Monitoring Oracle

Oracle: Database PowerPack version 100, rev. 1

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Chapter 1

Introduction

Overview

This manual describes how to configure SL1 to monitor Oracle Database instances.

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What is Oracle Database?

Oracle Database is a multi-model database management system used for running online transaction processing, data warehousing, and mixed database workloads.

What Does the Oracle: Database PowerPack Monitor?

The *Oracle: Database* PowerPack includes Dynamic Applications that can monitor performance metrics and collect configuration data for Oracle databases and their instances.

In addition to Dynamic Applications, the PowerPack includes the following features:

- Dynamic Applications to discover, model, and monitor performance metrics and collect configuration data for Oracle Database instances
- Event Policies and corresponding alerts that are triggered when Oracle devices meet certain status criteria

- Device Classes for each of the Oracle devices monitored
- Sample Credentials for discovering Oracle devices
- A Device Dashboard to display summary information about an Oracle Database instance

Installing the Oracle: Database PowerPack

Before completing the steps in this manual, you must import and install the latest version of the *Oracle: Database* PowerPack.

If you have the *SLPS: Oracle DB* PowerPack or the *Oracle DB* PowerPack installed, you must remove them from your SL1 system.

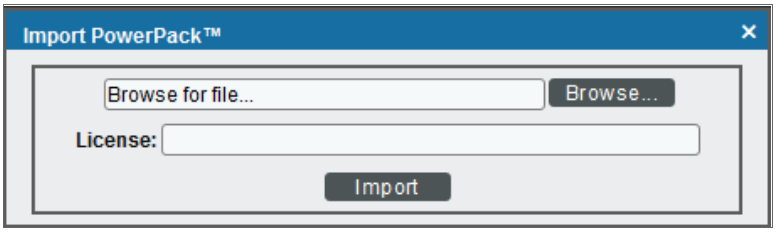
You must also remove any pre-existing discovered Oracle Database device trees and all Oracle device classes before installing.

NOTE: If you are upgrading from an earlier version of the PowerPack, see the Release Notes for the version you are installing for upgrade instructions.

TIP: By default, installing a new version of a PowerPack overwrites all content from a previous version of that PowerPack that has already been installed on the target system. You can use the ***Enable Selective PowerPack Field Protection*** setting in the **Behavior Settings** page (System > Settings > Behavior) to prevent new PowerPacks from overwriting local changes for some commonly customized fields. (For more information, see the ***System Administration*** manual.)

To download and install a PowerPack:

1. Download the PowerPack from the ScienceLogic Customer Portal.
2. Go to the **PowerPack Manager** page (System > Manage > PowerPacks).
3. In the **PowerPack Manager** page, click the **[Actions]** button, then select *Import PowerPack*.
4. The **Import PowerPack** dialog box appears:



5. Click the **[Browse]** button and navigate to the PowerPack file.
6. When the **PowerPack Installer** modal appears, click the **[Install]** button to install the PowerPack.

NOTE: If you exit the **PowerPack Installer** modal without installing the imported PowerPack, the imported PowerPack will not appear in the **PowerPack Manager** page. However, the imported PowerPack will appear in the **Imported PowerPacks** modal. This page appears when you click the **[Actions]** menu and select *Install PowerPack*.

Chapter 2

Configuring Oracle Monitoring

Overview

The following sections describe how to configure and discover your Oracle Database instances for monitoring by SL1 using the *Oracle: Database* PowerPack:

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Prerequisites for Monitoring Oracle Database Instances

To configure the SL1 system to monitor Oracle Database instances using the *Oracle: Database* PowerPack, you must first have the following prerequisites and permissions:

- The Oracle database user must have access the following privileges:
    - sys_privileges: GRANT CREATE SESSION
    - role_privileges: GRANT SELECT_CATALOG_ROLE
    - tan_privileges: GRANT SELECT ON SYS.V_$DIAG_ALERT_EXT, GRANT SELECT ON SYS.TS$
- The Oracle database user must have access to the following tables:
    - all_tables
    - dba_data_files
    - dba_free_space
    - dba_registry
    - dba_scheduler_jobs_broken
    - dba_scheduler_jobs_failed
    - dba_tablespaces
    - dba_temp_files
    - gv$sort_segment
    - sessions_info
    - sys.dba_ind_partitions
    - sys.dba_ind_subpartitions
    - sys.dba_indexes
    - sys.dba_objects
    - sys.v_$database_block_corruption
    - v$archive_dest
    - v$archived_log
    - v$block_change_tracking
    - v$controlfile
    - v$database
    - v$datafile
    - v$datafile_header
    - v$diag_alert_ext
    - v$dispatcher
    - v$latch

    - v$librarycache
    - v$log
    - v$log_history
    - v$logfile
    - v$open_cursor
    - v$parameter
    - v$resource_limit
    - v$rollstat
    - v$rowcache
    - v$session
    - v$sesstat
    - v$statname
    - v$sysstat
    - v$tablespace
    - v$tempfile
    - v$version
- If you are monitoring an RAC system, the user must have access to the following:
    - v$asm_diskgroup
    - v$recovery_file_dest
- The Oracle database user must have permission to alter sessions.

Configuring Oracle Credentials

To monitor Oracle Database instances using SL1, you must create two credentials. The types of credentials that are required for monitoring depend on the type of server that is hosting the Oracle Database:

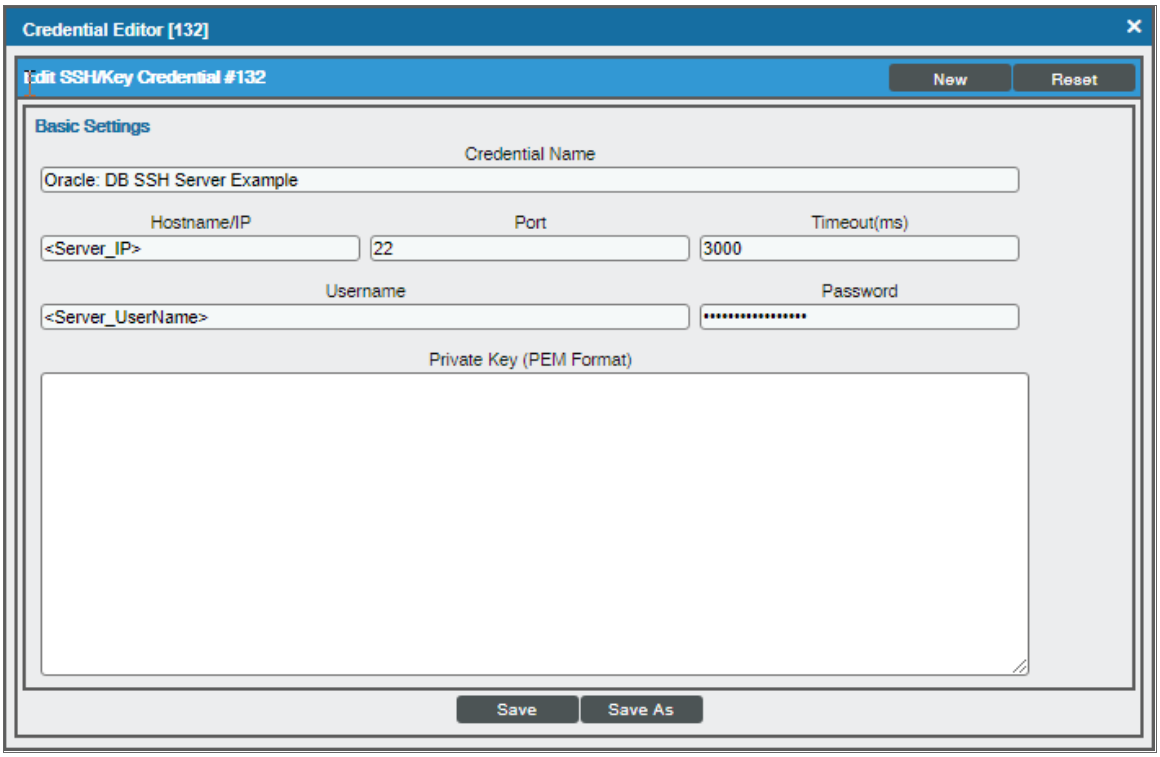
- Linux and Unix users must use an *SSH/Key credential* and a *SOAP/XML credential*
- Windows users must use a *PowerShell credential* and a *SOAP/XML credential*

Creating an SSH/Key Credential (Linux Users)

Linux and Unix users must create an SSH/Key credential.

To create an SSH/Key credential :

1. Go to the **Credential Management** page (System > Manage > Credentials).
2. Click the wrench icon ( ) for the "Oracle: DB SSH Server Example" credential. The **Credential Editor** modal page appears:



3. Supply values in the following fields:

   - ***Credential Name***. Type a new name for the credential.
   - ***Hostname/IP.*** Type the IP address for the Linux server that is hosting the Oracle Database.
   - ***Port***. Type 22.
   - ***Username***. Type the username for the Linux server that is hosting the Oracle Database.
   - ***Password***. Type the password for the Linux server that is hosting the Oracle Database.

4. Click the **[Save As]** button.
5. When the confirmation message appears, click **[OK]**.

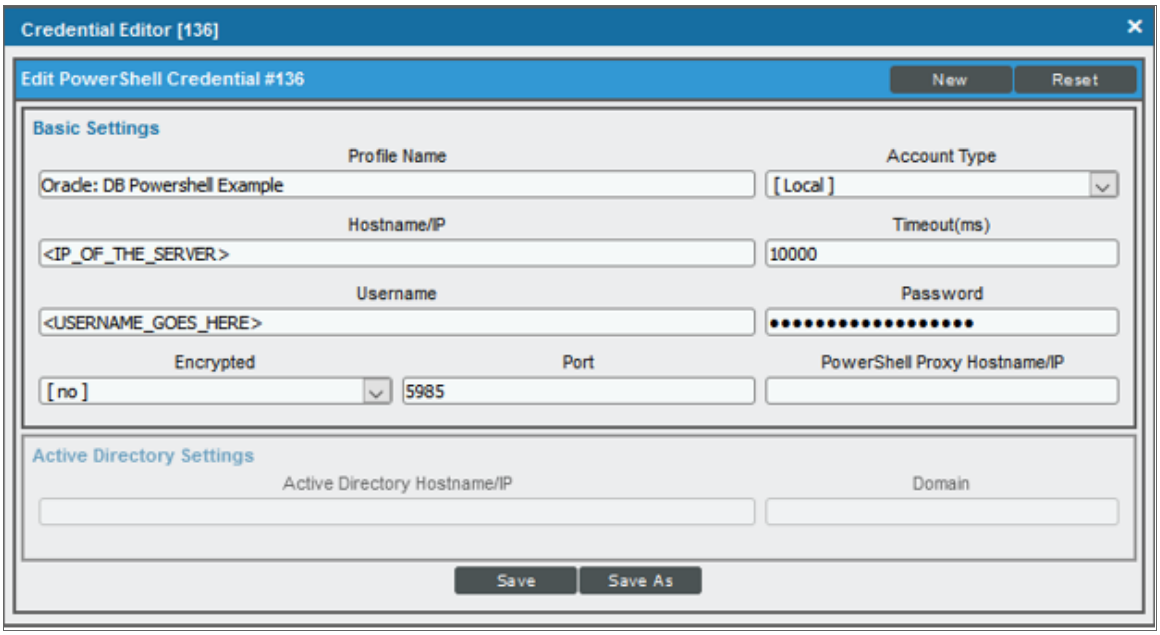
> **NOTE:** The credential ID will appear at the top of the window after it has been saved. Take note of the ID as you will need it when creating the SOAP/XML credential.

Creating a PowerShell Credential (Windows Users)

Windows users must create a PowerShell credential.

To create a PowerShell credential:

1. Go to the **Credential Management** page (System > Manage > Credentials).
2. Click the wrench icon ( ) for the "Oracle: DB Powershell Example" credential. The **Credential Editor** modal page appears:



3. Supply values in the following fields:

   - ***Profile Name***. Type a new name for the credential.
   - ***Account Type***. Select *Local*. Servers that are part of an Active Directory are not supported.
   - ***Hostname/IP***. Type the IP address of the server that is hosting the Oracle Database.
   - ***Timeout (ms)***. Type the time, in milliseconds, after which SL1 will stop trying to collect data from the authenticating server. For collection to be successful, SL1 must connect to the authenticating server, execute the PowerShell command, and receive a response within the amount of time specified in this field.
   - ***Username***. Type the username for the Windows server that is hosting the Oracle Database.
   - ***Password***. Type the password for the Windows server that is hosting the Oracle Database.
   - ***Encrypted***. Select whether SL1 will communicate with the device using an encrypted connection. Choices are:
     - *yes*. When communicating with the Windows server, SL1 will use a local user account with authentication of type "Basic Auth". You must then use HTTPS and can use a Microsoft Certificate or a self-signed certificate.
     - *no*. When communicating with the Windows server, SL1 will not encrypt the connection.
   - ***Port***. Type 5985 (http) or 5986 (https).
   - ***PowerShell Proxy Hostname/IP***. Leave this field blank.

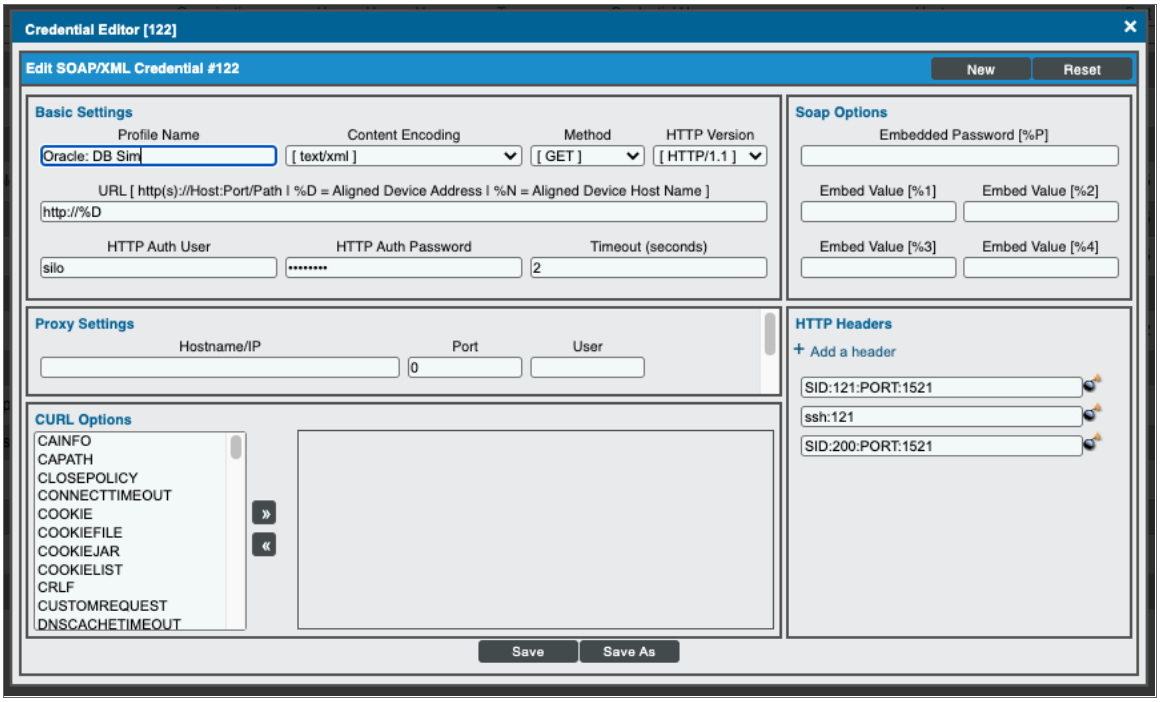
4. Click the **[Save As]** button.

> **NOTE:** The credential ID will appear at the top of the window after it has been saved. Take note of the ID as you will need it when creating the SOAP/XML credential.

Creating a SOAP/XML Credential

To create the SOAP/XML credential:

1. Go to the **Credential Management** page (System > Manage > Credentials).
2. Click the wrench icon ( ) for either the "Oracle: DB Example" credential for Windows users. The **Credential Editor** modal page appears:



3. Update the values in the following fields:

Basic Settings

- ***Profile Name***. Type a new name for the credential.
- ***URL***. Leave the default value of https://%D.
- ***HTTP Auth User***. Type the username for the Oracle Database account.
- ***HTTP Auth Password***. Type the password for the Oracle Database account.

NOTE: Discovering multiple instances on a single database server is supported, but all instances must share the same credentials entered in the SOAP/XML credential's ***HTTP Auth User*** and ***HTTP Auth Password*** fields.

HTTP Headers

- ***HTTP Headers***. Add the following headers by clicking ***+ Add a header***. A header should be added for each Oracle Database instance you are monitoring:
  - `SID: <Oracle Instance SID>:PORT<Oracle Instance Port that is listening for DB requests>`. For example:

    ```
    SID:SL121:PORT:22
    ```

    For ASM instances, add "ASM" as the SID value. For example:

    ```
    SID:+ASM:PORT:1521
    ```

NOTE: Only the SIDs listed in the credential will be discovered.

NOTE: For ASM instances, all Dynamic Applications (except the RAC Dynamic Applications) will be aligned to the instance but will show "NO DATA".

  - `<OS_TYPE>:<CRED_ID>`. The OS type and ID of the SSH/Key credential or PowerShell credential you created. For OS type, enter SSH for Linux or PSH for Windows. For example:

    ```
    SSH:152

    or

    PSH:153
    ```

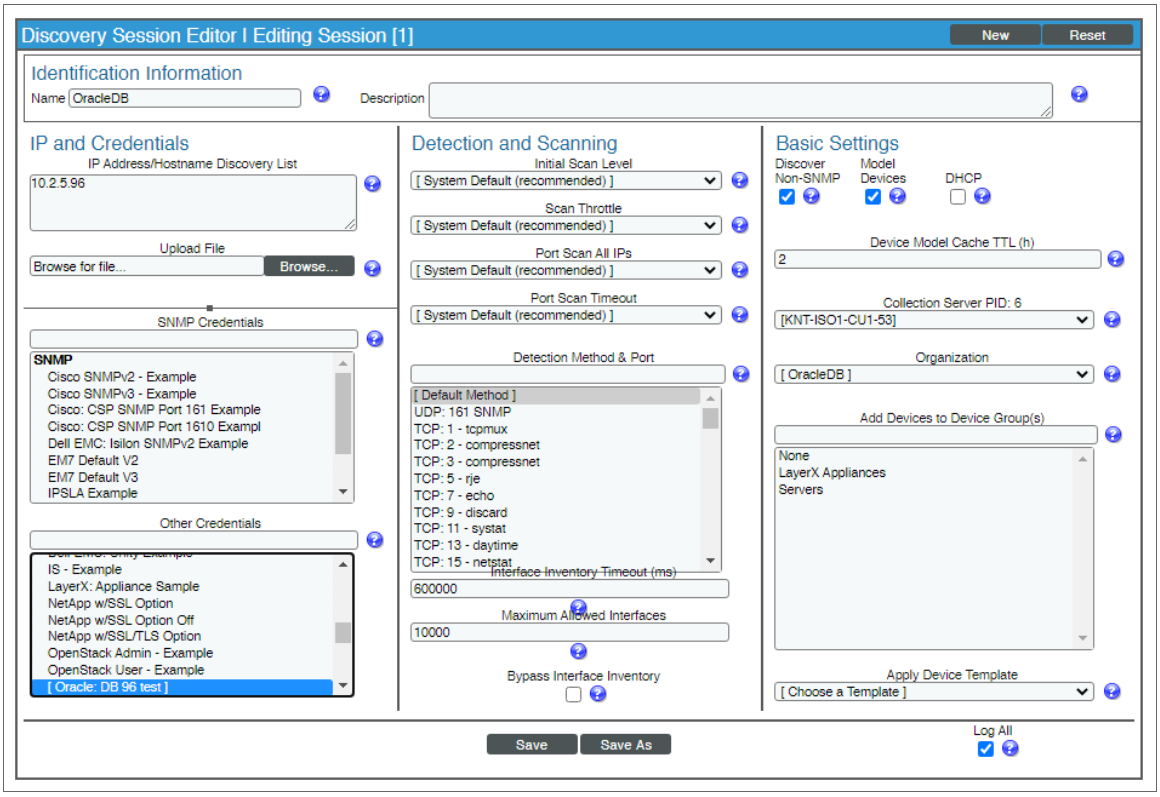
NOTE: Only one OS type per credential is supported.

4. Click the **[Save As]** button.

Discovering Oracle Database Instances

To model and monitor your Oracle Database instances, you must run a discovery session. To create and run a discovery session that will discover your Oracle Database instances, perform the following steps:

1. Go to the **Discovery Control Panel** page (System > Manage > Discovery).
2. Click the **[Create]** button to create a new discovery session. The **Discovery Session Editor** window appears:



3. Enter values in the following fields:
   - ***IP Address Discovery List***. Type the IP address for the server that is hosting your Oracle Database. One discovery session per server is supported.
   - ***Other Credentials***. Select the SOAP/XML credential that you configured in the previous section.
   - ***Discover Non-SNMP***. Select this checkbox.
   - ***Model Devices***. Select this checkbox.
4. You can enter values in the other fields on this page, but are not required to and can simply accept the default values. For more information about the other fields on this page, see the ***Discovery & Credentials*** manual.
5. Click the **[Save]** button and then close the **Discovery Session Editor** window.

6. The discovery session you created will appear at the top of the **Discovery Control Panel** page. Click its lightning-bolt icon ( ) to run the discovery session.
7. The **Discovery Session** window will be displayed.
8. When the server that is hosting the Oracle Database is discovered, click its device icon ( ) to view the **Device Properties** page for that device.
9. After the server hosting the Oracle Database is discovered, the "Oracle: DB Instance Discovery" Dynamic Application will automatically be aligned. This Dynamic Application will discover the Oracle Database instances which will appear in the **Device Manager** page.

NOTE: If you are on a Windows system and are having issues with discovery, please see the ***Monitoring Windows Systems with PowerShell*** manual section.

Verifying Discovery and Dynamic Application Alignment

To verify alignment of the Oracle Database Dynamic Applications:

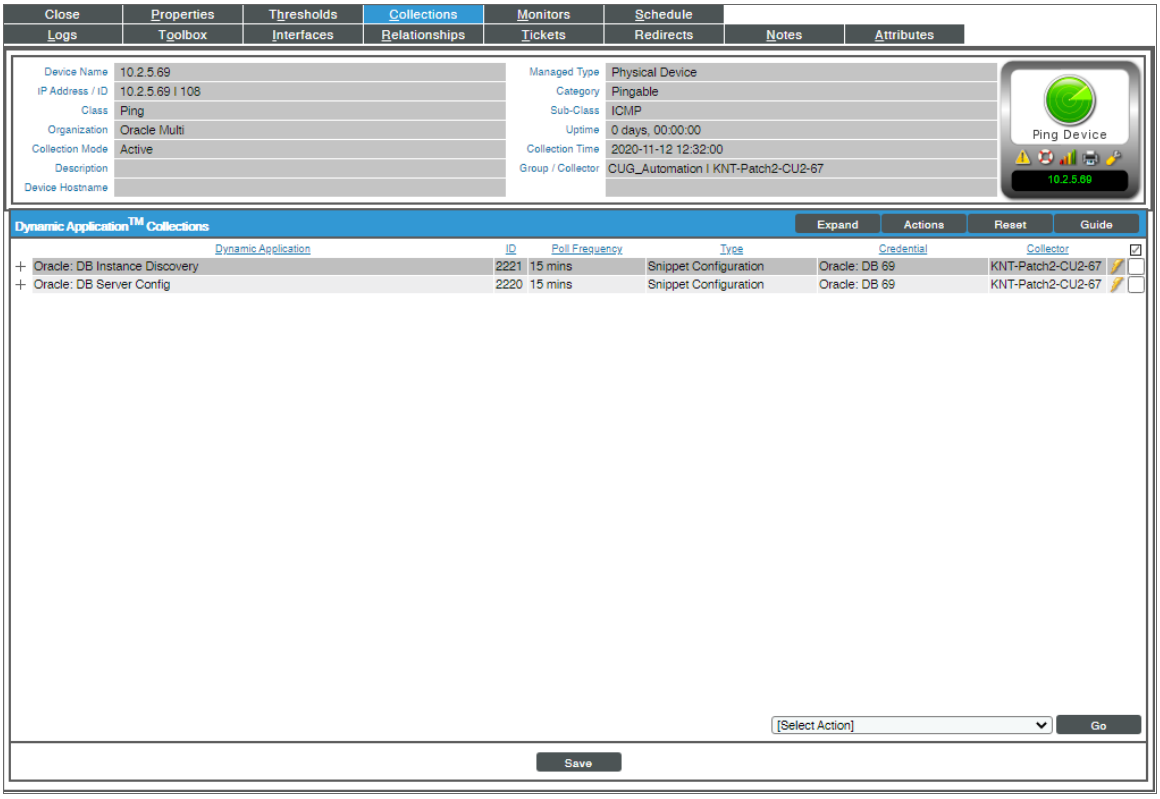
1. After discovery has completed, click the device icon for the Oracle device ( ). From the **Device Properties** page for the Oracle device, click the **[Collections]** tab. The **Dynamic Application Collections** page appears.

   NOTE: It can take two to three polling cycles after the discovery session has completed for Dynamic Applications to appear in the **Dynamic Application Collections** page.

2. All applicable Dynamic Applications are automatically aligned to the root device and component devices during discovery:

You should see the following Dynamic Applications aligned to the root device:

- Oracle: DB Instance Discovery
- Oracle: DB Server Config



You should see the following Dynamic Applications aligned to **non-RAC Oracle Database instances on Linux Systems**:

- Oracle: DB Archived File System Stats
- Oracle: DB Chained Rows Stats
- Oracle: DB Components Status Config
- Oracle: DB Data Guard Gap Stats
- Oracle: DB Database Size Stats
- Oracle: DB Instance Config
- Oracle: DB Integrity Metrics Stats

NOTE: The Oracle: DB Integrity Metrics Stats Dynamic Application uses the prior() function which requires SL1 version 8.14.2 or newer.

- Oracle: DB Log Alerts Config

NOTE: The Oracle: DB Log Alerts Config Dynamic Application requires that the database administrator grant SELECT privileges in the v$diag_alert_text to the monitoring user.

- Oracle: DB Logswitch Rate Stats
- Oracle: DB Non-Archived File System Stats
- Oracle: DB Open Cursors per Session Stats
- Oracle: DB Performance Stats
- Oracle: DB Resource Stats
- Oracle: DB Session Stats
- Oracle: DB Tablespace Stats
- Oracle: DB Tablespace Temp Stats
- Oracle: DB Tablespaces and Datafiles Status Config

You should see the following Dynamic Applications aligned to **non-RAC Oracle Database instances on Windows and Solaris Systems**:

- Oracle: DB Chained Rows Stats
- Oracle: DB Components Status Config
- Oracle: DB Data Guard Gap Stats
- Oracle: DB Database Size Stats
- Oracle: DB Instance Config
- Oracle: DB Integrity Metrics Stats

NOTE: The Oracle: DB Integrity Metrics Stats Dynamic Application uses the prior() function which requires SL1 version 8.14.2 or newer.

- Oracle: DB Log Alerts Config

NOTE: The Oracle: DB Log Alerts Config Dynamic Application requires that the database administrator grant SELECT privileges in the v$diag_alert_text to the monitoring user.

- Oracle: DB Logswitch Rate Stats
- Oracle: DB Open Cursors per Session Stats
- Oracle: DB Performance Stats
- Oracle: DB Resource Stats
- Oracle: DB Session Stats
- Oracle: DB Tablespace Stats
- Oracle: DB Tablespace Temp Stats
- Oracle: DB Tablespaces and Datafiles Status Config

You should see the following Dynamic Applications aligned to **RAC Oracle Database instances on Linux Systems**:

- Oracle: DB Archived File System Stats
- Oracle: DB Chained Rows Stats
- Oracle: DB Components Status Config
- Oracle: DB Data Guard Gap Stats
- Oracle: DB Database Size Stats
- Oracle: DB Instance Config
- Oracle: DB Integrity Metrics Stats

NOTE: The Oracle: DB Integrity Metrics Stats Dynamic Application uses the prior() function which requires SL1 version 8.14.2 or newer.

- Oracle: DB Log Alerts Config

NOTE: The Oracle: DB Log Alerts Config Dynamic Application requires that the database administrator grant SELECT privileges in the v$diag_alert_text to the monitoring user.

- Oracle: DB Logswitch Rate Stats
- Oracle: DB Non-Archived File System Stats
- Oracle: DB Open Cursors per Session Stats
- Oracle: DB Performance Stats
- Oracle: DB RAC Disk Group Space Stats
- Oracle: DB RAC Flash Recovery Stats
- Oracle: DB RAC Global Cache Stats

NOTE: The Oracle RAC Dynamic Applications will only be aligned on RAC systems.

- Oracle: DB Resource Stats
- Oracle: DB Session Stats
- Oracle: DB Tablespace Stats
- Oracle: DB Tablespace Temp Stats
- Oracle: DB Tablespaces and Datafiles Status Config

You should see the following Dynamic Applications aligned to **RAC Oracle Database instances on Windows and Solaris Systems**:

- Oracle: DB Chained Rows Stats
- Oracle: DB Components Status Config
- Oracle: DB Data Guard Gap Stats
- Oracle: DB Database Size Stats
- Oracle: DB Instance Config
- Oracle: DB Integrity Metrics Stats

NOTE: The Oracle: DB Integrity Metrics Stats Dynamic Application uses the prior() function which requires SL1 version 8.14.2 or newer.

- Oracle: DB Log Alerts Config

NOTE: The Oracle: DB Log Alerts Config Dynamic Application requires that the database administrator grant SELECT privileges in the v$diag_alert_text to the monitoring user.

- Oracle: DB Logswitch Rate Stats
- Oracle: DB Open Cursors per Session Stats
- Oracle: DB Performance Stats
- Oracle: DB RAC Disk Group Space Stats
- Oracle: DB RAC Flash Recovery Stats
- Oracle: DB RAC Global Cache Stats

NOTE: The Oracle RAC Dynamic Applications will only be aligned on RAC systems.

- Oracle: DB Resource Stats
- Oracle: DB Session Stats
- Oracle: DB Tablespace Stats
- Oracle: DB Tablespace Temp Stats
- Oracle: DB Tablespaces and Datafiles Status Config

Snippet and Snippet Argument Configuration for New Oracle Dynamic Applications

You can configure snippets and snippet arguments in *Oracle: Database* Dynamic Applications to run SQL queries.

Snippet arguments can be used for simple queries consisting of only SELECT and WHERE. Complex queries must be defined in the snippet.

Running SQL Queries from Snippet Arguments

In the **[Collections]** tab of the a Dynamic Application, you can select a collection object in the **Collection Object Registry** and edit the argument in the ***Snippet Arguments*** field.

For example, using the collection objects from the "Oracle: DB Performance Stats" Dynamic Application:

Snippet argument without a filter:

```
oracle://&silo_args=column=<column_name>&table=<table_name>
```

Snippet argument with a filter:

```
oracle://&silo_args=column=<column_name>&table=<table_name>&filter=<where clause>
```

Example:

```
oracle://&silo_args=column=name&table=my_table&filter=name LIKE '%abc%' AND id != 0
```

NOTE: Spaces can be used in any of the arguments if necessary. Column should name a single column only.

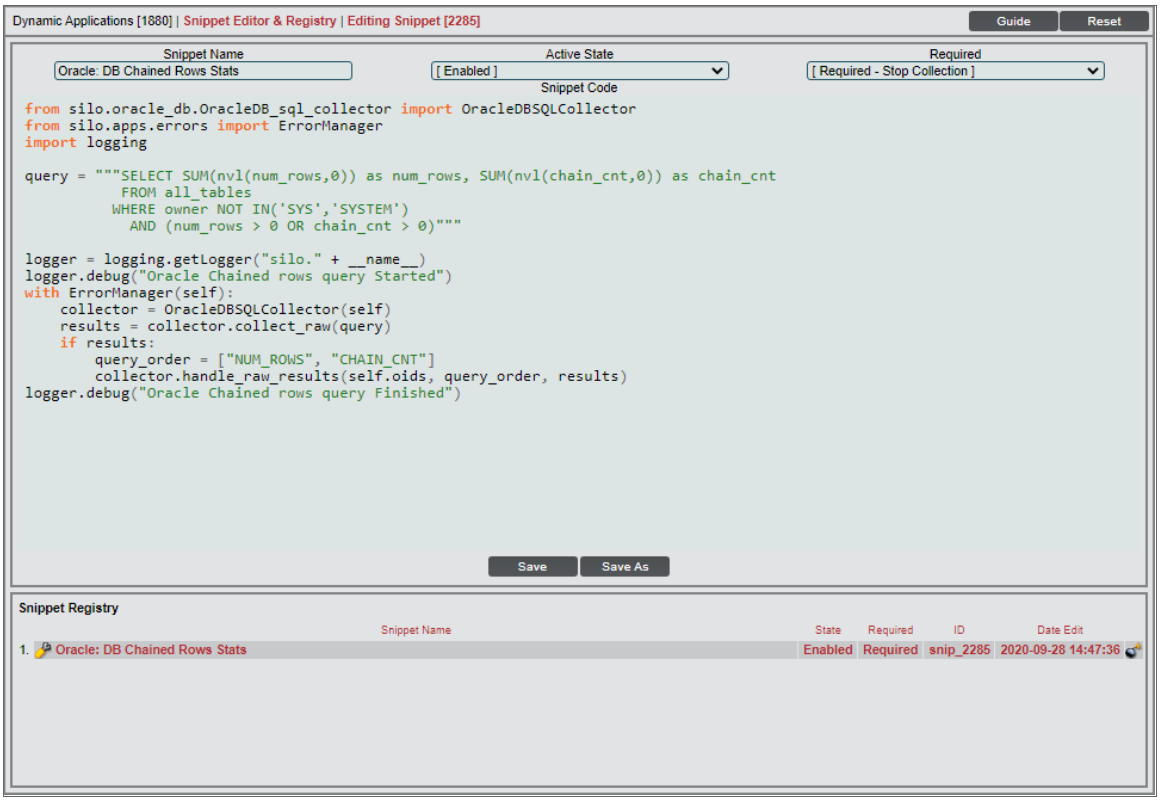
Queries are consolidated into a single SQL query for each table. If you want to separate the queries, use the following format:

```
oracle://&silo_args=column=name&table=my_table a_names&filter=name LIKE 'a%'

oracle://&silo_args=column=name&table=my_table b_names&filter=name LIKE 'b%'
```

Running Raw SQL Queries from the Snippet

You can run raw SQL queries in the snippets in Dynamic Applications by going to the **[Snippets]** tab and selecting the snippet from the **Snippet Registry**:



In the "Oracle: DB Chained Rows Stats" Dynamic Application, you can edit the snippet to include a raw SQL query in the following way:

```
from silo.oracle_db.OracleDB_sql_collector import OracleDBSQLCollector
from silo.apps.errors import ErrorManager
import logging

query = """SELECT X, Y FROM table"""

with ErrorManager(self):
  collector = OracleDBSQLCollector(self)
  results = collector.collect_raw(query)
  if results:
    query_order = ["X", "Y"] #
    collector.handle_raw_results(self.oids, query_order, results)
```

X and Y are collection object OIDs, in the order corresponding to the query column names.

Indexed Raw SQL Query

You can run indexed SQL queries in the snippets in Dynamic Applications by going to the **[Snippets]** tab and selecting the snippet from the **Snippet Registry**.

For example, in the "Oracle: DB Tablespaces and Datafiles Status Config" Dynamic Application, you can edit the snippet to include an indexed SQL query in the following way:

```
from silo.oracle_db.OracleDB_sql_collector import OracleDBSQLCollector
from silo.apps.errors import ErrorManager
```

```
import logging

query = """SELECT x, x, y FROM table""" #<-The first column is the index; it is ok
to repeat a column

with ErrorManager(self):
  collector = OracleDBSQLCollector(self)
  results = collector.collect_raw(query)
  if results:
    query_order = ["X", "Y"]
    collector.handle_raw_results(self.oids, query_order, results, indexed=True)
```

X and Y are collection object OIDs, in the order corresponding to the query column names, not including the index column.

Running Combined Raw SQL Queries and Snippet Arguments

If snippet arguments and raw queries are combined in a single Dynamic Application, the snippet argument code must be executed first. The following example was added to the snippet in the "Oracle: DB Session Stats" Dynamic Application:

```
with ErrorManager(self):
  collector = OracleDBSQLCollector(self)

  # Collect snippet arg results
  collector.collect()
  collector.handle_results()

  # Collect raw query results
  results = collector.collect_raw(query)
  if results:
    collector.handle_raw_results(self.oids, query_order, results)
```

Running SSH Commands from a Snippet

You can run SSHe commands the snippets in Dynamic Applications by going to the **[Snippets]** tab and selecting the snippet from the **Snippet Registry**.

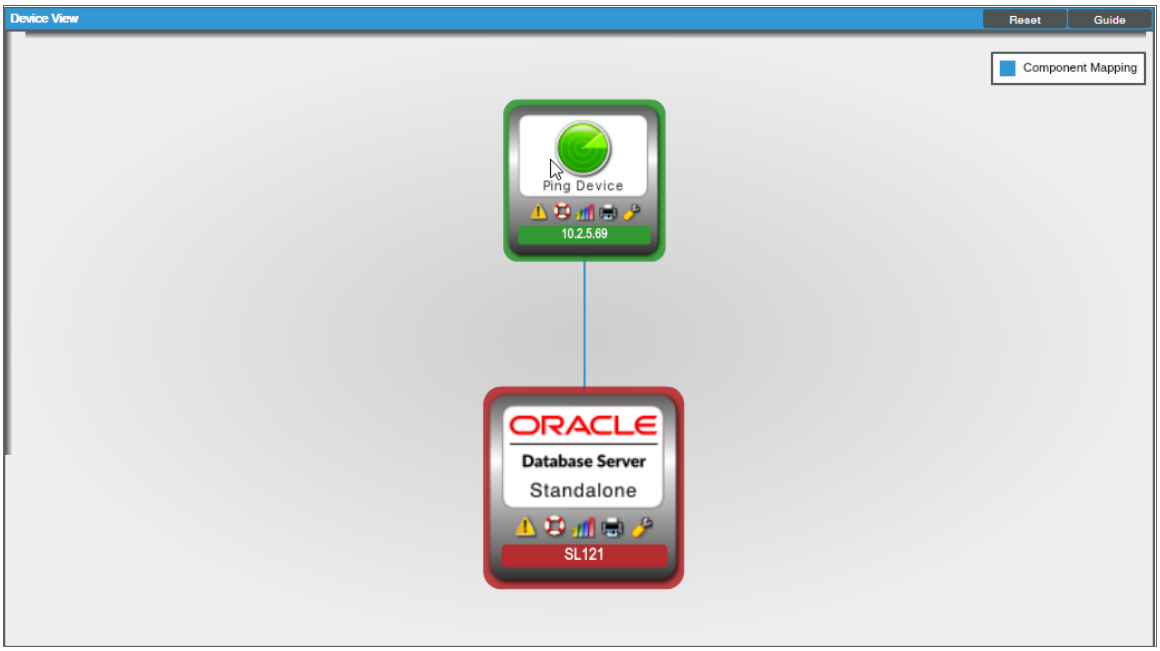
For example, in the "Oracle: DB Non-Archived File System Stats" Dynamic Application, you can edit the snippet to include an SSH command in the following way:

```
ssh.append("your_ssh_command")
ssh_results = ssh_collector.run_commands(ssh)
```

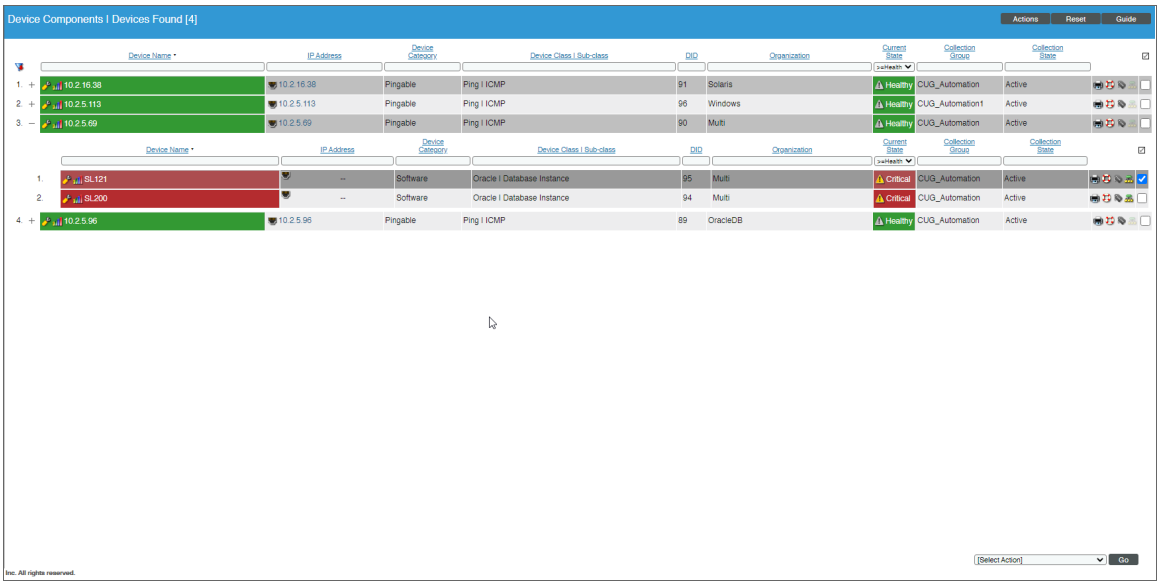
Viewing Oracle Component Devices

In addition to the **Device Manager** page (Registry > Devices > Device Manager), you can view the Oracle Database instances and all associated component devices in the following places in the user interface:

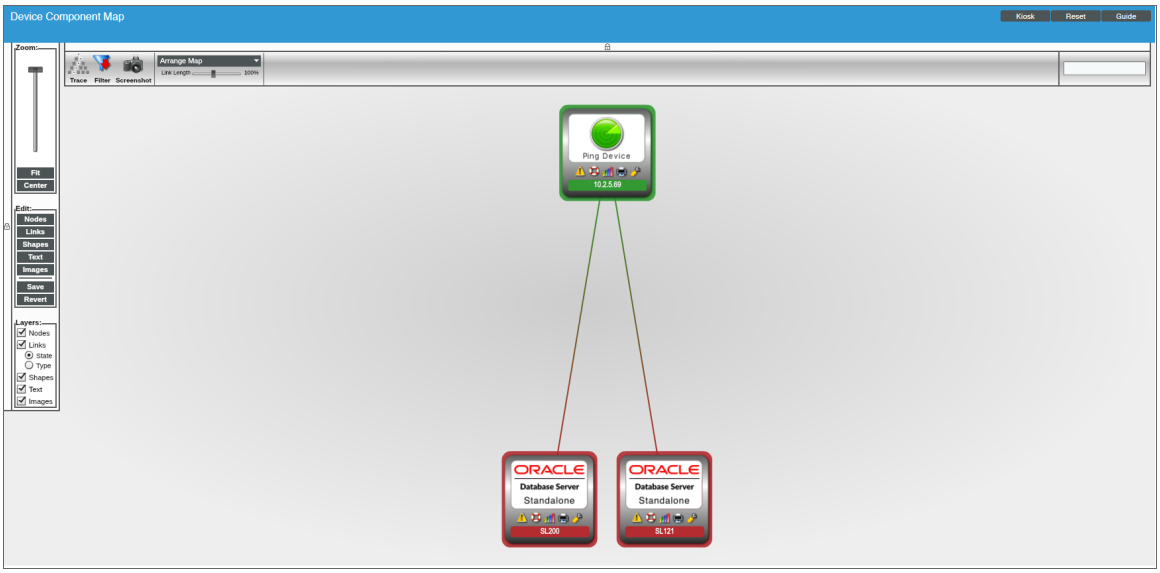
- The **Device View** modal page (click the bar-graph icon [ ] for a device, then click the **Topology** tab) displays a map of a particular device and all of the devices with which it has parent-child relationships. Double-clicking any of the devices listed reloads the page to make the selected device the primary device:



- The **Device Components** page (Registry > Devices > Device Components) displays a list of all root devices and component devices discovered by SL1 in an indented view, so you can easily view the hierarchy and relationships between child devices, parent devices, and root devices. To view the component devices associated with an Oracle Database instance, find the Oracle device and click its plus icon (+):



- The **Component Map** page (Classic Maps > Device Maps > Components) allows you to view devices by root node and view the relationships between root nodes, parent components, and child components in a map. This makes it easy to visualize and manage root nodes and their components. SL1 automatically updates the **Component Map** as new component devices are discovered. The platform also updates each map with the latest status and event information. To view the map for an Oracle Database instance, go to the **Component Map** page and select the map from the list in the left NavBar. To learn more about the **Component Map** page, see the ***Views*** manual.



Chapter 3

Oracle: Database Dashboards

Overview

The following section describes the device dashboard that is included in the *Oracle: Database* PowerPack:

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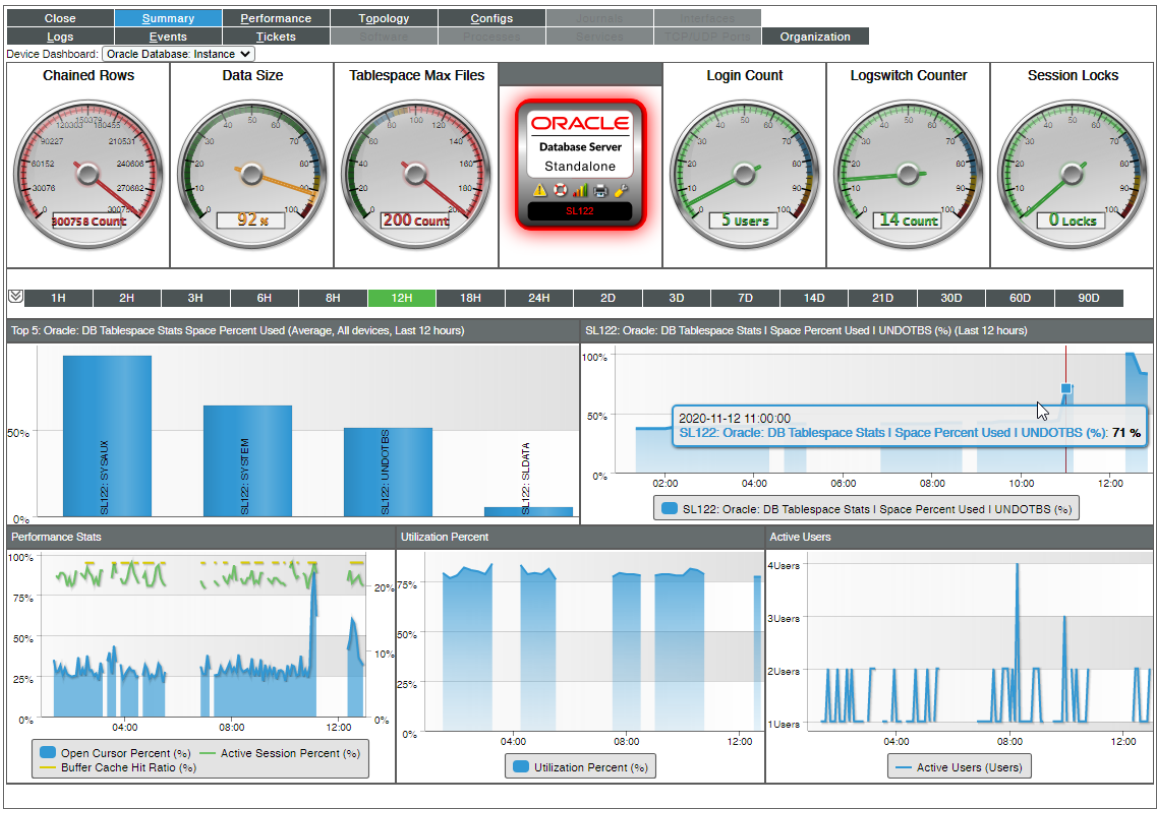
Device Dashboard

The *Oracle: Database* PowerPack includes a device dashboard that provides summary information for an Oracle Database instance. The device dashboard is aligned as the default device dashboard for the Oracle Database instance.

Oracle Database: Instance



The Oracle Database: Instance device dashboard displays the following information:

- Six gauges that display the following metrics:
  - Chained Rows
  - Data Size
  - Tablespace Max Files
  - Login Count
  - Logswitch Counter
  - Session Locks
- A bar graph that displays the Top 5 Oracle: DB Tablespace Stats Space Percent Used
- Four line graphs that display the following information:
  - Oracle: DB Tablespace Stats | Space Percent Used | UNDOTBS (%)
  - Performance Stats
  - Utilization Percent
  - Active Users

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