Oracle® Cloud

Using Oracle Database Management for Autonomous Databases

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Preface

Using Oracle Database Management, you can perform tasks such as discovering Autonomous Databases in Oracle Management Cloud, monitoring their availability and performance, and loading data from an on-premises Oracle Database to an Autonomous Database.

Topics:

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Audience

This document is intended for Database Administrators and provides instructions on how to use Oracle Database Management for Autonomous Databases.

Documentation Accessibility

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

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Related Resources

For more information, see these Oracle resources:

*   Oracle Management Cloud Documentation
*   Oracle Cloud Infrastructure Documentation
*   *Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure*
*   *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*

Conventions

The following text conventions are used in this document.

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
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.

1
Introduction to Oracle Database Management

Oracle Database Management is built on Oracle Management Cloud's secure and unified data platform.

You can use Oracle Database Management for the following Oracle Databases:

- **Autonomous Databases**, which include:
  - **Autonomous Data Warehouse – Shared**. See About Autonomous Data Warehouse in *Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure*.
  - **Autonomous Transaction Processing – Shared**. See About Autonomous Transaction Processing in *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*.
- **On-premises Oracle Databases**, which also include the on-premises Oracle Databases harvested from Oracle Enterprise Manager to be monitored by Oracle Management Cloud offerings.

The chapters in this document provide high-level information on how to use Oracle Database Management to monitor your Oracle Databases on a single page and detailed information on how to:

- Set up Oracle Database Management and discover Autonomous Databases in Oracle Management Cloud.
- Monitor your Autonomous Database entities using Oracle Database Management and be alerted about issues and detect anomalies.
- Monitor the performance of your Autonomous Database entities on the **Performance Hub** page.
- Load data from an on-premises Oracle Database to an Autonomous Database.

2

Set Up Oracle Database Management for Autonomous Databases

Before you use Oracle Database Management for Autonomous Databases, you must perform certain prerequisite tasks, discover Autonomous Databases in Oracle Management Cloud, and assign the required privileges to users.

Topics:

- Before You Begin
- Perform Prerequisite Tasks
- Configure Oracle Database Management
- About Oracle Database Management User Roles

Before You Begin

Here are some common terms and concepts that you must be familiar with before you begin.

Oracle Management Cloud Terms

Term	Description
Alerts	Information generated in response to an availability issue or when a metric crosses its thresholds. Conditions for generating alerts are defined in Alert Rules. Alerts sent to administrators by using various channels, such as, email and SMS are known as **notifications**.
Alert Rules	A set of rules that define the conditions under which alerts are generated and notifications sent when an alert is raised. Alert conditions consist of a metric, a comparison operator, and thresholds against which metric values are evaluated.
Entities	Entities are monitored resources such as databases, host servers, compute resources, or application servers.
License Editions	License editions are predefined categories of Oracle Management Cloud offerings.

Oracle Cloud Infrastructure Terms

Term	Description
Bucket	A logical container used by Object Storage for storing your data and files.
Compartment	A collection of related resources such as virtual machines and databases.
Group	A collection of users who need the same type of access to a particular set of resources or compartment.

Term	Description
Object Storage	A storage architecture that allows you to store and manage data as objects.
Oracle Cloud Infrastructure Identity and Access Management (IAM)	Allows you to control what type of access a group of users have and to which specific resources.
Policy	A statement that defines access on a compartment to a given group.
Region	A localized geographic area in which Oracle Cloud Infrastructure is physically hosted.
Resource	The cloud object that you create and use when interacting with Oracle Cloud Infrastructure.
Tenancy	The root compartment that contains all of your organization's compartments and other Oracle Cloud Infrastructure resources.

For more information on Oracle Cloud Infrastructure terms, see Overview of Oracle Cloud Infrastructure Identity and Access Management in Oracle Cloud Infrastructure documentation.

Perform Prerequisite Tasks

As a Cloud Account Administrator, you must first perform the prerequisite tasks to set up Oracle Management Cloud to work with Oracle Cloud Infrastructure.

Before you perform the prerequisite tasks, you must ensure that the Autonomous Databases are created and available in Oracle Cloud Infrastructure, and in the same region as your Oracle Management Cloud instance. Cross-region monitoring of Autonomous Databases is currently not supported by Oracle Management Cloud. For information on how to create an Autonomous Database and the type of access required to create one, see Creating an Autonomous Database in Oracle Cloud Infrastructure documentation.

The following table provides a workflow of the prerequisite tasks.

Task	Description	More Information
Sign in to the Oracle Cloud Infrastructure Console	After you sign up for Oracle Cloud, you receive a welcome email. Use the credentials available in the welcome email and sign in to the Oracle Cloud Infrastructure Console.	See Sign In to the Oracle Cloud Infrastructure Console in *Getting Started with Oracle Management Cloud*.
Create an Oracle Management Cloud instance	Create an Oracle Management Cloud instance on the Instance Management page. You must ensure that your Oracle Management Cloud instance and your Autonomous Databases are available in the same region.	See Create an Oracle Management Cloud Instance in *Getting Started with Oracle Management Cloud*.

Task	Description	More Information
Add users and assign roles	Add users and assign Oracle Management Cloud user roles in the Oracle Cloud Infrastructure Console. You must ensure that you assign the OMC Administrator role to one or more users as only a user assigned this role can perform the tasks to configure Oracle Database Management and discover Autonomous Databases. Users assigned the OMC User role can work with Autonomous Databases in Oracle Management Cloud if they're also assigned the necessary privileges on the **Access Policies** page in Oracle Management Cloud.	See Add Users and Assign Roles in *Getting Started with Oracle Management Cloud*.
Create an Identity Cloud Service (IDCS) user group	Create an IDCS user group in the Oracle Cloud Infrastructure Console, for example, *OMC_ADB_Admin*, and add the users to this group. You must ensure that you add one or more users with the OMC Administrator role to this group.	See Managing Oracle Identity Cloud Service Groups in the Console in Oracle Cloud Infrastructure documentation.
Create an IAM group and assign a policy	Create an IAM group in Oracle Cloud Infrastructure Console and assign a policy to discover Autonomous Databases. The name of the IAM group could be the same as the name of the IDCS user group, *OMC_ADB_Admin*, and an example of a recommended policy is: `Allow group OMC_ADB_Admin to READ autonomous-data-warehouse-family in tenancy where request.region= 'phx'.` In this example, phx denotes the Phoenix region.	• See To create a group in Oracle Cloud Infrastructure documentation. • See To create a policy in Oracle Cloud Infrastructure documentation.
Map the IDCS user group to the IAM group	Map the IDCS user group to the IAM group to provide access to the Autonomous Databases from Oracle Management Cloud. Note that the mapping of an IDCS user group with an IAM group is required if the IDCS user group has users with the OMC Administrator role. This is required to allow the OMC Administrator to discover the Autonomous Databases in the Oracle Cloud Infrastructure Console from Oracle Management Cloud. If an IDCS user group only has users with the OMC User role, then the user group doesn't have to be mapped with an IAM group.	See To map an Oracle Identity Cloud Service group to an Oracle Cloud Infrastructure group in Oracle Cloud Infrastructure documentation.

Configure Oracle Database Management

As the assigned OMC Administrator, you must perform the tasks listed in the following table to configure Oracle Database Management to work with Autonomous Databases.

For information on the OMC Administrator role and the tasks a user assigned this role can perform, see About Oracle Database Management User Roles.

Task	Description	More Information
Access Oracle Management Cloud console	Access Oracle Management Cloud console from the Instance Management page.	See Access Oracle Management Cloud Console in *Getting Started with Oracle Management Cloud*.
Discover Autonomous Databases in Oracle Management Cloud	Create a Cloud Discovery Profile for the Oracle Cloud Infrastructure tenancy or compartment that has the Autonomous Databases and discover them in Oracle Management Cloud.	See Discover Autonomous Databases.
Access policies to assign Autonomous Database related privileges	After you discover Autonomous Databases, you must go to the **Access Policies** page in Oracle Management Cloud and assign privileges to enforce user access. **Note:** The tasks performed on the Access Policies page are only applicable when working with Autonomous Databases.	See Access Policies to Assign Autonomous Database Related Privileges.

Task	Description	More Information
Review Oracle Management Cloud license information	Oracle Database Management for Autonomous Databases is bundled with the Autonomous Databases. After you discover the Oracle Cloud Infrastructure tenancy or compartment in Oracle Management Cloud, the Oracle Management Cloud – Standard Edition is automatically assigned to the Autonomous Database entities in the tenancy or compartment, and you can use all the available Oracle Database Management functionalities for Autonomous Databases at no additional cost. **Note:** You can also enable: • The Oracle Management Cloud – Enterprise Edition and use Oracle IT Analytics for Autonomous Databases. You can use Oracle IT Analytics' Database Performance Analytics, Database Resource Analytics, and SQL Analytics applications to: – Obtain insights and forecasts related to performance and resource utilization, based on long term data. – Identify degrading and inefficient workloads. – View the degrading SQLs, variant SQLs, inefficient SQLs, and SQLs with plan changes. – Detect the databases projected to reach capacity headroom limit. – Forecast future requirements of database CPU, I/O, and storage. For more information, see the following sections in *Using Oracle IT Analytics*. – Maximize Database Performance – Analyze Database Resources – Analyze SQL Performance • The Oracle Management Cloud – Log Analytics Edition and monitor Autonomous Database logs. See Set Up Autonomous Database Log Collection in *Using Oracle Log Analytics*.	See Oracle Management Cloud License Information in *Getting Started with Oracle Management Cloud.*

Discover Autonomous Databases

To discover Autonomous Databases, you must access Oracle Management Cloud with the OMC Administrator role and create a Cloud Discovery Profile for the Oracle Cloud Infrastructure tenancy or compartment in which the Autonomous Databases reside.

The Cloud Discovery Profile defines the account information required to discover the Autonomous Databases in Oracle Cloud Infrastructure and add them as entities in Oracle Management Cloud. Monitoring of Autonomous Databases starts automatically as soon as the profile is created, and every 15 minutes Oracle Management Cloud checks to see if new Autonomous Databases are added to the compartments in Oracle Cloud Infrastructure and discovers them for monitoring. Similarly, when an Autonomous Database is deleted from the compartment in Oracle Cloud Infrastructure, it's deleted from Oracle Management Cloud too. Once the Autonomous Databases are discovered, and the status and performance metrics have been

collected, monitoring features such as alerting and notifications are automatically applied.

Prerequisites: Before you create a Cloud Discovery Profile, you must ensure that:

- Your Autonomous Databases are created and available in the same region as your Oracle Management Cloud instances. Cross-region monitoring of Autonomous Databases is currently not supported by Oracle Management Cloud.

- You have access to the compartments in which your Autonomous Databases reside in Oracle Cloud Infrastructure. See Perform Prerequisite Tasks.

- You've obtained the following credentials from the Oracle Cloud Infrastructure Console as Oracle Management Cloud connects to your Oracle Cloud Infrastructure tenancy using APIs.

    – Tenancy's OCID and User's OCID. See Where to Get the Tenancy's OCID and User's OCID in Oracle Cloud Infrastructure documentation.

    – Private Key and Public Key in PEM format. See How to Generate an API Signing Key in Oracle Cloud Infrastructure documentation.

    – Fingerprint of the Public Key. See How to Get the Key's Fingerprint in Oracle Cloud Infrastructure documentation.

To discover your Oracle Cloud Infrastructure compartment with Autonomous Databases:

1. In the Oracle Management Cloud console, click **OMC Navigation** ≡ on the top-left corner to view the **Management Cloud** navigation menu, if it isn't already displayed.

2. Click **Administration** > **Discovery** > **Cloud Discovery Profiles**.

3. On the **Cloud Discovery Profiles** page, click **Add Profile**.

   The **Add Discovery Profile** page is displayed.

4. On the **Add Discovery Profile** page, enter a profile name and select **Oracle Cloud Infrastructure** in the **Cloud Service Provider** drop-down list.

5. In the **Regions and Services** section, select your region and select the following Autonomous Database options in the **Services** drop-down list:

    - **Autonomous Data Warehouse**

    - **Autonomous Transaction Processing**

6. In the **Credentials** section, select the **New Credentials** option and enter the following credentials:

    - A name for the credentials account, which acts as a unique identifier for these credentials in Oracle Management Cloud.

    - Oracle Cloud Infrastructure tenancy-related information: **User OCID**, **Tenancy OCID**, **Private Key**, and **Fingerprint**. If you've encrypted a passphrase when generating the private key, then enter it in the **Passphrase** field. For information on these fields, see the prerequisites mentioned earlier in this section.

7. Click **Start Discovery**.

The Cloud Discovery Profile is saved and the status of the discovery is displayed on the **Cloud Discovery Profiles** page.

Access Policies to Assign Autonomous Database Related Privileges

After the Autonomous Database entities are discovered, you must go to the **Access Policies** page in Oracle Management Cloud and assign privileges to enforce user access.

> **Note:**
>
> The tasks performed on the Access Policies page are only applicable when working with Autonomous Database entities in Oracle Management Cloud. Similarly, the following information on Role-Based Access Control standards is only applicable when working with Autonomous Database entities.

The Autonomous Databases reside either within a tenancy, which is the root compartment, or in other compartments within the tenancy in Oracle Cloud Infrastructure. After you discover an Autonomous Database entity, Oracle Management Cloud has the information regarding the compartment in which the entity resides and you must apply the Role-Based Access Control (RBAC) standard to enforce user access based on the user's role. RBAC secures access using the following approach:

"*Who* can perform *what* functions on *which* resources."

- *Who* denotes the IDCS user group you want to grant access privileges to.

- *What* denotes the actions the user group can perform.

- *Which* denotes the compartments in which the Autonomous Databases reside.

Prerequisites: You can access policies and assign them to users in Oracle Management Cloud. However, before you do so, ensure that:

- You've performed the prerequisite tasks listed in Perform Prerequisite Tasks.

- You've been assigned the OMC Administrator role and you're a part of the IDCS user group to which you want to assign a policy.

- You've discovered the Autonomous Databases in Oracle Management Cloud.

To assign policies to user groups:

1. In the **Management Cloud** navigation menu, click **Administration** > **Security** > **Access Policies**.

   The **Access Policies** page is displayed.
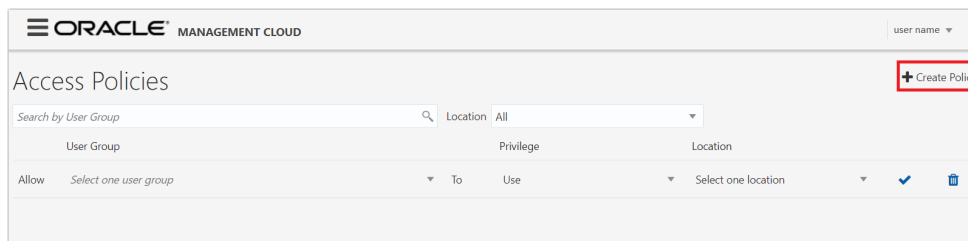
2. On the **Access Policies** page, click **Create Policy**.

3. Select an IDCS user group from the **User Group** drop-down list, the **Use** or **Manage** privilege from the **Privilege** drop-down list, and the compartment which has the Autonomous Databases from the **Location** drop-down list.

   The user groups populated in the **User Group** drop-down list are the IDCS groups you created when performing the prerequisite tasks.

   Use and **Manage** are the two verbs in the policy statement that grant the privileges required to work with Autonomous Database entities in Oracle Database Management. Note that for users with the OMC User role to perform monitoring and other tasks on an Autonomous Database entity, they must be in a user group that is assigned the **Manage** privilege. If a user group is assigned the **Use** privilege, then only the OMC Administrator in that group has access to Oracle Database Management and can perform monitoring and other tasks on an Autonomous Database entity.

4. Click **Create Policy** ✔ against the policy.

The policy is assigned to the user group.

If you assign the Manage privilege to G1 for the resources in C1, then all the users in this user group will be able to access Oracle Database Management and work with the two Autonomous Databases in C1. However, if G1 is assigned the Use privilege, then only you (OMC Administrator) will be able to access Oracle Database Management and work with the Autonomous Databases in C1.

About Oracle Database Management User Roles

The following table lists Oracle Management Cloud user roles and the tasks you can perform to configure and use Oracle Database Management to monitor Autonomous Database entities, when assigned these roles.

Role	Task
OMCEXTERNAL_ENTITLEMENT_ADMINISTRATOR	A user assigned this role creates Oracle Management Cloud instances.
OMC Administrator	A user assigned this role accesses Oracle Management Cloud console and performs the following initial configuration tasks such as: • Creating a Cloud Discovery Profile and discovering Autonomous Databases in Oracle Management Cloud, and deleting a Cloud Discovery Profile. • Enabling and disabling Oracle Management Cloud licenses. • Assigning policies to user groups. A user assigned this role can access all Oracle Database Management pages and perform all monitoring and other tasks.
OMC User	A user assigned the OMC User role must further be added to an IDCS user group, which is assigned one of the following privileges in a user access policy on the **Access Policies** page in Oracle Management Cloud: • If an OMC User is a part of an IDCS user group that has been assigned the Manage privilege, then the OMC User can access Oracle Database Management and perform all monitoring and other tasks such as: – Monitoring the Oracle Databases on the **Oracle Database Fleet Home** page. – Reviewing and investigating alerts – Setting Resource Management Rules for Autonomous Database entities. – Going to the **Performance Hub** page to investigate and diagnose performance issues of Autonomous Database entities. – Loading data from an on-premises Oracle Database to an Autonomous Database on the **Data Movement** page. • If an OMC User is a part of an IDCS user group that has been assigned the Use privilege, then the OMC User does not have access to Oracle Database Management and cannot perform any tasks.

3
Monitor the Overall Health of Your Oracle Database Fleet

As a Database Administrator, monitoring your Oracle Databases' availability and performance is an important part of your job. Oracle Database Management provides a unified view of your database entity estate or *fleet* on the **Oracle Database Fleet Home** page.

On the Oracle Database Fleet Home page, you have a single-pane-of-glass view of:

- Autonomous Database (Autonomous Data Warehouse and Autonomous Transaction Processing) entities, which you've discovered to be monitored using Oracle Database Management.

- On-premises Oracle Database entities, which you've added to be monitored using Oracle Database Management or other Oracle Management Cloud offerings such as Oracle Infrastructure Monitoring.

To go to the Oracle Database Fleet Home page, click **Database Management** on the Oracle Management Cloud Home page or **Oracle Database** in the **Management Cloud** navigation menu. The Oracle Database Fleet Home page is displayed and the following tiles provide important status and performance information about your Oracle Database entities:

- **Overview**: Displays the number of Oracle Database entities in your fleet and their availability status.

- **Fleet Distribution**: Displays the distribution of the Autonomous Database and on-premises entities in your fleet.

- **Alerts**: Displays the number of alerts for the Oracle Database entities in your fleet, if any.

- **Performance**: Displays the performance of the Oracle Database entities in your fleet.

- **Fleet Members**: Displays the list of all the Oracle Database entities in your fleet with their Name, Type, Status, Region, and Version.

Topics:

- Investigate Alerts
- Assess the Performance of Your Fleet at a Glance
- Filter and Customize Your View

Investigate Alerts

Alerts help keep your Autonomous Database entities up and running by notifying you of issues, so you can take remedial action.

You can proactively review and investigate the alerts for all your Oracle Database entities on the **Alerts** tile on the **Oracle Database Fleet Home** page. The Alerts tile displays the total number of new and pre-existing alerts over the last 24 hours and a break down of the alerts based on severity. If you want to view and investigate alerts for a specific entity in your fleet, go to the Database Home page. See Monitor a Specific Autonomous Database.

Alerts are generated either:

- Automatically, for all availability issues, for example, when an Autonomous Database entity is down. No alert rule is required to generate these alerts.

- Based on custom alert rules that specify a condition, such as the Fixed Threshold condition to generate an alert when a metric exceeds a set metric threshold value. For information on how to create an alert rule and set up alert thresholds and notifications, see Set Up Alert Rules in *Using Oracle Infrastructure Monitoring*.

To proactively investigate alerts:

1. Go to the **Oracle Database Fleet Home** page.

2. On the **Alerts** tile, click the **Alerts** link.

   The alerts for all your entities are displayed on the **Alerts** page.

3. Use the **Service**, **Severity**, **Alert Type**, **Entity Type**, and **Search** fields to filter and view relevant alerts.

   For example, if you want to view the alerts for your Autonomous Data Warehouse entity, select **Monitoring** in the **Service** drop-down list, **All** in the **Severity** and **Alert Type** drop-down lists, and **Autonomous Data Warehouse** in the **Entity Type** drop-down list.

   The alerts for the Autonomous Data Warehouse entity are displayed and the information on the **Alerts** page gives you enough context to start investigating the issues. This information includes:

   - A high-level overview of the total number of alerts and the severity of the alerts. Alert severity is a key component of an alert that translates into the following:

     – **Fatal**: An entity is down.

     – **Critical**: A metric has crossed a critical threshold.

     – **Warning**: A metric has crossed a warning threshold.

   - A detailed description of each alert, which includes:

     – The **severity** of the alert.

     – The alert **message**. You can click the alert message for more details such as when the alert was created, updated, and alert history.

     – The **entity name** and **entity type**.

     – The date and time when the alert was **last updated**.

- The **duration** of time since the alert was first reported.

4. After you investigate the alert, take the necessary steps to resolve the issue.

Assess the Performance of Your Fleet at a Glance

You can monitor and assess the performance of your fleet of Oracle Database entities on the **Performance** tile on the **Oracle Database Fleet Home** page.

The performance data of your fleet can be viewed on an advanced **Heat Map** or a **List** view and you can select the view in the **View is** drop-down list.

The Heat Map view is a visual representation of your fleet's performance for a selected performance metric, which makes the information easy to interpret. Using the heat map you can easily identify the Autonomous Database or on-premises Oracle Database entity that needs your attention on various dimensions such as DB Time, Execution Rate, and so on.

To view the performance of your fleet for a selected metric on a heat map:

1. Go to the **Oracle Database Fleet Home** page.

2. On the **Performance** tile, ensure that **Heat Map** is selected in the **View is** drop-down list.

3. Click the **Metric** drop-down list and select a performance metric, for example **DB Time (sec)**.

   The heat map is updated and the size of the box assigned to each entity denotes the current value of the selected metric and the color denotes the percentage change from the average metric value over the last 24 hours. For example, if **DB Time (sec)** is selected in the **Metric** drop-down list and a particular Autonomous Database entity is represented in a big red box on the **Performance** heat map, then the entity's DB time and the rate of change from the average over the last 24 hours are high.

4. Optionally, click the **Group By** drop-down list to group your entities by **Region**.

On the Performance heat map, you can click an Oracle Database entity to go to the Database Home page for that entity.

Filter and Customize Your View

Oracle Database Management provides advanced filtering options to filter, customize, and view the data relevant to you on the **Oracle Database Fleet Home** page.

Use the Filter Pane

Using the options available on the **Filter** pane, you can categorize and view the Oracle Database entities in your fleet by Status, Fleet Distribution, Region, and Version.

To filter the data displayed on the Oracle Database Fleet Home page and save a filter:

1. Go to the **Oracle Database Fleet Home** page.

2. Click **Filter** to view the database filtering criteria.
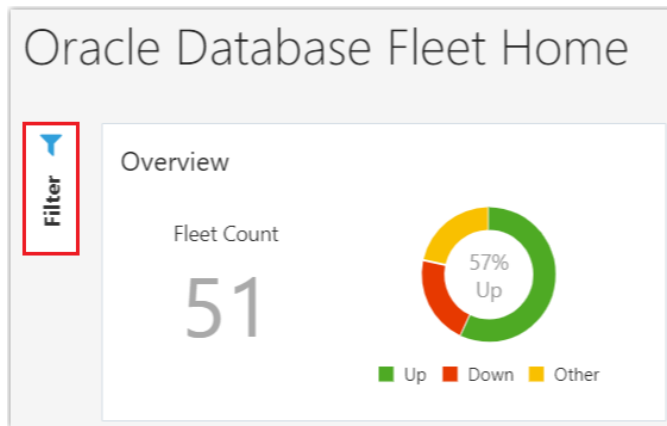
3. Select the filtering criteria you want to use and click **Apply**.
   For example, on the **Filter** pane, if you select **Up** in the **Status** options, **ADW** in the **Fleet Distribution** options, **Ashburn** in the **Region** options, and **18.0.0.0.0** in the **Version** options, and click **Apply**; only the 18.0.0.0.0 Autonomous Data Warehouse entities in Ashburn, whose status is Up, are displayed on the **Oracle Database Fleet Home** page.

4. Click **Save** to save the filter.
   In the **Save Filter** dialog box, enter a name for the saved filter. If you select the **Remember performance metric** option, then the **Metric** and **Group By** options selected on the **Performance** tile are also saved.

To view the saved filter, click **Saved** on the **Filter** pane. After you apply a filter or select a previously saved filter, the data pertaining to the selected filter criteria is displayed on the **Oracle Database Fleet Home** page.

Use the Global Entity Selector

You can use the **Global Entity Selector** to filter the data displayed on the **Oracle Database Fleet Home** page.

To do so, enter and select the entity in the **Global Entity Selector**.

The data on the **Oracle Database Fleet Home** page is filtered to only display the data related to the selected Oracle Database entity.

4

Monitor a Specific Autonomous Database

Detailed information about an Autonomous Database entity in your fleet is displayed on the corresponding Database Home page.

To go to the Database Home page of an entity, click the entity tile on the **Performance** heat map or the name of the entity in the **Fleet Members** section on the **Oracle Database Fleet Home** page.

The following tiles are displayed on the Database Home page of an Autonomous Database entity:

- **Overview**: Displays information on the Version, Creation Date, CPU, and Region.

- **Alerts**: Displays alerts for the specific Autonomous Database entity, if any. If you have alerts, click the **Alerts** tile to go to the **Alerts** page. The alerts for the Autonomous Database entity are displayed.

- **Storage**: Displays a summary of space usage in a horizontal bar chart.

- **Audit Log Actions**: Displays the failed and successful audit actions performed on the Autonomous Database entity in a donut chart.

- **Performance**: Displays the Database Activity by various dimensions such as CPU and User I/O. The time period and other information is pulled in from the **Performance Hub** and you can click the **Performance** tile to go to the **Performance Hub** page. See Monitor and Diagnose the Performance of Autonomous Databases.

- **Resources**: Displays the CPU and Memory utilization of the entity in a vertical bar chart.
  The CPU utilization parameters for Autonomous Database entities correspond to the predefined service names that provide different levels of performance and concurrency. For more information, see:
  - Predefined Database Service Names for Autonomous Data Warehouse in *Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure*

  - Predefined Database Service Names for Autonomous Transaction Processing in *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*

- **SQL Monitor**: Click **SQL Monitor** > **Monitored** to view a list of SQL statements that are currently running or are completed. Click **Running & Queued** to view graphs of running and queued SQL statements in the last one hour.

On the Database Home page of an Autonomous Database entity, you can also click the **Actions** menu on the top-right of the page and then click **Resource Management Rules** to set resource management rules.

Topics:
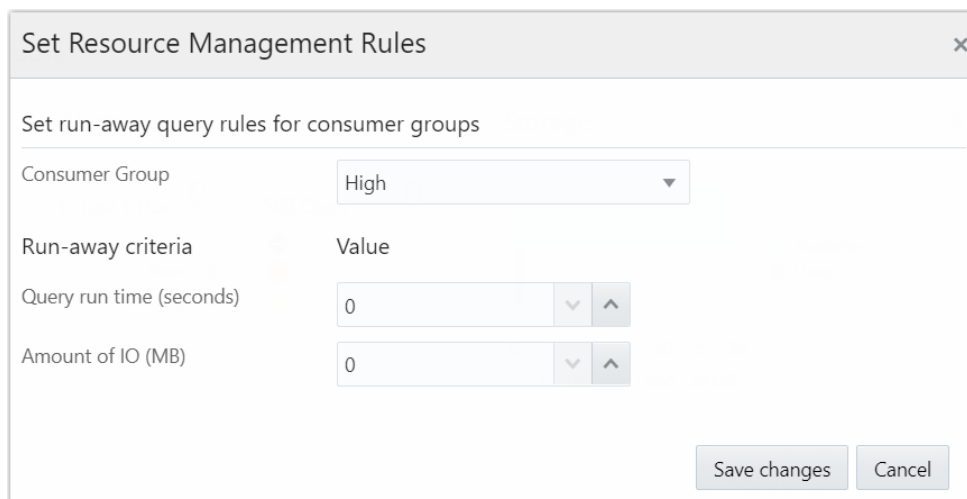
- Set Resource Management Rules for Autonomous Databases
- Use an Entity Card to Explore Database Information

Set Resource Management Rules for Autonomous Databases

You can configure Autonomous Database entities to automatically terminate SQL statements based on their run time or the amount of I/O.

1. Go to the Database Home page of the Autonomous Database entity.

2. Click the **Actions** drop-down list on the top-right corner and click **Resource Management Rules**.

   The **Set Resource Management Rules** dialog box is displayed.

3. Set run-away query rules for consumer groups:

   • Select **High**, **Medium**, or **Low** in the **Consumer Group** drop-down list.

   • Set run-away criteria values for **Query run time** and **Amount of IO**.

4. Click **Save changes**.

   The resource management rules for an Autonomous Database entity are now successfully set. For example, if you've selected **High** in the Consumer group drop-down list, set the query run time to **120 seconds**, and the I/O limit to **1000 MB**, then a SQL statement in the High consumer group is terminated if it exceeds the 120 second run time limit or the 1000 MB I/O amount limit.

Use an Entity Card to Explore Database Information

You can use the Entity Card to view information related to Autonomous Database entities, in the form of histograms.

On an entity card, you can easily access the information related to a particular database entity in your fleet, instead of going to other views or performing a separate search. To view the entity card, you can either go to the **Oracle Database Fleet Home** page, hover the mouse on the entity in the **Fleet Members** section, and click the **View More** icon on the pop-up; or as shown in the following image, go to the Database

Home page of the entity, hover the mouse over the name of the entity in the **Global Entity Selector**, and click the **View More** icon on the pop-up.
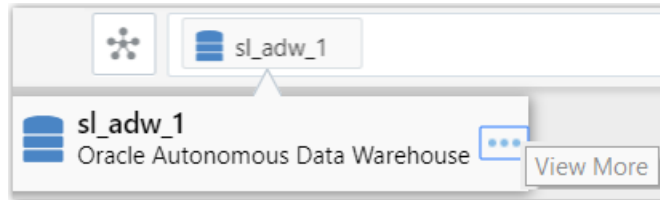
The entity card of an Autonomous Database entity displays the status, alerts, and other information such as CPU utilization, SQL service response time, and transaction rates.
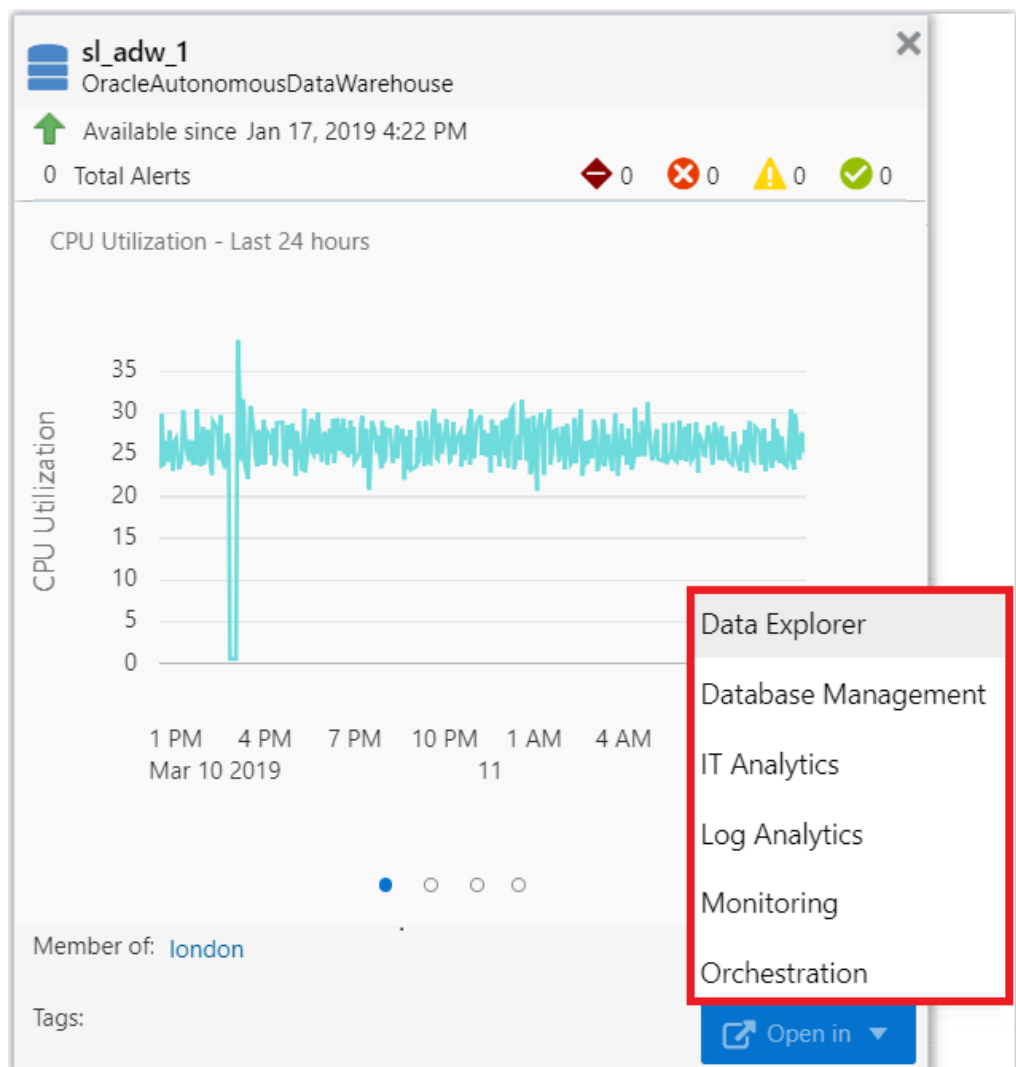
Click the **Open in** drop-down list on the Autonomous Database's entity card and select one of the available Oracle Management Cloud offerings to navigate to that offering and use it to monitor the Autonomous Database.

You'll notice that when you go to another Oracle Management Cloud page from the entity card, the name of the entity is displayed in the **Global Entity Selector** on top of the page and the information on the page is within the context of that entity.

5
Monitor and Diagnose the Performance of Autonomous Databases

On the **Performance Hub** page in Oracle Database Management, you can monitor the performance of your Autonomous Database entities and ensure that these entities perform optimally.

This page allows you to view all the performance data available for a specific time period. Once a time period is selected, the database performance is displayed.

To go to the Performance Hub of an Autonomous Database entity, click the **Performance** tile on the Database Home page of the entity or **Performance Hub** in the **Oracle Database** navigation menu.

The Performance Hub consists of the following sections:

- **Time Selector** field and **Time Range**:
  The Time Selector field is displayed on the top-right corner and performance data for the time selected in this field is displayed on the Performance Hub. By default, **Last 60 mins** is selected in this field.

  The Time Range on the Performance Hub shows the Active Sessions chart for the time period selected in the Time Selector field. The Active Sessions chart displays the average number of active sessions broken down by **Wait**, **User I/O**, and **CPU**. You can use the **Time Range Slider** to select a shorter period of time for which data is displayed on the Performance Hub, and this is a subset of the period of time selected in the Time Selector field.

- **ASH Analytics** tab:
  The ASH Analytics tab shows Active Session History (ASH) analytics charts to explore ASH data. It allows you to drill down into database performance across multiple dimensions such as **Consumer Group**, **Wait Class**, **SQL ID**, and **User Name**. On the ASH Analytics tab, you can perform tasks such as:

  - Selecting an Average Active Sessions dimension and viewing the top activity for that dimension for the selected time period. For information on ASH, see Active Session History (ASH) in *Oracle Database Concepts*.

  - Generating an Automatic Workload Repository (AWR) report. For information on AWR, see Automatic Workload Repository (AWR) in *Oracle Database Concepts*.

- **SQL Monitoring** tab:
  The SQL Monitoring tab is not displayed by default and to view it, click **SQL Monitoring** on the Performance Hub.

  The SQL Monitoring tab enables real-time SQL monitoring and allows you to view long running SQL statements in your Autonomous Database. On this tab, you can drill down into individual SQL statements, view the execution plan and the amount of database time being used by each SQL execution plan line, and identify and analyze resource intensive SQL statements. Note that SQL statements are only monitored if they've been running for at least five seconds or if they're run in parallel.

The table on this tab displays monitored SQL statement executions by dimensions such as **Last Active Time**, **CPU Time**, and **Database Time**. The columns in the table provide information such as **Status**, **Duration**, and **SQL ID**.

The **Status** column has the following icons:

– A green spinning icon indicates that the SQL statement is executing.

– A red cross icon indicates that the SQL statement did not complete either due to an error or due to the session getting terminated.

– A check mark icon indicates that the SQL statement completed its execution during the specified time period.

– A clock icon indicates that the SQL statement is queued.

To analyze a SQL statement, click the SQL ID to go to the corresponding **Monitored SQL Execution Details** page. You can use the information available on this page to tune the SQL statement.

If a SQL statement is running or queued and you want to terminate the session, click **Kill Session** on the SQL Monitoring tab.

• **Workload** tab:
The Workload tab is not displayed by default and to view it, click **Workload** on the Performance Hub.

The Workload tab displays charts of the various metrics supported for Autonomous Databases, which enable a quick interpretation of data.

Topics:

• View Average Active Sessions Data by a Selected Dimension

• Filter Average Active Sessions Data

• Generate AWR Reports to Diagnose Performance Issues

• Monitor Workload Metrics

View Average Active Sessions Data by a Selected Dimension

You can select an average active sessions dimension such as **Consumer Group**, **Wait Class**, or **Instance** and view the top activity for that dimension for the selected time period.

1. Go to the **Performance Hub**.

   • The Autonomous Database entity name is displayed in the **Global Entity Selector** field.

   • The time period for which information is available on the Performance Hub is displayed in the **Time Selector** field and the selected time period is displayed on the **Time Range**.

   • The **ASH Analytics** tab is displayed with the top activity for a selected dimension in the selected time period.

2. Select the time in the **Time Selector** field on the top-right corner of the **Performance Hub**.

3. Use the **Time Range Slider** to further narrow down the time period for which performance data is displayed on the **ASH Analytics** tab.

4. Select a dimension in the **Average Active Sessions by** drop-down list to display ASH analytics by that particular dimension. By default, the **Consumer Group** dimension is selected and the data is categorized by the **High**, **Medium**, or **Low** service name associated with the Autonomous Database entity.

   Optionally, you can:

   • Select **Max CPU (cores)** to view the number of CPU cores. The CPU cores are denoted by a red line on the chart.

   • Select **Total Activity** to view a black border that denotes total activity of all the components of the selected dimension on the chart. This option is selected by default when you use the filtering capabilities to only view the data for a particular component within a dimension. For information on filtering Average Active Sessions data, see Filter Average Active Sessions Data.

5. For the dimension selected in the **Average Active Sessions by** drop-down list, you can further drill down into session details by selecting dimensions in the two sections at the bottom of the **ASH Analytics** tab. By default, the following dimensions are selected:

   • **SQL ID By Consumer Group**, which displays the SQL statements with the top average active sessions activity for consumer groups for the selected time period. You can right-click the bar charts to sort the SQL statements in ascending or descending order or click the SQL ID to go the SQL Details page.

   • **User Session By Consumer Group**, which displays the user sessions with the top average active sessions activity for consumer groups for the selected time period. You can right-click the bar charts to sort the user sessions in ascending or descending order or click the user session to go to the User Session page.

Filter Average Active Sessions Data

The Average Active Sessions data is displayed by the dimension selected in the drop-down list. To analyze the data better, you can further filter the data displayed on the chart by the various components displayed in the legend to the right of the chart.

1. Go to the **Performance Hub**.

2. In the **ASH Analytics** tab, select a dimension in the **Average Active Sessions by** drop-down list. By default, **Consumer Group** is selected.

   The chart is displayed and each color in the chart denotes a component of the selected dimension. These components are also listed in a legend to the right of the chart. For example, the Consumer Group dimension has **High**, **Medium**, and **Low**, which are predefined service names assigned to your Autonomous Database entity to provide different levels of concurrency and performance.

3. Click a component in the legend.

   The selected component is displayed in the **Applied Filters** field and the chart is updated to only display data pertaining to that component. The total activity, which includes all the components of the dimension, is denoted by a black outline and is displayed by default when you filter data.
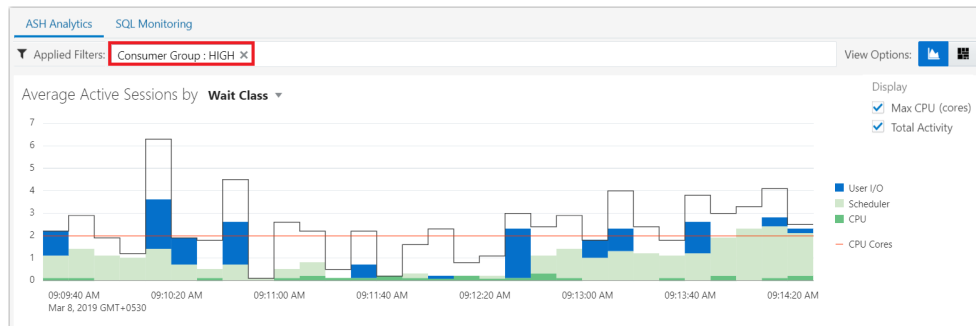
Generate AWR Reports to Diagnose Performance Issues

You can generate an AWR report on the Performance Hub. An AWR report has data on database activity between two points in time – two snapshots. It has many different sections with a large amount of database performance data. You can use this information to compare statistics captured during a period of bad performance to a baseline, and diagnose performance issues.

> **Note:**
>
> You cannot generate AWR reports if you're using Performance Hub in the Oracle Cloud Infrastructure console. For information on using Performance Hub in the Oracle Cloud Infrastructure console, see:
>
> - Monitor Autonomous Data Warehouse with Performance Hub in *Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure*
>
> - Monitor Autonomous Transaction Processing with Performance Hub in *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*

1. Go to the **Performance Hub**.

2. In the **ASH Analytics** tab, right-click on the Average Active Sessions chart and click **Generate AWR Report**.
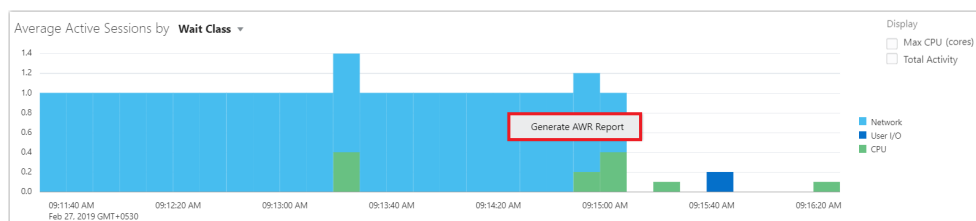
3. In the **Generate AWR Report** dialog box, either select the default option, which is to generate an AWR report for the database activity between the two snapshots closest to the current time, or select a custom time range, and click **Generate Report**.

The AWR report is generated in HTML format and has links that can be used to navigate quickly between sections. To view a previously generated AWR report, click **Reports** > **View Stored Reports** on the top-right side of the **Performance Hub**.

Monitor Workload Metrics

On the Workload tab, you can monitor the various metrics supported for Autonomous Databases.

The metrics are displayed in the following charts:

*   CPU Statistics

*   Wait Time Statistics

*   Workload Profile

*   Sessions

On these charts you can view a metric by selecting it from the drop-down list above the chart. For example, on the **CPU Statistics** chart, you can view the **CPU Utilization (%)** and **CPU Usage** metrics.
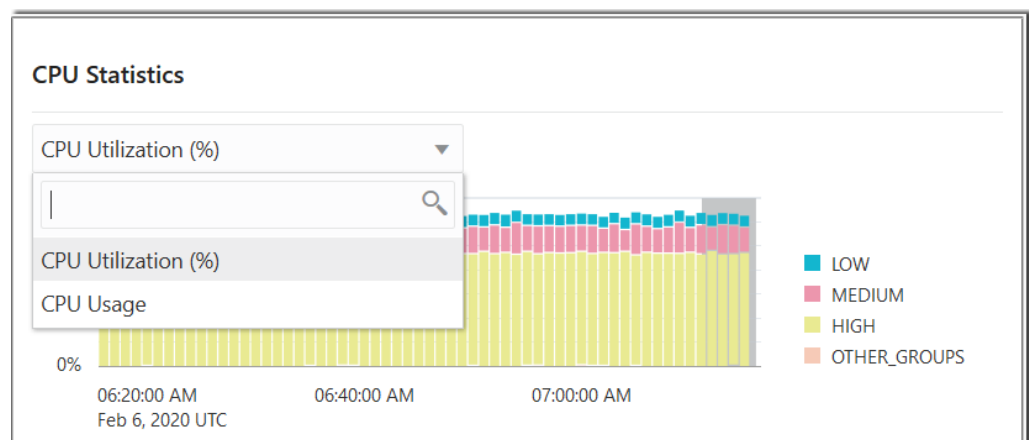
The following table lists and provides more information on all the metrics that can be monitored on the Workload tab.

Chart	Metric	Unit	Description
CPU Statistics	CPU Utilization (%)	Percentage	The CPU utilization expressed as a percentage, aggregated across all consumer groups. This metric is reported based on the number of CPUs the database is allowed to use, which is two times the number of OCPUs.
	CPU Usage	Seconds per second	The average rate of accumulation of CPU time by foreground sessions in the database over the time interval. This is the CPU time component of Average Active Sessions.
Wait Time Statistics	Wait Time Statistics	Seconds per second	The average rate of accumulation of non-idle wait time by foreground sessions in the database over the time interval. This is the wait time component of Average Active Sessions.

Chart	Metric	Unit	Description
	Database Time	Seconds per second	The average rate of accumulation of database time (CPU + Wait) by foreground sessions in the database over the time interval. This is also known as Average Active Sessions.
Workload Profile	User Calls	Per second	The combined number of logons, parses, and execute calls per second.
	Executions	Per second	The number of user and recursive calls that executed SQL statements per second.
	Transactions	Per second	The combined number of user commits and user rollbacks per second.
	Parse Count	Per second	The number of hard and soft parses per second.
	Running Statements	Per second	The number of running SQL statements aggregated across all consumer groups per second.
	Queued Parallel Statements	Per second	The number of queued parallel SQL statements aggregated across all consumer groups per second.
Sessions	Session Count	Per second	The number of sessions in the database per second.
	Current Logons	Per second	The number of successful logons per second.

6

View and Edit Autonomous Database Initialization Parameters

Initialization parameters are configuration parameters that impact the basic operation of a database.

Autonomous Databases configure the database initialization parameters based on the compute and storage capacity you provision. You don't have to set any initialization parameters, however, you can edit a limited set of parameters if you need to on the **Initialization Parameters** page.

To go to the Initialization Parameters page, go to the Database Home page of an Autonomous Database entity and click **Initialization Parameters** in the **Oracle Database** navigation menu. The editable initialization parameters of your Autonomous Database entity are displayed in a table format with the following columns:

- **Name** of the initialization parameter.

- **Value** of the initialization parameter such as TRUE and FALSE.

- **Comment** added for the initialization parameter.

- **Dynamic** has a green check mark that denotes a dynamic parameter. The parameters without a green check mark are static parameters.

- **Type** denotes the data type of the parameter value, such as Boolean or String.

- **Description** of the initialization parameter.

For information on the initialization parameters that are displayed on the Initialization Parameters page, see:

- Restrictions for Database Initialization Parameters in *Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure*

- Restrictions for Database Initialization Parameters in *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*

Edit Initialization Parameters

You can edit the **Value** and **Comment** fields of an initialization parameter on the Initialization Parameters page.

1. Go to the **Initialization Parameters** page.

2. Click **Edit** on the top-right of the page.
   Editable fields are displayed in the **Value** and **Comment** columns.

3. Add or edit the value and comment, and click **Save**.

4. Click **OK** in the **Save** dialog box.

If the initialization parameter you've edited is a dynamic parameter, then the changes take effect immediately and a restart of the Autonomous Database is not required. However, if you edit a static parameter, then a restart of the Autonomous Database is required for the edits to take effect. Note that to restart your Autonomous Database,

you'll have to go to the Oracle Cloud Infrastructure Console and stop and start your Autonomous Database. See To stop or start an Autonomous Database in Oracle Cloud Infrastructure documentation.

7
Load Data to Autonomous Databases

Using Oracle Database Management, you can enable the movement of data from an on-premises Oracle Database to an Autonomous Database.

Oracle Database Management uses Oracle Data Pump export and import utilities and reduces the overall time and complexity involved in migrating data from your on-premises Oracle Database to an Autonomous Database. For information on Oracle Data Pump, see Oracle Data Pump Export and Import in *Oracle Database Concepts*.

The Data Movement feature provides:

- End-to-end automation for data movement.
- Out-of-the-box analysis report for the migrated objects.
- Deep diagnostics to identify failure in migration process and the reasons for failure.

At a high-level, the data movement operation has the following major components:

- On-premises Oracle Database, which is the source database.

> **✎ Note:**
>
> The source on-premises Oracle Database must be of version 12.2.0.1.0 or later and on a Linux host.

- Autonomous Database, which is the destination database.
- Object Storage in the Oracle Cloud Infrastructure Console, which is required as an intermediary stage, because data is first loaded from the source database to the Cloud Storage platform (Object Storage), and from there it's loaded to the destination database. For information on Object Storage, see Overview of Object Storage in Oracle Cloud Infrastructure documentation.

Before you begin data movement, you must ensure that the source and destination database are available in Oracle Management Cloud. For information on how to discover the destination Autonomous Database in Oracle Management Cloud, see Discover Autonomous Databases.

Topics:

- Perform Data Movement Prerequisite Tasks
- Submit Data Movement Details
- Analyze Data Movement Results

Perform Data Movement Prerequisite Tasks

You must review and perform prerequisite tasks before you submit data movement details on the **Data Movement** page in Oracle Database Management.

First, ensure that you have the OMC Administrator role, or an OMC User role with the Manage privilege. For information on user roles and assigning the Manage privilege, see:

- About Oracle Database Management User Roles
- Access Policies to Assign Autonomous Database Related Privileges

Also, from the source on-premises Oracle Database, if you want to export database schema that does not belong to you, then you must ensure that the required role is granted. See Perform Source Database Related Prerequisites.

Topics:

- Install and Set Up a Cloud Agent
- Perform Source Database Related Prerequisites
- Perform Destination Database Related Prerequisites
- Perform Cloud Storage Related Prerequisites

Install and Set Up a Cloud Agent

You must perform the following tasks to set up a Cloud agent to orchestrate the data movement operation.

1. Install a Cloud agent on a host in your data center. For information, see Install Cloud Agents in *Installing and Managing Oracle Management Cloud Agents*.

   After you install the Cloud agent, the agent host is automatically added as an entity in Oracle Management Cloud.

2. Enable **Oracle Management Cloud – Enterprise Edition** on the agent host entity. For information, see Enable License Editions in *Getting Started with Oracle Management Cloud*.

3. Add a credential store. For information, see Add a Credential Store in *Installing and Managing Oracle Management Cloud Agents*.

4. Go to the Cloud agent installation directory and set the following properties:

   ```
   <AGENT_BASE_DIR>/agent_inst/bin/omcli setproperty agent -name
   OrchestrationExecutionOutputLimit -value 4096
   <AGENT_BASE_DIR>/agent_inst/bin/omcli setproperty agent -allow_new -
   name OrchestrationExecutionTimeLimit -value 23h
   <AGENT_BASE_DIR>/agent_inst/bin/omcli setproperty agent -allow_new -
   name _OrchestrationExecutionOutputLimit.units -value MC
   <AGENT_BASE_DIR>/agent_inst/bin/omcli  setproperty agent -allow_new -
   name _senderManagerFrequencyReceiverHeartBeatDelay -value 1
   ```

5. Create and save a JSON file with the credential information. For example, you can save it with the file name: `cred.json`.

6. Add host credentials on the Cloud agent using the `<AGENT_BASE_DIR>/agent_inst/bin/omcli add_credentials agent -credential_file <path-to-the-credentials-json-file>` command:

   ```
   [
     {
   ```

```
      "entity":"omc_host_linux.<HOST_NAME>",
      "name":"<HOST_NAME>-HostSSHPwdCreds",
      "type":"HostSSHPwdCreds",
      "globalName":"<agent_credential_name>",
      "description":"SSH Credential for the host entity",
      "properties":[
        { "name":"USERNAME", "value":"CLEAR[<YourUsername>]"},
        { "name":"PASSWORD", "value":"CLEAR[<YourPassword>]"}
      ]
    }
]
```

Important: Make a note of the `agent_credential_name` as you'll need it when submitting the source database details on the **Data Movement** page.

7. Restart the Cloud agent using the following omcli commands:

```
<AGENT_BASE_DIR>/agent_inst/bin/omcli stop agent
<AGENT_BASE_DIR>/agent_inst/bin/omcli start agent
```

cURL Requirement

`curl-7.19.7-46.el6.x86_64` or later version is required on the host where the Cloud agent is running to export dump files to Object Storage.

Perform Source Database Related Prerequisites

You must review and perform the following tasks, if required, to export data from the on-premises Oracle Database.

- Ensure that you have the `DATAPUMP_EXP_FULL_DATABASE` role, if you want to export database schemas that do not belong to you.
  Note that this role will only enable you to perform the export operation from the source on-premises Oracle Database. For more information on the Oracle Data Pump export utility role, see Required Roles for Data Pump Export and Import Operations in *Oracle Database Utilities*.

- Ensure that the directory object in which the exported dump files will be stored is available and has enough space. For databases, the default `DATA_PUMP_DIR` directory object exists and you can use it or create a new directory object. However, for Pluggable Databases (PDBs), you'll have to create a directory object. You must also ensure that you have `READ` and `WRITE` access to the directory object.
  To create a directory object and provide access:

```
$ mkdir -p <directory_location>
CREATE OR REPLACE DIRECTORY <name_of_the_directory_object_in_the_db> AS
<directory_location>;
GRANT WRITE ON DIRECTORY <name_of_the_directory_object_in_the_db> to
<user_name>;
GRANT READ ON DIRECTORY <name_of_the_directory_object_in_the_db> to
<user_name>;
```

Important: Make a note of the `<name_of_the_directory_object_in_the_db>` as you'll need it when submitting the source database details on the **Data Movement** page.

Note that in an Oracle Real Application Clusters (RAC) environment, the directory object location should be a shared location, which is shared across all the nodes.

Install Oracle Instant Client

You must download and install the Oracle Instant Client to connect to the destination Autonomous Database. The Oracle Instant Client must be installed on the same host on which you installed the Cloud agent that orchestrates the data movement operation.

To download the Oracle Instant Client:

1. Go to the Oracle Instant Client page and click **Download**.

2. On the **Oracle Instant Client Downloads** page, click **Instant Client for Linux x86-64**.

3. On the **Instant Client Downloads for Linux x86-64 (64-bit)** page, select the **Accept the License Agreement** option and download and install the following:

   - **Basic Package** – Includes the files required to connect to the destination Autonomous Database.

   - **Tools Package** – Includes Data Pump, SQL*Loader and Workload Replay Client.

   - **SQL*Plus Package** – Includes the SQL*Plus command line tool for SQL and PL/SQL queries.

Important: Make a note of the **Instant Client Location** as you'll need it when submitting the source database details on the **Data Movement** page.

Perform Destination Database Related Prerequisites

You must download the client credentials wallet from the Oracle Cloud Infrastructure Console.

1. Navigate to the details page of your Autonomous Database in the Oracle Cloud Infrastructure Console.

2. Click **DB Connection**.

3. In the **DB Connection** dialog, click **Download** under **Download Client Credentials (Wallet)**.

4. In the **Download Wallet** dialog, enter a wallet password, confirm the password, and click **Download**.
   The password must be at least 8 characters long and must include at least 1 letter and either 1 numeric character or 1 special character.

Important: Make a note of the location the wallet is downloaded to, as you'll have to upload the wallet zip file when submitting the destination database details on the **Data Movement** page.

Perform Cloud Storage Related Prerequisites

You must perform the following tasks to set up the Cloud Storage for data movement.

The Oracle Cloud Infrastructure Object Storage service is a Cloud Storage platform, which acts as an intermediary into which the dump files from the source on-premises Oracle Database are first exported, and then imported into the destination Autonomous Database. For information on Object Storage, see Overview of Object Storage in Oracle Cloud Infrastructure documentation.

- Access Object Storage in the Oracle Cloud Infrastructure Console and create a bucket, which is a logical container for storing the export dump files. When creating the bucket, ensure that you select the **STANDARD** option under **STORAGE TIER**. Also, ensure that the visibility of this bucket remains **PRIVATE**, which is the default option. For information on how to create a bucket, see To create a bucket in Oracle Cloud Infrastructure documentation.
  Important: Make a note of the **BUCKET NAME** as you'll need it when submitting the Cloud Storage details on the **Data Movement** page.

- Enable the destination Autonomous Database to connect to the Object Storage by generating an Auth Token, creating a name credential, and setting it as the default. The Auth Token is used by the Autonomous Database to authenticate itself and fetch the dump files from the Object Storage.
  To generate an Auth Token and set a name credential as default:

  1. In the Oracle Cloud Infrastructure Console, click the **User Profile** icon on the top-right corner and then click **User Settings**.

  2. On the left side of the page, click **Auth Tokens** and then click **Generate Token**.

  3. Enter a description for the Auth Token and click **Generate Token**.

  4. Copy the Auth Token immediately to a secure location from where you can retrieve it later, because the generated Auth Token will not be displayed again in the Oracle Cloud Infrastructure Console.

  5. Close the **Generate Token** dialog box.

  6. Connect to the Autonomous Database manually using Oracle Instant Client:

     ```
     $ORACLE_HOME/sqlplus 'admin/
     <password_set_when_creating_Autonomous_Database>@<predefined_service
     _name_in_tns.ora>'
     ```

     For more information on connecting to the Autonomous Database, see:
     - Connect with SQL*Plus in *Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure*
     - Connect with SQL*Plus in *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*

  7. Execute the following PL/SQL statements to create a credential and set it as the default:

     ```
     SET DEFINE OFF
     BEGIN DBMS_CLOUD.CREATE_CREDENTIAL('<credential_name>',
     ```

```
'<oci_username>', <auth_token>); END;
/
alter database property set default_credential =
'ADMIN.<credential_name>';
```

Submit Data Movement Details

After you perform the prerequisite tasks, you can load data from an on-premises Oracle Database to an Autonomous Databases on the **Data Movement** page in Oracle Database Management.

To go to the Data Movement page, go to the Database Home page of the destination Autonomous Database and click **Data Movement** in the **Oracle Database** navigation menu. The Data Movement page is divided into four sections: **Source**, **Destination**, **Cloud Storage**, and **Validation**.

Source

1. In the **Source** section, click **Add Source**.
   The **Select Source Database** dialog box is displayed and lists all the on-premises databases and PDBs of version 12.2.0.1.0 or later on a Linux host.

2. Select the database or PDB and click **Select**. Note that you cannot select a Container Database (CDB).
   Information on the selected source database and the **Source Inputs** fields are displayed in the **Source** section.

3. Update the **Source Inputs** fields.
   - **Cloud Agent**: Select the Cloud agent you installed to orchestrate the data movement operation and connect to the source database. See Install and Set Up a Cloud Agent.
   - **Cloud Agent Credential**: Enter the **agent_credential_name** you assigned to the host credential, when you set up a Cloud agent. See Install and Set Up a Cloud Agent.
   - **Instant Client Location**: Enter the location where you installed the Instant Client. See Install Oracle Instant Client.
   - **Dump Directory**: Enter the name of the directory object in which the dump files will be stored. See Perform Source Database Related Prerequisites.
   - **Encryption Password** and **Confirm Password**: Enter and confirm a password to ensure that the dump files being exported from the directory object are encrypted.
   - **Database Credentials**: Select **New Credentials** and enter a credential name for the source database in the **Credential Name** field. In the **User Name** and **Password** fields, enter the user name and password defined when creating the source database.
   - **Database Host Credentials**: These fields are enabled only when the Cloud agent and source database reside on different hosts. In such a case, the backup is copied from the source database host to the Cloud agent host using SSH. If these fields are enabled, enter the credential name used to connect to the host where the source database resides, in the **Credential Name** field. This credential requires the SSH user name and password.

4. Click **Advanced** to view and select the following Oracle Data Pump export dump file set (`expdp`) utility options. For more information on `expdp` utility options, see Data Pump Export in *Oracle Database Utilities*.

- **EXCLUDE**: The schema objects that are not applicable to the destination Autonomous Database and will be excluded are listed in this field. You can opt to remove one of the listed schema objects from the **EXCLUDE** field or add a schema object that must be excluded.

- **ENCRYPTION**: The default value selected in this field is **ALL**, which enables the encryption of all the data and metadata in the export operation. You can opt to select one of the other values available in the drop-down list:

  - **DATA_ONLY**: Specify that only data is written to the dump files in encrypted format.

  - **ENCRYPTED_COLUMNS_ONLY**: Specify that only encrypted columns are written to the dump files in encrypted format.

  - **METADATA_ONLY**: Specify that only metadata is written to the dump files in encrypted format.

- **ENCRYPTION_ALGORITHM**: The default value selected in this field is **AES128**, however, you can select **AES192** or **AES256** from the drop-down list.

- **REMAP_DATA**: Specify a remap function that takes as a source the original value of the designated column and returns a remapped value that will replace the original value in the dump files.

- **Add Option**: Click the drop-down list in the **Add Option** field to add and use advanced export options such as **COMPRESSION**, **CONTENT**, and **PARALLEL**.

After you're done updating the advanced export options, click **OK**.

5. Click **Next** to go to the **Destination** section.

Destination

1. In the **Destination** section, select from the predefined service names for Autonomous Databases in the **Service** drop-down list:

- **High**: The High database service provides the highest level of resources to each SQL statement resulting in the highest performance, but supports the fewest number of concurrent SQL statements.

- **Medium**: The Medium database service provides a lower level of resources to each SQL statement potentially resulting a lower level of performance, but supports more concurrent SQL statements.

- **Low**: The Low database service provides the least level of resources to each SQL statement, but supports the most number of concurrent SQL statements.

It's recommended that you select **High** in the **Service** drop-down list for data movement. For more information on predefined service names, see:

- Predefined Database Service Names for Autonomous Data Warehouse in *Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure*

- Predefined Database Service Names for Autonomous Transaction Processing in *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*

2. Select the **New Credentials** option under **Database Credentials** and enter a credential name for the destination database in the **Credential Name** field. In the **User Name** field, enter **ADMIN** and in the **Password** field, enter the password you had set under **Administrator Credentials** when creating your Autonomous Database in the Oracle Cloud Infrastructure Console.

3. Upload the **Data Credentials (Wallet)**. See Perform Destination Database Related Prerequisites.

4. Click **Advanced** to view and select the following Oracle Data Pump import dump file set (`impdp`) utility options. For more information on `impdp` utility options, see Data Pump Import in *Oracle Database Utilities*.

   • **TABLE_EXISTS_ACTION**: The default value selected in this field is **SKIP**, which leaves the table as is and moves on to the next object if the table you're trying to create already exists. You can opt to select one of the following values from the drop-down list:

      – **APPEND**: Load rows from the source and leave existing rows unchanged.

      – **REPLACE**: Drop the existing table and then create and load it from the source.

      – **TRUNCATE**: Delete existing rows and then load rows from the source.

   • **PARALLEL**: Specify the maximum number of processes of active execution operating on behalf of the import job. The default and the maximum value is the total number of CPUs and you can change it to a lower value.

   • **Add Option**: Click the drop-down list in the **Add Option** field to add and use advanced import options such as **REMAP_DATAFILE**, **REMAP_DIRECTORY**, and **REMAP_SCHEMA**.

5. Click **Next** to go to the **Cloud Storage** section.

Cloud Storage

1. In the **Cloud Storage** section, enter the Object Storage URL in the **Storage URL** field. The format of the storage URL is `objectstorage.<yourregion>.oraclecloud.com`, for example, `objectstorage.us-ashburn-1.oraclecloud.com`.

2. Enter the Object Storage namespace assigned to your Oracle Cloud Infrastructure tenancy in the **Namespace** field. See Understanding Object Storage Namespaces in Oracle Cloud Infrastructure documentation.

3. Enter the name of the bucket you created to store dump files in the **Bucket Name** field. See Perform Cloud Storage Related Prerequisites.

4. Enter the credential name created when discovering the Autonomous Database in Oracle Database Management in the **Credential** field. See Discover Autonomous Databases.

5. Click **Proxy Settings** and enter the Proxy Host and Port if a proxy is needed to communicate from the source database host to the Object Storage.

6. Click **Next** to go to the **Validation** section.

Validation

In the **Validation** section, click **Validate** to:

• Validate the details you've provided.

- Verify connections to the source database, destination database, and Object Store.
- Ensure that the user has all the necessary permissions.
- Estimate the dump file size and ensure that the directory and the Object Store bucket have enough space.

After the validation is complete, the analysis results are displayed and a green check mark denotes a successful check and a red cross denotes an unsuccessful check.

> **Note:**
>
> Clicking **Validate** is an optional task and you can submit data movement details without validating them. The details will be validated automatically on the **Activities** page.

As the final step, click **Submit**, specify an **Activity Name** to track the data movement operation in the **Confirm** dialog box, and click **Yes**. The Data Movement message is displayed briefly and then the **Activities** page is displayed.

Analyze Data Movement Results

After you submit the data movement details for a destination Autonomous Database, you can monitor the progress of the data movement operation, analyze the results, and diagnose issues on the **Activities** page.

The Activities page is displayed as soon as you submit the data movement details on the **Data Movement** page. If you want to go to the Activities page at a later time, then go to the Database Home page of the destination Autonomous Database and click **Activities** in the **Oracle Database** navigation menu.

The Activities page has the following columns:

- **Action**: Displays the **Activity Name** assigned to the data movement operation when submitting it. The default activity name is prefixed with "Data_Movement" and has the date and time when the operation was submitted. The data movement operation has the following three steps and you can monitor the progress of these steps by clicking the drop-down list to the left of the activity name:
  - **Validate**: Runs a number of checks such as validating the inputs you submitted on the **Data Movement** page, verifying connections to the source database, destination database, and Object Store, and estimating dump file size and ensuring that the directories and Object Store buckets have enough space.
  - **Export**: Exports dump files from the source database to Object Storage.
  - **Import**: Imports dump files from Object Storage to the destination database.
- **Status**: Displays the status of a step in the data movement operation. There are five status types:
  - ![icon] indicates that a step in the Data Movement operation, for example, Validate Data Pump, is submitted.
  - ![icon] indicates that a step is in progress.

- – ✔ indicates that a step has completed successfully.

- – ✖ indicates that a step has failed.

- – ⚠ indicates that a step has completed with errors.

- **Start**: Displays the time when the data movement operation started.

- **End**: Displays the time when the data movement operation ended.

- **Elapsed Time**: Displays the time taken for the data movement operation to complete.

The drop-down list (☰) to the right of the **Elapsed Time** column has the following options:

- **View Details**: Click to go to the **Orchestration Workflows** dashboard to view workflow execution details.

- **Log Analytics**: Click to go to the **Log Explorer** page in Oracle Log Analytics and review the logs available for the data movement operation.

- **Analyze**: Click to go to the **Load Data Analysis** page to diagnose the issues in the data movement operation, if any.

Diagnose Issues in the Data Movement Operation

On the **Activities** page, you can diagnose the issues in the data movement operation by clicking the status of a step in the **Status** column. The **Load Data Analysis** page is displayed and it has the following three tiles, which correspond to the steps in the Data Movement operation:

- **Validation**: Displays the number of checks that were executed and provides information on the source database, destination database, and Object Storage. If you click **Validation** below the Validation tile, then the validation checks are listed on the page, which help narrow down the issues in this step, if any.

- **Export**: Displays the number of database objects that were exported from the source database and provides information on the job, such as the Job Name, User, Type, and Status. If you click **Export** below the Export tile, then detailed information on the **Object Errors**, **Datapump Options**, and the **Datapump Files** (dump files) that were created during the export is displayed. You can use the information on this tile to diagnose issues in the Export step, if any.

- **Import**: Displays the number of database objects that were imported to the destination database and provides information on the job, such as the Job Name, User, Type, and Status. If you click **Import** below the Import tile, then detailed information on the **Object Errors**, **Datapump Options**, and the **Datapump Files** (dump files) that were created during the import is displayed. You can use the information on this tile to diagnose issues in the Import step, if any.

On the Load Data Analysis page, if the number of errors is displayed against **Error Count** on the **Export** or **Import** tile, then you can click it to go to the **Log Explorer** page in Oracle Log Analytics and review the logs of the data movement operation and troubleshoot the issue.