ScienceLogic

Monitoring Oracle

Oracle: Database PowerPack version 103, revision 1

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Chapter 1

Introduction

Overview

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

> **NOTE:** ScienceLogic provides this documentation for the convenience of ScienceLogic customers. Some of the configuration information contained herein pertains to third-party vendor software that is subject to change without notice to ScienceLogic. ScienceLogic makes every attempt to maintain accurate technical information and cannot be held responsible for defects or changes in third-party vendor software. There is no written or implied guarantee that information contained herein will work for all third-party variants. See the End User License Agreement (EULA) for more information.

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

What Operating Systems Does the Oracle: Database PowerPack Monitor?

The *Oracle: Database* PowerPack supports operating system discovery for a variety of operating systems. The following operating systems can be monitored by the *Oracle: Database* PowerPack:

- AIX
- CentOS
- HP-UX
- Oracle Linux
- Red Hat Enterprise Linux
- Solaris
- SUSE Linux
- Ubuntu
- Windows

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.

NOTE: If you are using PEM key to connect to a Unix server on Oracle Database v101 and you upgrade your SL1 version to 8.14.11+, 10.1.6+, 10.2.1+ or 11.1.0+, the PowerPack will not work. If this applies to you, try to upgrade to v102 or enter your username/password to access the SSH key.

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

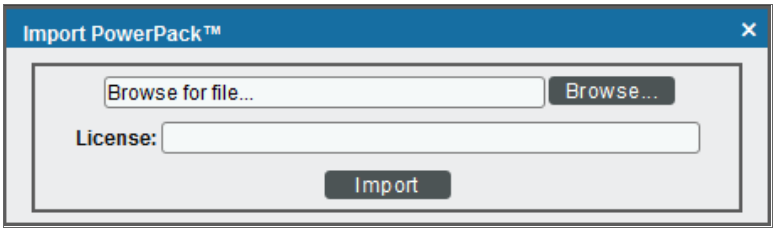
You must also remove any pre-existing discovered Oracle Database device trees and all Oracle device classes before installing.

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 Support Site.
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 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
    - dba_tablespaces
    - dba_temp_files
    - gv$sort_segment
    - sys.dba_ind_partitions
    - sys.dba_ind_subpartitions
    - sys.dba_indexes
    - sys.dba_objects
    - sys.v_$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
- On any Unix environment, the user must set the following ORACLE_HOME environment variable to point to the directory where the Oracle database client software is installed. If the variable is not set, the PowerPack will exhibit inconsistent results:
    - `$ORACLE_HOME`
- The Oracle database user must have permission to alter sessions.
- Minimal permissions (for Linux) of Oracle files (installed in the customer's server) include:
    - Directories: `--x`
    - Binaries (oracle_path/bin): `--x`
    - Libraries (oracle_path/lib): `r-x`
    - File "listeners.ora": `r--`
    - File "tnsnames.ora": `r--`
    - Everything else that's not an executable: `r--`

NOTE: `r`= read; `w`= write; `x`= execute; `-`= denied. All files and directories can be owned by another non-credential user in SL1. However, the permissions must be given to the credential user's group, or to everyone else (Other).

TIP: If you do not want to configure permissions, you can move the SSH user to the group used by the Oracle installer.

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*

Suggested Timeout Configuration

There are current platform limitations to implement a timeout for Database Server sessions.
To prevent issues and perform the suggested configuration:

1. Create a new profile for the DB user in the Database.
2. Configure the profile with these queries:

- `ALTER PROFILE <profile> LIMIT IDLE_TIME 3`
- `ALTER PROFILE <profile> LIMIT CONNECT_TIME 3`

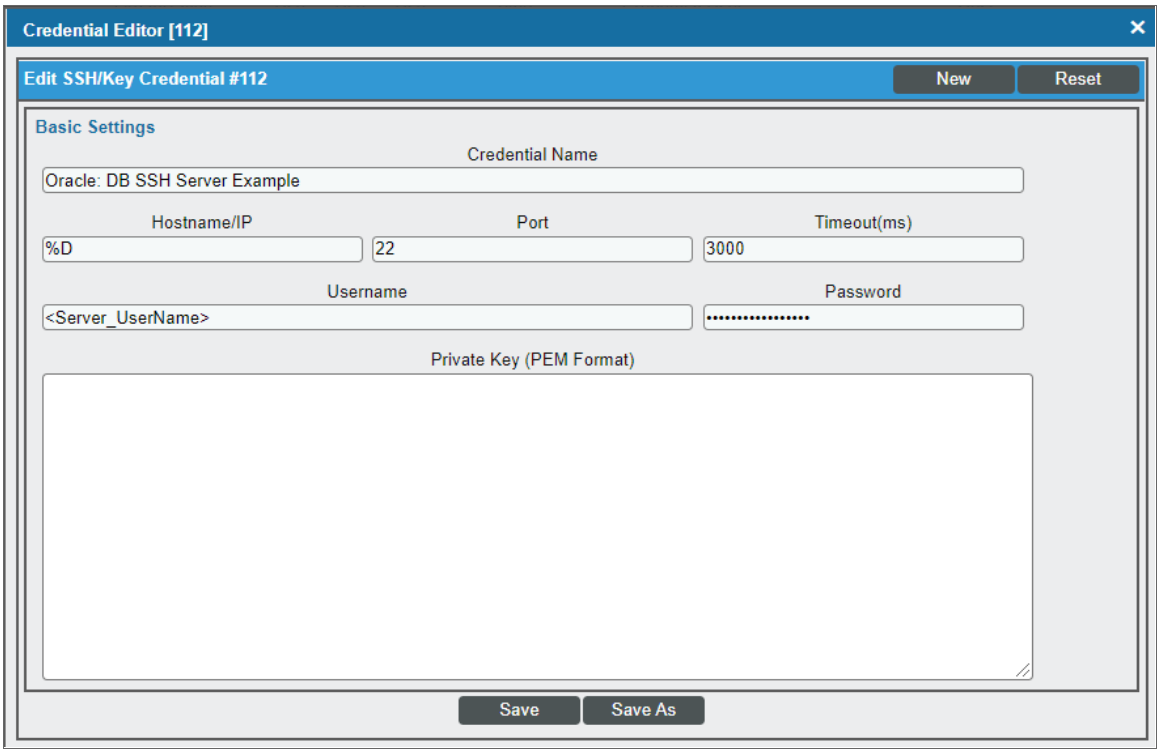
With this configuration implemented, a three-minute minute timeout session is established. This allows the user time to stop the collection if it prevents SL1 to create SIGTERMs.

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 "%D" or the IP address of the 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.
   - ***Private Key (PEM Format)***. Optional. Use if required for SSH authentication. For information on gathering a private key, see the section on *Enabling PEM on a Linux Machine*.

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

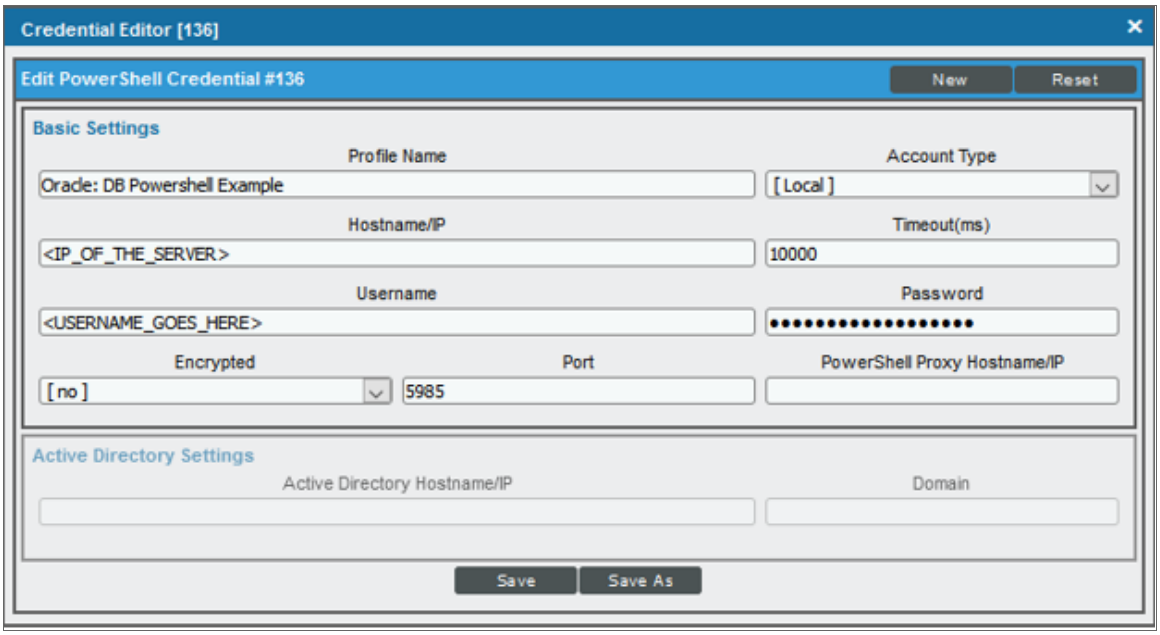
> **NOTE:** The credential ID will appear at the top of the window after it has been saved. Take note of the ID as you will need it when creating the SOAP/XML credential.

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*. However, if you plan to host an Oracle Database in a server that is part of an Active Directory, select Active Directory and configure a user without admin permissions.

NOTE: For ease of configuration, ScienceLogic recommends using an Active Directory account that is a member of the local Administrators group.

   - ***Active Directory Settings***. Hostname/IP of the AD Server, not the server's IP that is part of the AD.
   - ***Domain***. Domain the user is in.
   - ***Hostname/IP***. Type "%D" or 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.

If you do not have Local Administrator access to the servers that you want to monitor with PowerShell or WinRM, or if the monitored Windows server is a Domain Controller that will not be in the local Administrators group, then you must first create a domain user account or create a local user account on the Windows Server.

To configure Windows Servers to allow access by your non-administrator user account:

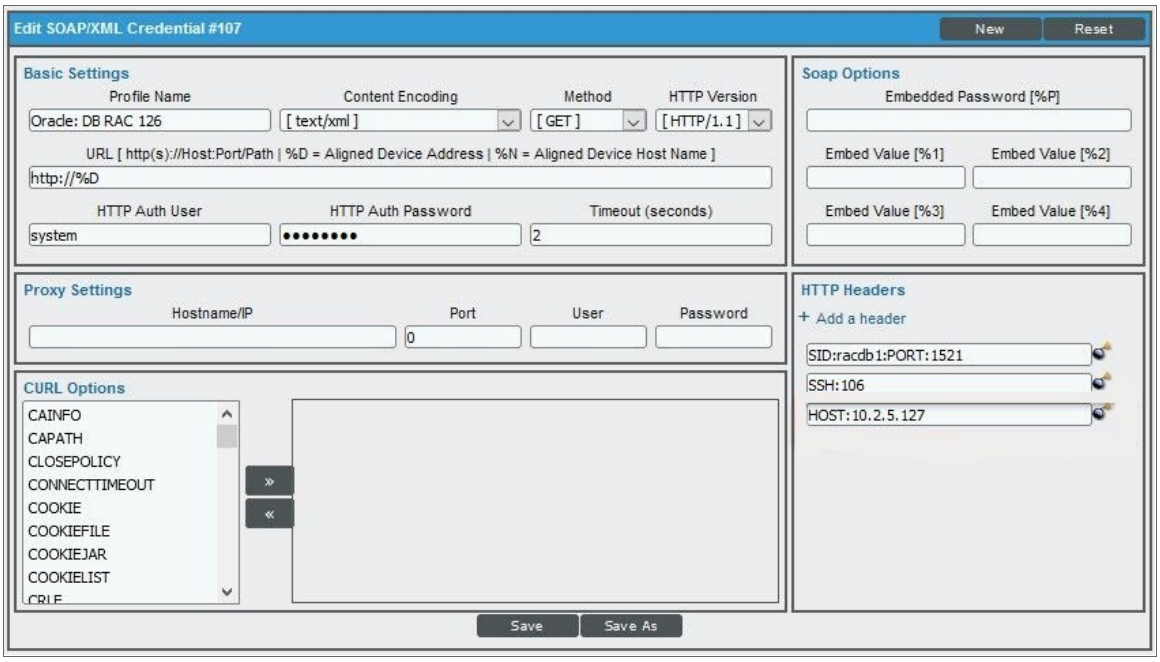
1. See Option 3: Creating a Non-Administrator User Account in the Configuring Windows Servers for Monitoring with PowerShell manual, and follow Option 3's steps.
2. Configure a Server Authentication Certificate. See Step 2: Configuring a Server Authentication Certificate in the same manual to follow steps if needed.
3. Configure a Windows Remote Management. See Step 3: Configuring Windows Remote Management and follow the "Option 1: Using a Script to Configure Windows Remote Management" instructions.

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. The entire ASM name must be added as the SID value. For example, if +ASM1 is the name, the header will be:

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

  - `SERVICE_NAME: <Service Name acts as an alias to SID>:PORT:<Oracle Instance Port that is listening for DB requests>`. For example:

    ```
    SERVICE_NAME:SL121:PORT:1521
    ```

NOTE: If the **SERVICE_NAME** is different than the **SID**, discovery will not work.

  - If a host, or IP address, for the Oracle: Database is assigned to a different IP address from the server, you must add an additional header to the SOAP credential.

    If each Oracle database instance is registered to an IP address, add a header for HoSt in addition to SID and port. The PowerPack will connect the host IP addresses to the respective Oracle database instance. For example:

    ```
    Ex - sid:<>:port<>:host:<>
    ```

    If all Oracle database instances are registered to a single IP address that is different from the server, add a header with only the host information. This header will force the PowerPack to use the host IP address to connect to all Oracle database instances. For example:

    ```
    HOST:<>
    ```

    If no HOST is provided in the header, the PowerPack will use the root IP address or the server IP address to connect to all Oracle database instances.

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.

Enabling PEM on a Linux Machine

Linux and Unix users can create an SSH/Key credential in order to monitor Oracle Database instances in SL1. The ***Private Key (PEM Format)*** field may be filled when *creating an SSH/Key credential*. To enable PEM on a Linux machine, perform the following steps:

1. Create a PEM folder to place the identity keys.

NOTE: ScienceLogic suggests that you create a PEM folder inside the .ssh folder of the user that will use the PEM authentication.

2. Run the following command on your Linux machine to create the SSH key. This command will create public and private keys:

```
ssh-keygen -b 2048 -f identity - t rsa
```

NOTE: The value "identity" in the command above will be the name of the file that is generated. This value can be replaced with any file name.

3. The private key generated from this command is the .pem file needed for the SSH/Key credential. Copy the contents of the file to input into the SL1 credential.
4. Add the generated public key to the `authorized_keys` file that is found in `~/.ssh/authorized_keys` manually or by using the following command:

```
cat identity.pub >> ~/.ssh/authorized_keys
```

5. Restart the SSH service by running the following command:

```
sudo service ssh restart
```

Following the steps above, you can create an SSH/Key credential in SL1 by supplying your Linux server username, Linux server password, and private key. If you would like to create an SSH/Key credential by supplying only your Linux server username and private key, perform the following steps on your Linux machine:

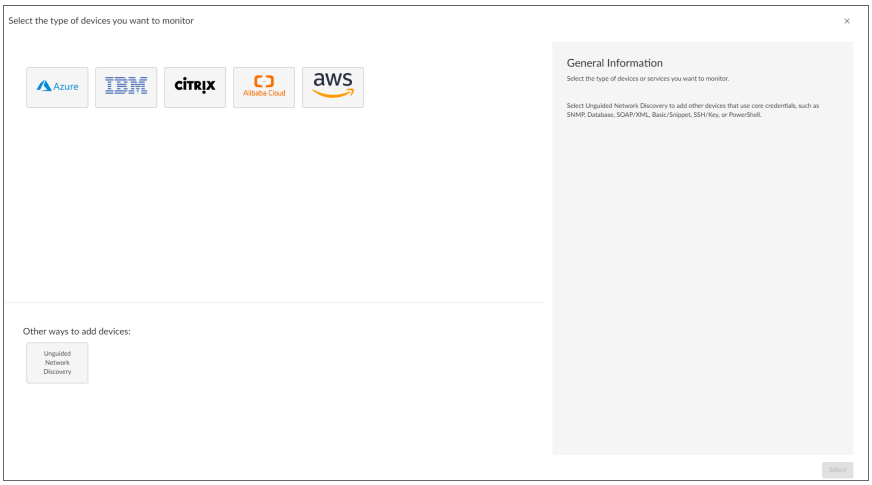
1. Find the `sshd_config` file.
2. Find the `PasswordAuthentication` command line, delete `yes`, and input `no`.
3. Restart the SSH service by running the following command:

```
sudo service ssh restart
```

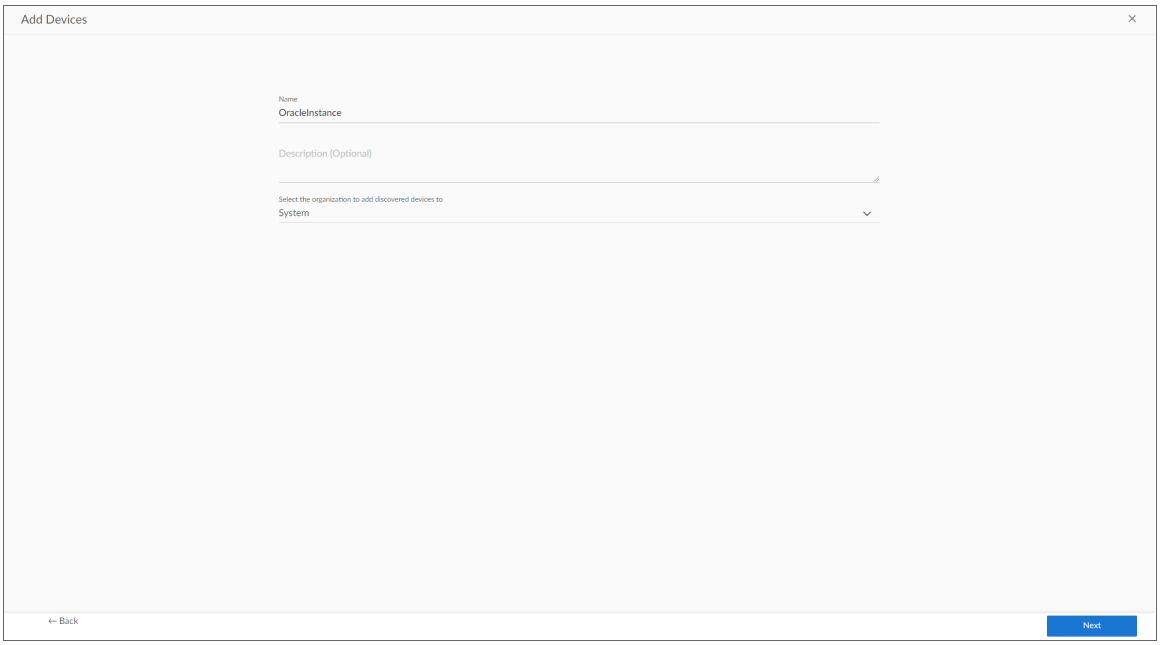
Discovering Oracle Database Instances

To create and run a discovery session that will discover an Oracle instance, perform the following steps:

1. On the **Devices** page ( ) or the **Discovery Sessions** page (Devices > Discovery Sessions), click the **[Add Devices]** button. The **Select** page appears:



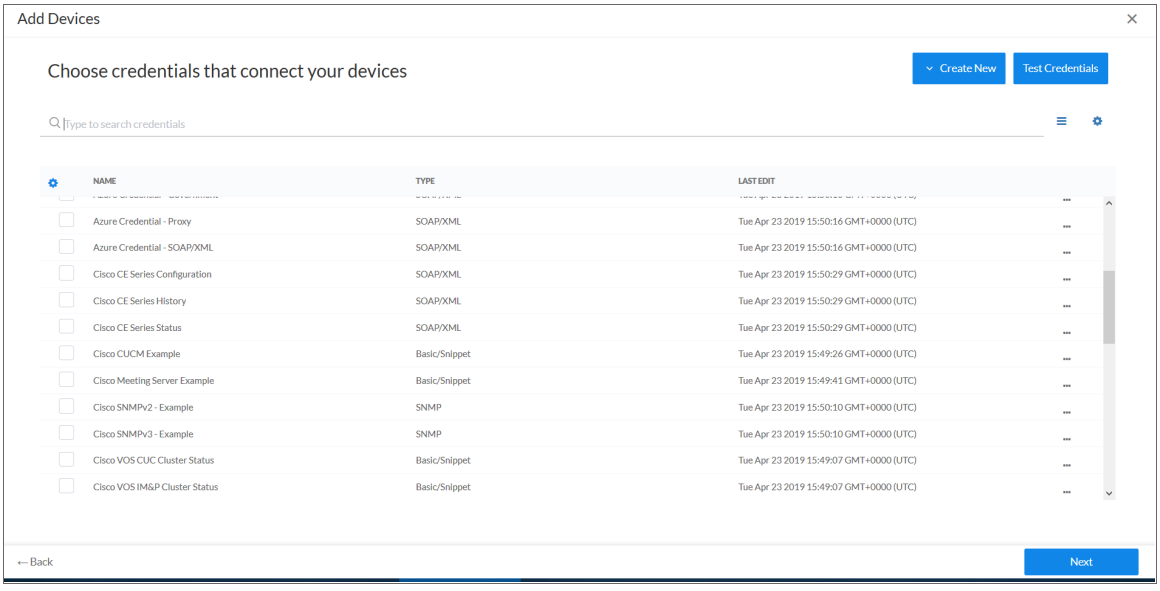
2. Click the **[Unguided Network Discovery]** button. Additional information about the requirements for discovery appears in the **General Information** pane to the right.
3. Click **[Select]**. The **Add Devices** page appears:



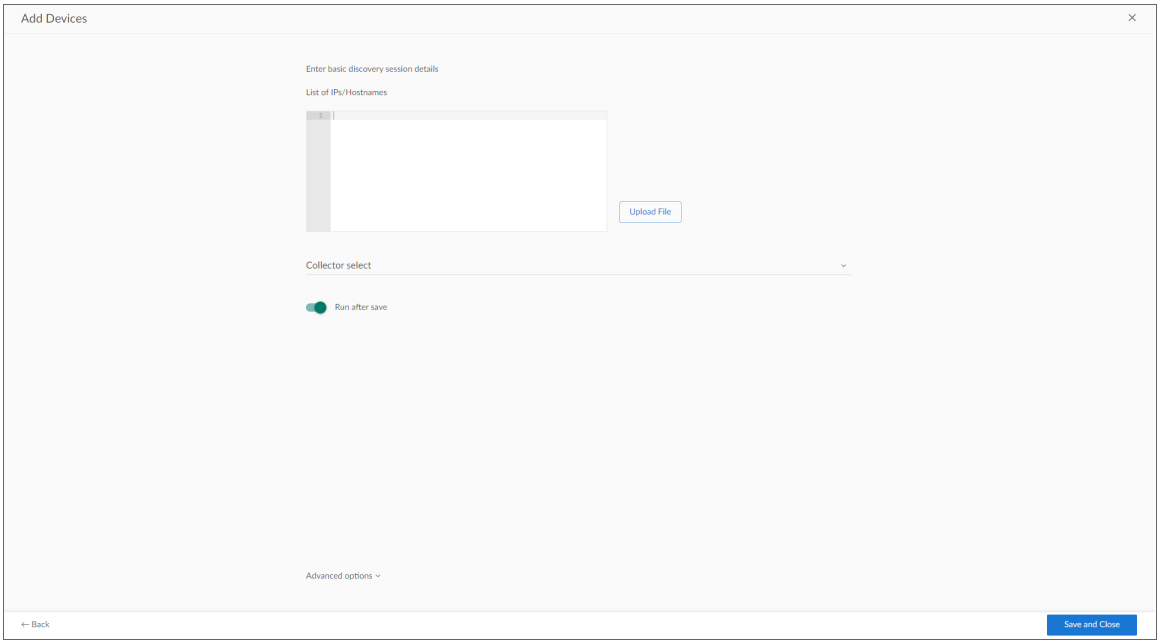
4. Complete the following fields:

   - ***Name***. Type a unique name for this discovery session. This name is displayed in the list of discovery sessions on the **[Discovery Sessions]** tab.
   - ***Description***. Optional. Type a short description of the discovery session. You can use the text in this description to search for the discovery session on the **[Discovery Sessions]** tab.
   - ***Select the organization to add discovered devices to***. Select the name of the organization to which you want to add the discovered devices.

5. Click **[Next]**. The **Credentials** page of the **Add Devices** wizard appears:



6. On the **Credentials** page, select the *SOAP/XML credential* you created.
7. Click **[Next]**. The **Discovery Session Details** page of the **Add Devices** wizard appears:



8. Complete the following fields:
   - ***List of IPs/Hostnames***. Type the IP address for the server that is hosting your Oracle Database.
   - ***Which collector will monitor these devices?***. Select an existing collector to monitor the discovered devices. Required.
   - ***Run after save***. Select this option to run this discovery session as soon as you click **[Save and Close]**.

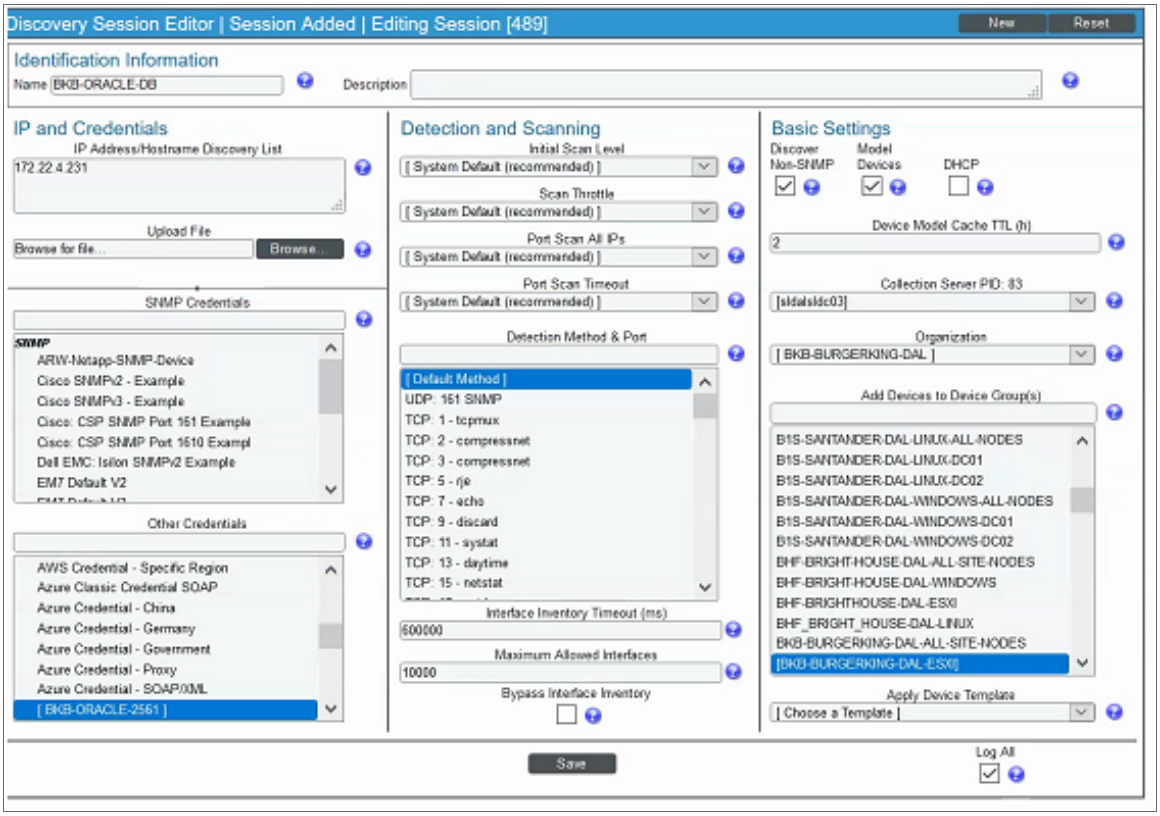
     In the **Advanced options** section, click the down arrow icon ( ) to complete the following fields:

     - ***Discover Non-SNMP***. Enable this setting.
     - ***Model Devices***. Enable this setting.
9. Click **[Save and Close]** to save the discovery session. The **Discovery Sessions** page (Devices > Discovery Sessions) displays the new discovery session.
10. If you selected the **Run after save** option on this page, the discovery session runs, and the **Discovery Logs** page displays any relevant log messages. If the discovery session locates and adds any devices, the **Discovery Logs** page includes a link to the **Device Investigator** page for the discovered device.

Discovering Oracle Database Instances in the SL1 Classic User Interface

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 > Classic 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:

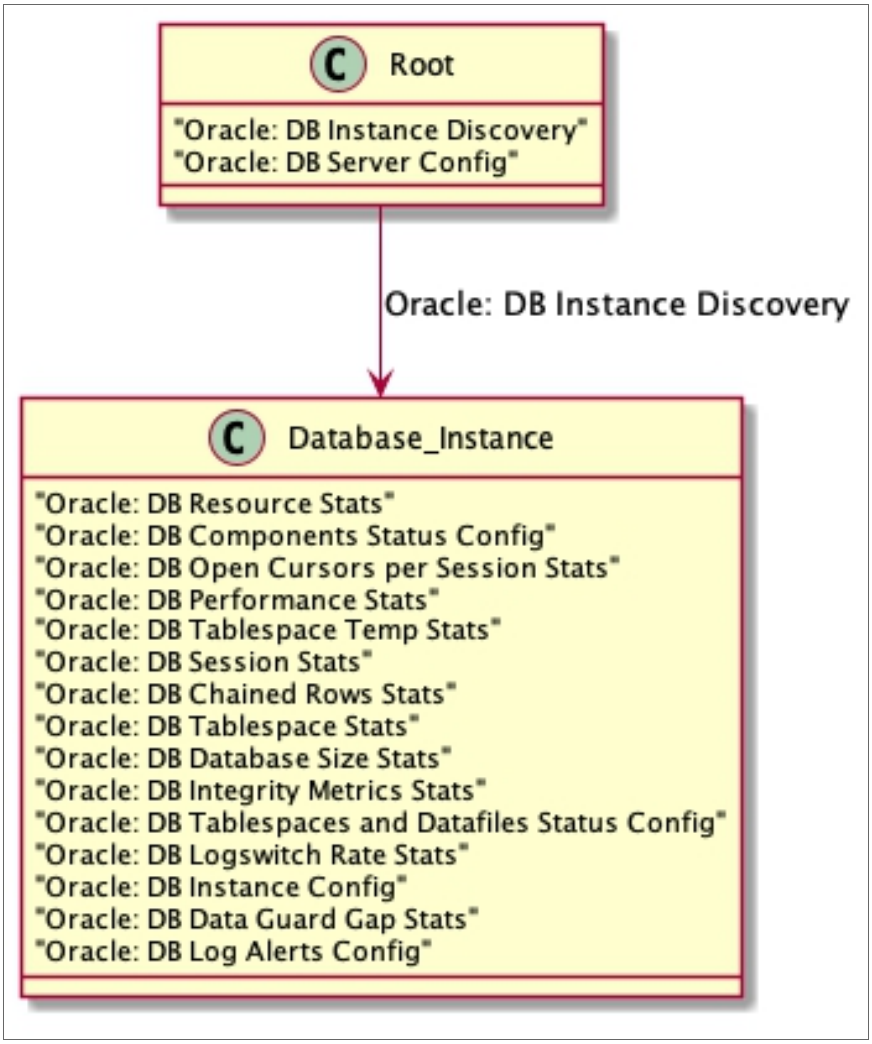
   - ***IP Address Discovery List***. Type the IP address for the server that is hosting your Oracle Database. One discovery session per server is supported. The IP address can be assigned to a different IP address than the server.
   - ***Other Credentials***. Select the SOAP/XML credential that you configured 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

During discovery, SL1 will discover the root device then the Database instance. All applicable Dynamic Applications will be aligned to the component as follows:



To verify alignment of the Oracle Database Dynamic Applications:

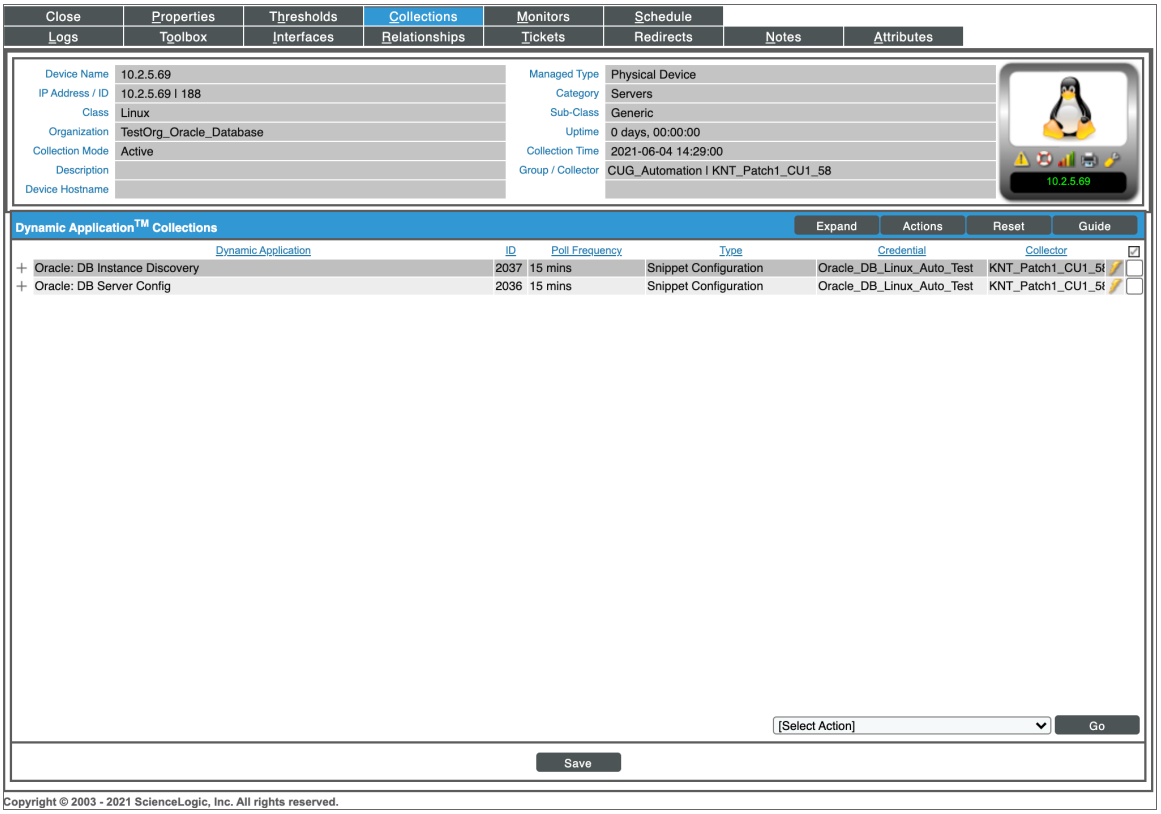
1. After discovery has completed, click the device icon for the Oracle device ( ). From the **Device Properties** page for the Oracle device, click the **[Collections]** tab. The **Dynamic Application Collections** page appears.

> **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.

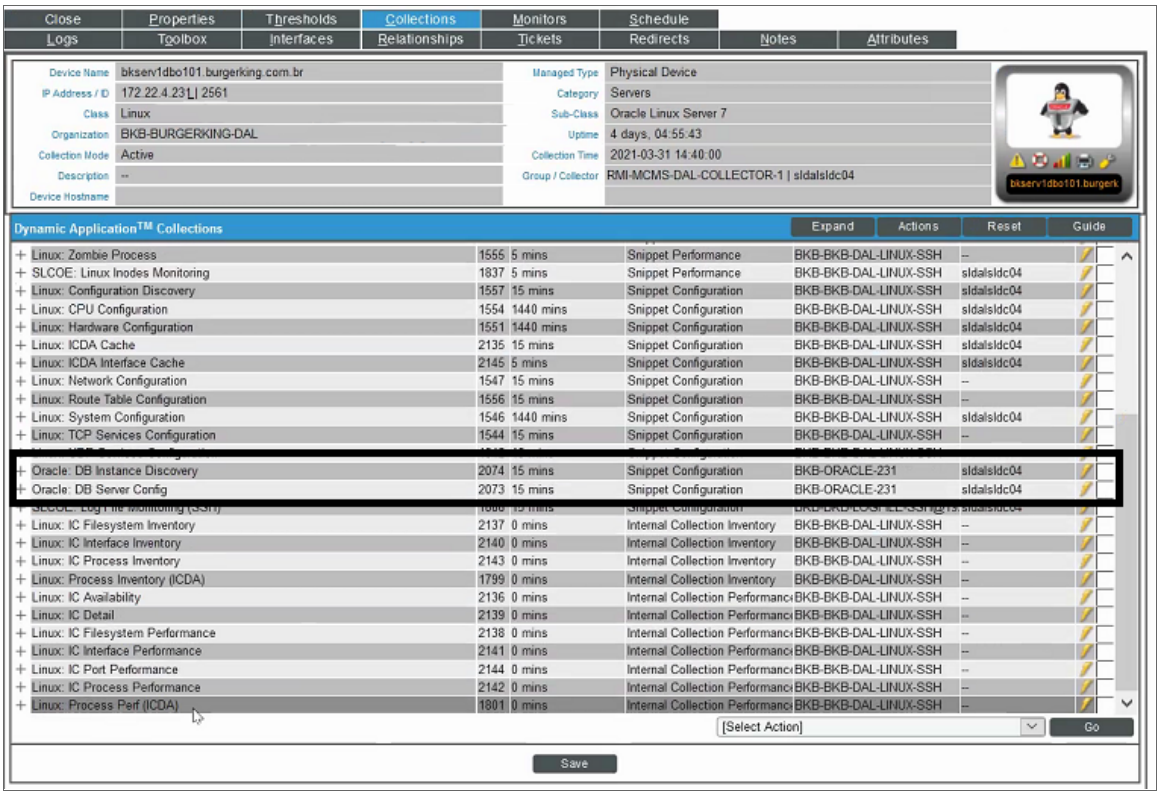
2. All applicable Dynamic Applications are automatically aligned to the root device and component devices during discovery:

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

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



Using an Oracle PP on an existing Linux device will not interfere with the historical data on the device. Instead, the Oracle will align at the root with the other Linux Dynamic Applications.



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

- Oracle: DB Archived File System Stats
- Oracle: DB Chained Rows Stats
- Oracle: DB Components Status Config
- Oracle: DB Instance Invalid Object Stats
- 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 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 Instance Invalid Object Stats
- 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 and Solaris 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 Instance Invalid Object 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 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 Instance Invalid Object Stats
- 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.

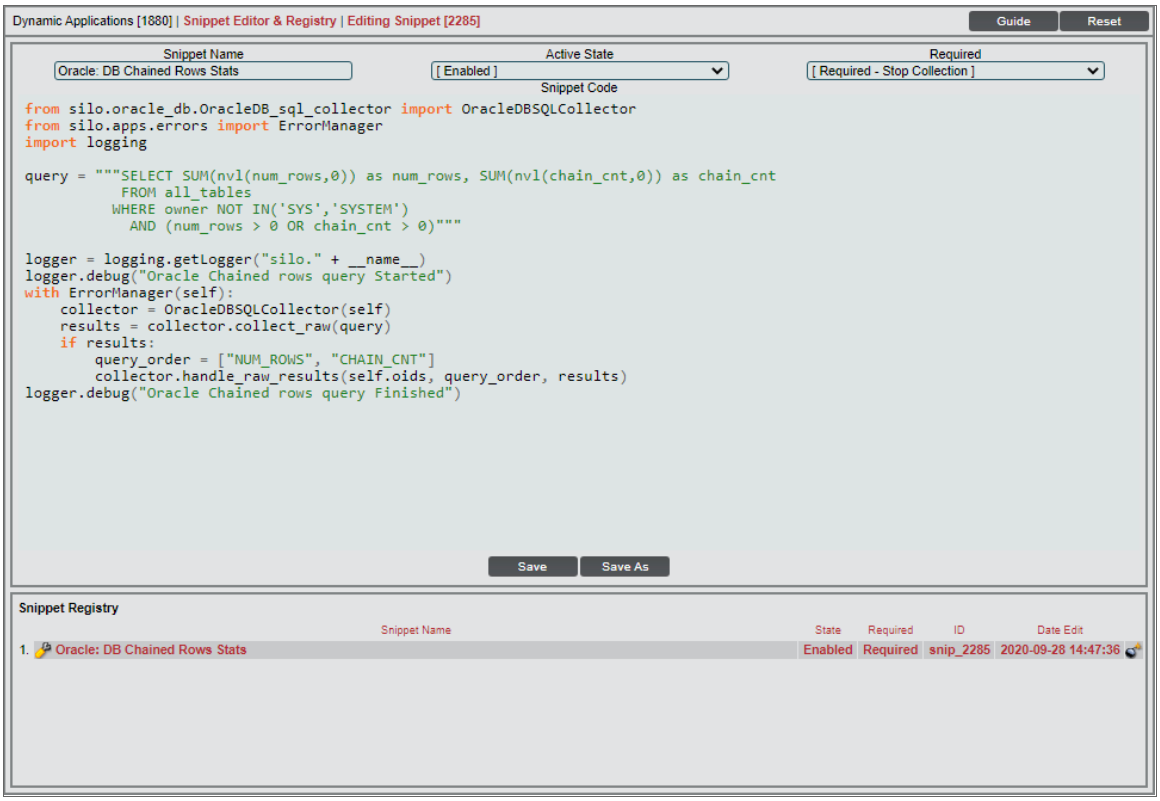
Queries are consolidated into a single SQL query for each table. If you want to separate the queries, use the following format:

```
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 SSH 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 **Devices** page, you can view the Oracle Database and all associated component devices in the following places in the user interface:

- The **Device Investigator** Map page (click **Map** in the **Device Investigator** page) displays a map of a particular device and all of the devices with which it has parent-child relationships. Double-clicking any of the listed devices reloads the page to make the selected device the primary device.

- The **Device Components** page (Devices > Device Components) displays a list of all root devices and component devices discovered by SL1. The **Device Components** page displays all root devices and component devices 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, find the Oracle Database and click its plus icon (+).

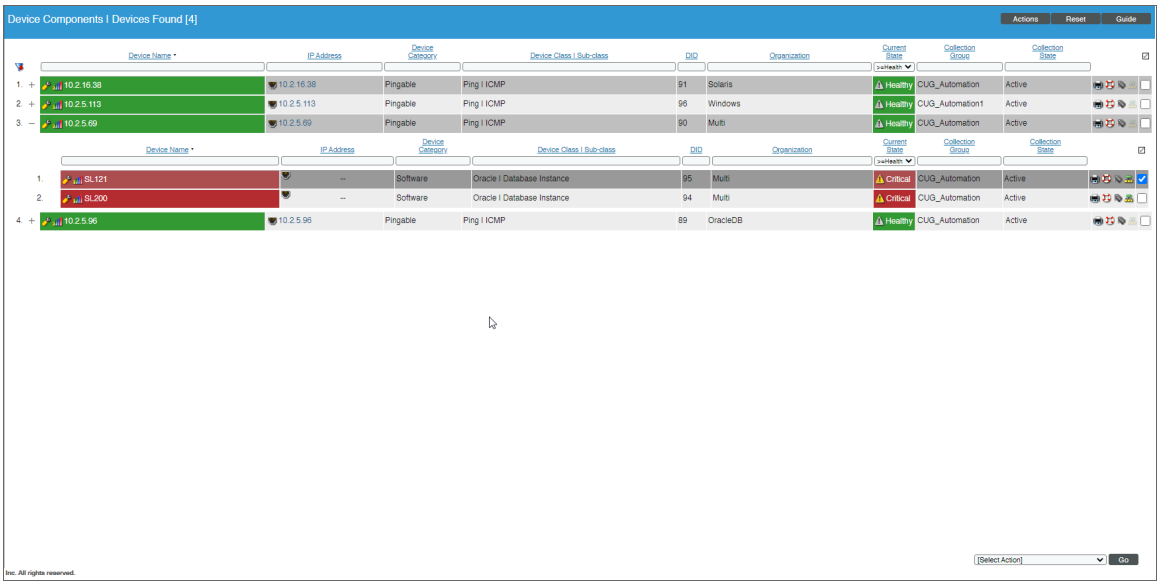
- The **Component Map** page (Classic Maps > Device Maps > Components) allows you to view devices by root node and view the relationships between root nodes, parent components, and child components in a map. This makes it easy to visualize and manage root nodes and their components. SL1 automatically 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, 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.

Viewing Oracle Component Devices in the Classic SL1 User Interface

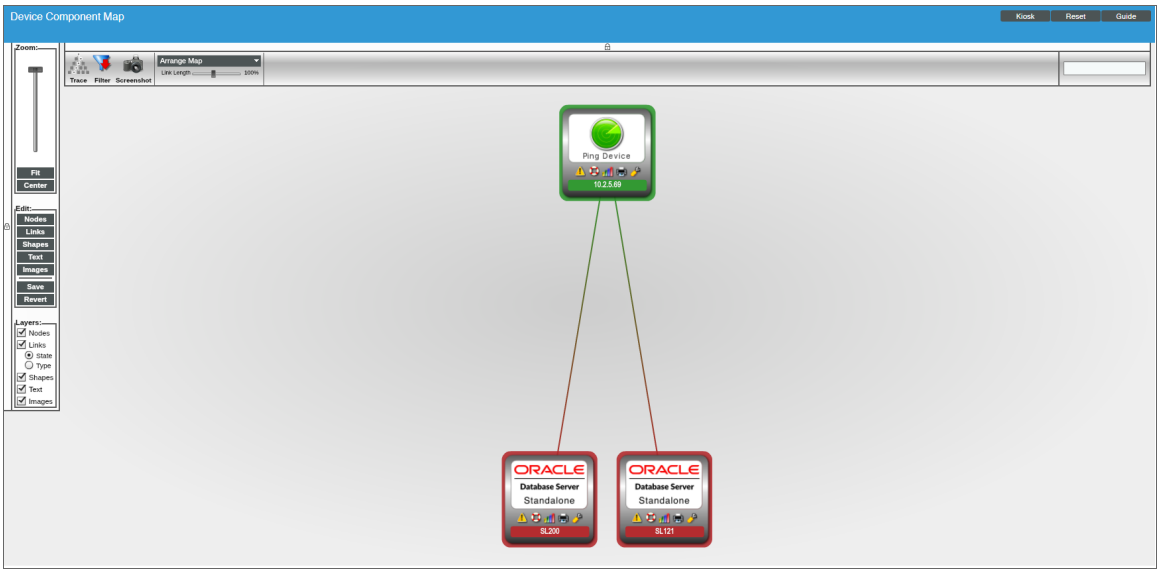
In addition to the **Device Manager** page (Registry > Devices > Device Manager), you can view the Oracle Database instances and all associated component devices in the following places in the user interface:

- 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.



Troubleshooting Discovery Issues

Oracle: Database v102 includes a check_oracle script for Discovery troubleshooting purposes. The script details information about any Discovery/Alignment issues that appear once a Support Escalation is opened.
To run the included check_oracle script for the PowerPack:

1. Ensure the script has executable permissions:
   ```
   >sudo chmod 744
   /opt/em7/envs/2BF4A4FD8DC2BA5EDDD565F9CF373156/lib/python2.7/site-
   packages/silo/oracle_db/check_oracle.py
   ```
2. Execute the script as user s-em7-core:
   ```
   >sudo -u s-em7-core
   /opt/em7/envs/2BF4A4FD8DC2BA5EDDD565F9CF373156/lib/python2.7/site-
   packages/silo/oracle_db/check_oracle.py
   ```
3. When the script has finished, provide the results file:
   ```
   /tmp/Oracle_results_10.1.2.3_1622740963
   ```

Chapter 3

Oracle: Database Dashboards

Overview

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

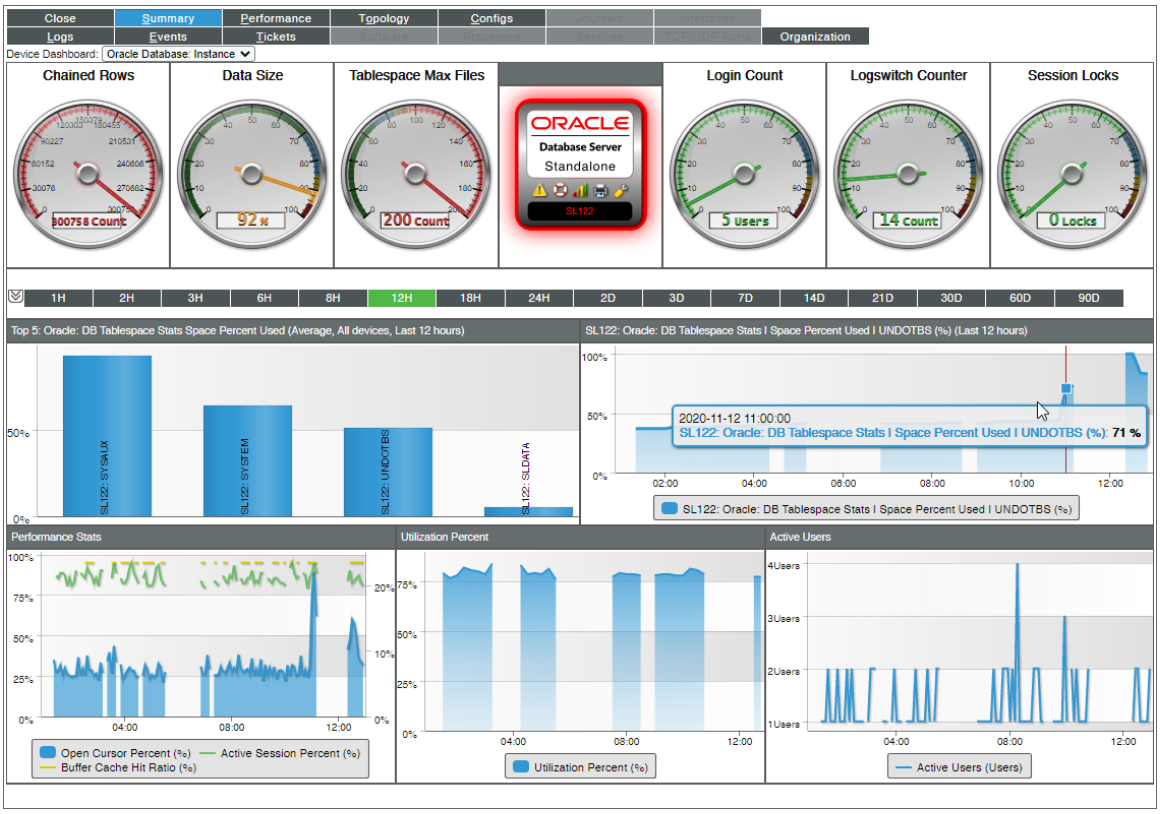
Device Dashboard ***36***

Oracle Database: Instance *37*

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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