads for the database.

Performance

Choose the **Performance** tab.

Figure 7–8 Replication performance



This region uses a line graph to show the outbound replication rate of transactions replicated per minute.

The X-Axis represents Time. The Y-Axis represents the number of transactions replicated per minute.

8

Viewing Reports

Reports are generated from the metric information that has been collected and stored in the Oracle Enterprise Manager Cloud Control repository.

Topics include:

- Viewing reports
- Types of reports

Viewing reports

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

1. From the **TimesTen IMDB** menu, select **TimesTen IMDB**, then select **Information Publisher Reports**.

   The Information Publisher Reports page displays. Locate the Title column in the Information Publisher Reports table.

2. In the Title column, click the **name of the TimesTen report**.

   The Specify Target for Report page displays.

3. Click **Continue**.

   The report displays. If you wish to print the report, choose **Printable Page**.

Types of reports

There are nine report categories containing 10 groups of reports.

The categories, groups, and subgroups are:

- **TimesTen Cache Grid Reports**
  - **TimesTen Cache AWT Activity Reports**
    - AWT Commits
    - AWT Rows per Batch
    - AWT Throughput
  - **TimesTen Cache Grid Activity Reports**
    - Cache Grid Global Hit Percent
    - Cache Grid Attaches and Detaches

        * Cache Grid Hits and Misses
- **TimesTen Connections**
  - **TimesTen IMDB Connections Reports**
    * Current Connections
    * Connection Rate
- **TimesTen IMDB Monitoring**
  - **TimesTen IMDB Activity Reports**
    * Log Activity
    * Transactions Activity
    * Space Usage (% full)
    * Log Buffer Bytes
- **TimesTen Lock Reports**
  - **TimesTen IMDB Lock Activity Reports**
    * Locks Granted Immediately vs Wait
    * Locks Timeouts and Deadlocks
- **TimesTen Log Monitoring**
  - **TimesTen IMDB Transaction Log Reports**
    * Log Inserts Activity
    * Log Waits Activity
    * Completed Checkpoints
    * Checkpoint Bytes Written Activity
    * Recovery Activity
- **TimesTen Memory Monitoring**
  - **TimesTen IMDB Memory Reports**
    * Permanent Memory Activity
    * Temporary Memory Activity
    * PL/SQL Memory Activity
- **TimesTen PLSQL Reports**
  - **TimesTen IMDB PLSQL Reports**
    * Pin Hit Ratio
    * PL/SQL Invalidations and Reloads
- **TimesTen SQL Operations**
  - **TimesTen IMDB SQL Operation Reports**
    * SQL Operations
- **TimesTen Tables**
  - **TimesTen IMDB Table Activity Reports**
    * Rows Processed

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