

Oracle® Enterprise Manager Cloud Control

Administrator's Guide for Oracle Autonomous Databases



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The Oracle logo, consisting of a solid red square with the word "ORACLE" in white, uppercase, sans-serif font centered within it.

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Contents

	Preface	
	<hr/>	
	Audience	iv
	Documentation Accessibility	iv
	Related Resources	iv
	Conventions	v
1	Use Oracle Enterprise Manager for Autonomous Databases	
	<hr/>	
	About Autonomous Databases	1-2
	About User Accounts	1-3
2	Discover Autonomous Databases	
	<hr/>	
	Perform Prerequisite Tasks	2-1
	Prerequisite Tasks for Autonomous Databases – Dedicated	2-1
	Oracle Enterprise Manager Deployed on Oracle Cloud Infrastructure	2-2
	Oracle Enterprise Manager Deployed On Premises	2-5
	Prerequisite Tasks for Autonomous Databases – Shared	2-7
	Oracle Enterprise Manager Deployed on Oracle Cloud Infrastructure	2-7
	Oracle Enterprise Manager Deployed On Premises	2-12
	Discover Autonomous Databases Using the Oracle Enterprise Manager Console	2-16
	Discover Autonomous Databases Using EM CLI	2-18
	Discover Autonomous Databases Using REST API	2-19
3	Monitoring and Administration Tasks	
	<hr/>	

Preface

This guide describes how you can use Oracle Enterprise Manager to discover, manage, and monitor Autonomous Databases.

Topics:

- [Audience](#)
- [Documentation Accessibility](#)
- [Related Resources](#)
- [Conventions](#)

Audience

This guide is intended for Database Administrators (DBAs) who want to use Oracle Enterprise Manager to discover Autonomous Databases. It also provides high-level information on the Oracle Enterprise Manager features 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>.

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Related Resources

Here are links to related resources:

- For information on how to use Oracle Enterprise Manager for Oracle Databases, database concepts and features, see [Oracle Database Documentation](#).
- For information on Oracle Cloud Infrastructure and Autonomous Databases, see:
 - [Oracle Cloud Infrastructure Documentation](#)
 - [Autonomous Data Warehouse Documentation](#)
 - [Autonomous Transaction Processing Documentation](#)

- For information on Oracle Enterprise Manager, see [Oracle Enterprise Manager Documentation](#).

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.
<i>italic</i>	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

Use Oracle Enterprise Manager for Autonomous Databases

You can use Oracle Enterprise Manager to discover, manage, and monitor your Autonomous Databases.

Oracle Enterprise Manager supports the following Autonomous Databases and the term "Autonomous Databases" in this guide collectively refers to them:

- Autonomous Data Warehouse – Dedicated
- Autonomous Transaction Processing – Dedicated
- Autonomous Data Warehouse – Shared
- Autonomous Transaction Processing – Shared

Oracle Enterprise Manager is deployed either on Oracle Cloud Infrastructure or on-premises, and using it you can:

- Discover Autonomous Databases.
- Monitor the health and performance of Autonomous Databases and perform deep diagnostics on the Performance Hub.
- Perform database administration tasks such as storage management, and schema management tasks such as creating database objects.

Note that separate licensing is not required to use Oracle Enterprise Manager for Autonomous Databases. All the supported Oracle Enterprise Manager features for Oracle Databases are bundled with the Autonomous Database.

For information on:

- Oracle Enterprise Manager features for Autonomous Databases, see [Monitoring and Administration Tasks](#).
- Oracle Database features in Autonomous Data Warehouse – Dedicated, see Using Oracle Database Features in Autonomous Data Warehouse Dedicated Deployments in *Using Oracle Autonomous Data Warehouse on Dedicated Exadata Infrastructure*.
- Oracle Database features in Autonomous Transaction Processing – Dedicated, see Using Oracle Database Features in Autonomous Transaction Processing Dedicated Deployments in *Using Oracle Autonomous Transaction Processing on Dedicated Exadata Infrastructure*.
- Oracle Database features in Autonomous Data Warehouse – Shared, see Autonomous Data Warehouse for Experienced Oracle Database Users in *Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure*.
- Oracle Database features in Autonomous Transaction Processing – Shared, see Autonomous Transaction Processing for Experienced Oracle Database Users in *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*.

Topics:

- [About Autonomous Databases](#)
- [About User Accounts](#)

About Autonomous Databases

Autonomous Databases are fully managed, preconfigured database environments that are created in Oracle Cloud Infrastructure.

Autonomous Databases are cloud databases that deliver end-to-end automation of tasks that are traditionally performed by DBAs, such as provisioning the database and monitoring security, availability, and performance. Using Autonomous Databases, you do not have to configure or manage any hardware, or install any software. After creating an Autonomous Database, you can scale the number of CPU cores or the storage capacity of the database at any time without impacting availability or performance.

Autonomous Databases are of the following types:

- **Autonomous Data Warehouse**, which provides an easy-to-use, fully autonomous data warehouse that scales elastically, delivers fast query performance and requires no database administration. It is designed to support all standard SQL and business intelligence (BI) tools, and provides all of the performance of the Oracle Database in an environment that is tuned and optimized for data warehouse workloads. For more information, see [Autonomous Data Warehouse](#).
- **Autonomous Transaction Processing**, which is designed to support all standard business applications and delivers scalable query performance. Autonomous Transaction Processing provides all of the performance of the Oracle Database in an environment that is tuned and optimized for transaction processing workloads. For more information, see [Autonomous Transaction Processing](#).

When you create an Autonomous Database, you can deploy it to one of two kinds of Oracle Exadata infrastructure:

- **Dedicated Deployment**, which is a private cloud in public cloud choice. A completely dedicated compute, storage, network and database service for only a single tenant. Dedicated infrastructure provides for the highest levels of security isolation and governance.
- **Shared Deployment**, which is a simple and elastic choice. Oracle autonomously operates all aspects of the database life cycle from database placement to backup and updates.

Most tasks related to Autonomous Databases are automated, however, you have to monitor, diagnose, and perform basic application-level administrative tasks. Here's where you can use Oracle Enterprise Manager and ensure:

- Alert-driven monitoring for visibility into availability and key metrics.
- In-depth application performance diagnostics and troubleshooting.
- Insight-driven utilization analysis built on aggregated monitoring, based on historical data.

About User Accounts

You must have certain Administrator accounts to use Oracle Enterprise Manager for Autonomous Databases.

The following table lists the Oracle Enterprise Manager Administrator accounts and the Autonomous Database-related tasks users assigned these can perform. For information on how to create administrators in Oracle Enterprise Manager, see [Creating Roles and Administrators](#) in *Oracle Enterprise Manager Cloud Control Getting Started Guide*.

Administrator Account	Tasks
Super Administrator (<i>sysman</i>)	This is the Oracle Enterprise Manager Super Administrator and is created by default when Oracle Enterprise Manager is deployed. Specific to Autonomous Databases, the Super Administrator can: <ul style="list-style-type: none"> • Create Oracle Enterprise Database Administrator user accounts. • Grant privileges to manage Autonomous Databases.
Database Administrator	The Database Administrator is created and assigned by the Super Administrator, and has full access to the database and can perform any operation on the database. Specific to Autonomous Databases, the Database Administrator can: <ul style="list-style-type: none"> • Discover or delete Autonomous Databases. • Monitor Autonomous Databases. See Creating a Database Administrator Account in <i>Oracle Enterprise Manager Cloud Control Security Guide</i> .

Other than the two Oracle Enterprise Manager administrator accounts, you must also have the user accounts listed in the following table, which are created when the Autonomous Database is created.

User Account	Tasks
Database Admin User (<i>Admin</i>)	This is the super user for the Autonomous Database and is required for real-time database management. Note: The <i>Admin</i> user can also perform monitoring tasks, however, it is recommended that the Monitoring User (<i>adbsnmp</i>) account is used for monitoring.
Monitoring User (<i>adbsnmp</i>)	This user is created out-of-the-box when the Autonomous Database is created in Oracle Cloud Infrastructure. This account is locked by default and you can reset the password and unlock it using Oracle Enterprise Manager or any SQL client. The <i>adbsnmp</i> user can: <ul style="list-style-type: none"> • Discover the Autonomous Database in Oracle Enterprise Manager. • Collect Autonomous Database metrics. • View the data on the Performance Overview page.

2

Discover Autonomous Databases

Autonomous Databases are created in Oracle Cloud Infrastructure and then discovered in Oracle Enterprise Manager for monitoring.

You can discover Autonomous Databases using Oracle Enterprise Manager deployed on Oracle Cloud Infrastructure or on premises. This chapter provides the prerequisite tasks, and the procedures to discover Autonomous Databases in Oracle Enterprise Manager using:

- Oracle Enterprise Manager Console
- EM CLI
- REST API

Topics:

- [Perform Prerequisite Tasks](#)
- [Discover Autonomous Databases Using the Oracle Enterprise Manager Console](#)
- [Discover Autonomous Databases Using EM CLI](#)
- [Discover Autonomous Databases Using REST API](#)

Perform Prerequisite Tasks

You must perform certain prerequisite tasks to set up Oracle Enterprise Manager to work with Oracle Cloud Infrastructure and discover Autonomous Databases.

You can discover Autonomous Databases from Oracle Enterprise Manager deployed on Oracle Cloud Infrastructure or on premises. The prerequisite tasks that must be performed for each deployment scenario differ for Autonomous Databases – Dedicated and Autonomous Databases – Shared, and depending on which Autonomous Database you want to discover, you must follow the instructions given in one of the following sections.

Topics:

- [Prerequisite Tasks for Autonomous Databases – Dedicated](#)
- [Prerequisite Tasks for Autonomous Databases – Shared](#)

Prerequisite Tasks for Autonomous Databases – Dedicated

To discover Autonomous Data Warehouse – Dedicated and Autonomous Transaction Processing – Dedicated in Oracle Enterprise Manager deployed on Oracle Cloud Infrastructure or on premises, you must first perform the prerequisite tasks listed in these sections:

- [Oracle Enterprise Manager Deployed on Oracle Cloud Infrastructure](#)
- [Oracle Enterprise Manager Deployed On Premises](#)

Oracle Enterprise Manager Deployed on Oracle Cloud Infrastructure

You can use Oracle Enterprise Manager deployed on Oracle Cloud Infrastructure and discover Autonomous Databases – Dedicated.

Before you discover Autonomous Databases – Dedicated, you must ensure that you have performed the following tasks:

- **Create an Autonomous Database – Dedicated in Oracle Cloud Infrastructure.** After you create the database, you must download the OCI Client Credential (Wallet) and save the `.zip` file to provide client access to the Autonomous Database – Dedicated.

For information, see:

- Create an Autonomous Data Warehouse Dedicated Database and Download Client Credentials in *Using Oracle Autonomous Data Warehouse on Dedicated Exadata Infrastructure*.
- Create an Autonomous Transaction Processing Dedicated Database and Download Client Credentials in *Using Oracle Autonomous Transaction Processing on Dedicated Exadata Infrastructure*.

- **Configure and deploy Oracle Enterprise Manager on Oracle Cloud Infrastructure.** Oracle Enterprise Manager should be deployed in a Public or Private subnet in the same VCN as the Autonomous Database – Dedicated. The Enterprise Manager Oracle Management Service (OMS) includes a central Oracle Management Agent to discover Autonomous Databases, which are treated as non-host targets. The central agent is installed by default on the OMS host and must have SQL*Net access to the Autonomous Database – Dedicated. Although, it is recommended that you use the central agent, you also have the option of using any other agent that is deployed on an existing Oracle Cloud Infrastructure Database system.

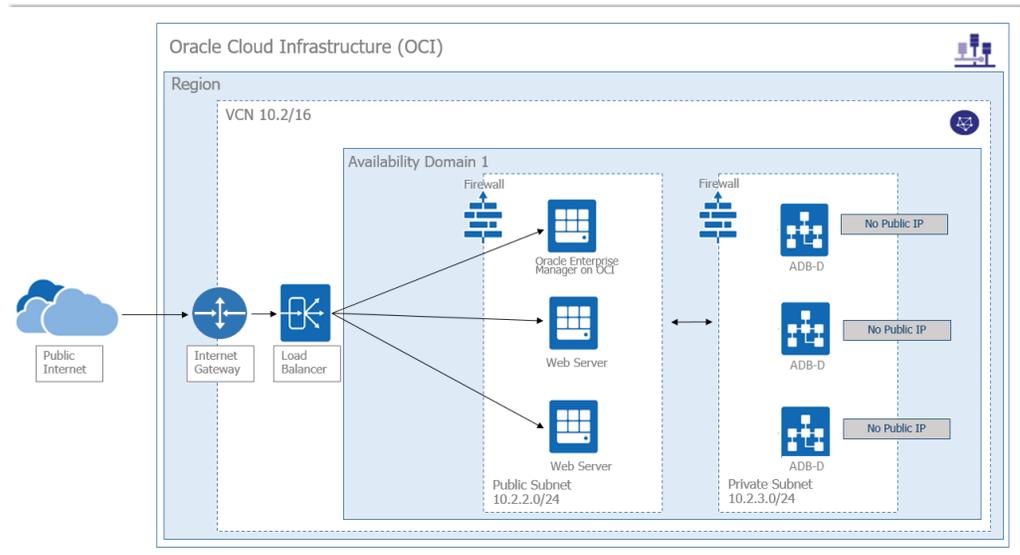
For information, see the [Setting Up Oracle Enterprise Manager 13.4 on Oracle Cloud Infrastructure](#) tutorial.

- **Review and use the specified connectivity option to connect Oracle Enterprise Manager on Oracle Cloud Infrastructure with the Autonomous Database – Dedicated.** The network path to an Autonomous Database – Dedicated is through a Virtual Cloud Network (VCN) and subnet defined by the dedicated infrastructure hosting the database. Usually, the subnet is defined as Private, meaning that there is no Public Internet access to the database. Private IP addresses are used to connect Oracle Enterprise Manager with the Autonomous Database – Dedicated in the VCN.

For information, see:

- About Connecting to an Autonomous Data Warehouse Dedicated Database in *Using Oracle Autonomous Data Warehouse on Dedicated Exadata Infrastructure*.
- About Connecting to an Autonomous Transaction Processing Dedicated Database in *Using Oracle Autonomous Transaction Processing on Dedicated Exadata Infrastructure*.
- [Private IP Addresses](#) in Oracle Cloud Infrastructure documentation.

The following diagram provides an overview of how Oracle Enterprise Manager deployed on Oracle Cloud Infrastructure connects with Autonomous Databases – Dedicated.



In the diagram:

- Oracle Enterprise Manager is deployed using a Marketplace image in a Public subnet in a VCN.
Note that in the diagram, the other Web Servers in the Public subnet are not a part of the Oracle Enterprise Manager deployment, but a part of a sample scenario that depicts a typical Oracle Cloud Infrastructure application deployment that connects with Autonomous Databases – Dedicated.
- Autonomous Databases – Dedicated are created in a Private subnet in the same VCN.
- Oracle Enterprise Manager connects with Autonomous Databases – Dedicated using a Private IP address.

Other Prerequisite Tasks

After the major components are in place, you must perform the following prerequisite tasks to discover an Autonomous Database – Dedicated.

1. Create an Oracle Cloud Infrastructure Identity and Access Management (IAM) group named **EMGroup**, and add the DBA who will be managing and monitoring the Autonomous Database – Dedicated using Oracle Enterprise Manager to this group. Note that this DBA user must have an account in Oracle Cloud Infrastructure.
See [To create a group](#) in Oracle Cloud Infrastructure documentation.
2. Create the following policies to allow the DBA in **EMGroup** to manage and monitor the Autonomous Database – Dedicated using Oracle Enterprise Manager.
Allow group EMGroup to manage autonomous-database in compartment <compartment in which the Autonomous Database resides>

Allow group EMGroup to manage orm-stacks in compartment <compartment in which the Oracle Enterprise Manager stack resides>

Allow group EMGroup to manage instance-family in compartment <compartment in which the Oracle Enterprise Manager stack resides>

Allow group EMGroup to manage volume-family in compartment
<compartment in which the Oracle Enterprise Manager stack resides>

Allow group EMGroup to manage load-balancers in compartment
<compartment in which the Oracle Enterprise Manager stack resides>

Allow group EMGroup to manage virtual-network-family in compartment
<compartment in which the Oracle Enterprise Manager stack resides>

Allow group EMGroup to manage file-family in compartment <compartment
in which the Oracle Enterprise Manager stack resides>

Allow group EMGroup to manage autonomous-database-family in
compartment <compartment in which the Oracle Enterprise Manager stack
resides>

Allow group EMGroup to manage orm-jobs in compartment <compartment in
which the Oracle Enterprise Manager stack resides>

Allow group EMGroup to read resource-availability in compartment
<compartment in which the Autonomous Database resides> and
<compartment in which the Oracle Enterprise Manager stack resides>

Allow group EMGroup to read limits in compartment <compartment in
which the Autonomous Database resides> and <compartment in which the
Oracle Enterprise Manager stack resides>

 **Note:**

For the last two policies listed above, to grant read access to `resource-availability` and `limits`, you must use separate statements for each compartment.

See [To create a policy](#) in Oracle Cloud Infrastructure documentation.

3. Create a security list and add the following ingress rules to ensure secure access:
 - Rule for accessing Oracle Enterprise Manager from the public network, allow Transmission Control Protocol (TCP) traffic for port 7803.
 - Rule for accessing Autonomous Database – Dedicated from Oracle Enterprise Manager subnet and VCN, allow TCP/TCPs traffic for the port value specified in the `tnsnames.ora` file in the OCI Client Credential (Wallet).

For information, see:

- [Security Lists](#) in Oracle Cloud Infrastructure documentation.
 - About Connecting to an Autonomous Data Warehouse Dedicated Database in *Using Oracle Autonomous Data Warehouse on Dedicated Exadata Infrastructure*.
 - About Connecting to an Autonomous Transaction Processing Dedicated Database in *Using Oracle Autonomous Transaction Processing on Dedicated Exadata Infrastructure*.
4. Unlock the `adbsnmp` user, which is created out-of-the-box when the Autonomous Database – Dedicated is created in Oracle Cloud Infrastructure. This account is locked by default and you can reset the password and unlock it using Oracle Enterprise Manager or a SQL client.

Oracle Enterprise Manager Deployed On Premises

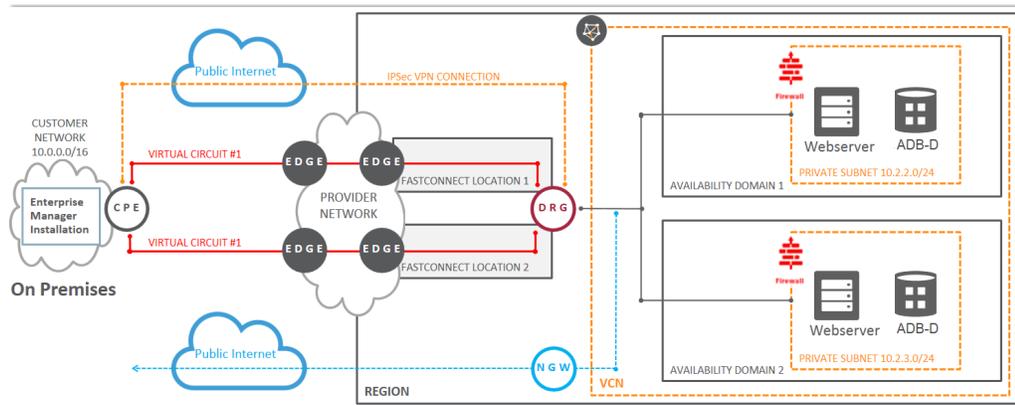
You can use Oracle Enterprise Manager deployed on premises to discover Autonomous Databases – Dedicated, including Autonomous Databases – Dedicated on Oracle Exadata Cloud at Customer.

Before you discover Autonomous Databases – Dedicated, you must ensure that you have performed the following tasks:

- **Create an Autonomous Database – Dedicated in Oracle Cloud Infrastructure.** After you create the database, you must download the OCI Client Credential (Wallet) and save the .zip file to provide client access to the Autonomous Database – Dedicated. For information, see:
 - Create an Autonomous Data Warehouse Dedicated Database and Download Client Credentials in *Using Oracle Autonomous Data Warehouse on Dedicated Exadata Infrastructure*.
 - Create an Autonomous Transaction Processing Dedicated Database and Download Client Credentials in *Using Oracle Autonomous Transaction Processing on Dedicated Exadata Infrastructure*.
- **Deploy Oracle Enterprise Manager in your on-premises network.** The OMS includes a central Oracle Management Agent that can be used to discover Autonomous Databases, which are treated as non-host targets. The central agent is installed by default on the OMS host and must have SQL*Net access to the Autonomous Database – Dedicated. Note that if you have an existing on-premises database or an Oracle Cloud Infrastructure Database system in the same VCN where the Autonomous Database – Dedicated resides, you have the option of using the agent that monitors them, instead of the central agent. For information, see:
 - Installing the Enterprise Manager Cloud Control 13c Release 4 Software Binaries in Graphical Mode Along with Plug-ins in *Oracle Enterprise Manager Cloud Control Upgrade Guide*.
 - Overview of the Directories Created for an Enterprise Manager System in *Oracle Enterprise Manager Cloud Control Basic Installation Guide*.
- **Review and use the specified connectivity options to connect Oracle Enterprise Manager deployed on premises with the Autonomous Database – Dedicated.** Oracle Enterprise Manager on premises connects with the Autonomous Database – Dedicated using a Private IP address, and you can use one of the following options to connect Oracle Enterprise Manager deployed in your on-premises network to the Autonomous Database – Dedicated in your VCN.
 - VPN Connect, which is an Internet Protocol Security (IPSec) VPN. IPSec VPN provides standards-based IPSec encryption over public internet. See [VPN Connect](#) in Oracle Cloud Infrastructure documentation.
 - FastConnect, which provides an easy way to create a dedicated, private connection between the on-premises network and the VCN in Oracle Cloud Infrastructure. See [FastConnect](#) in Oracle Cloud Infrastructure documentation.

Note that you do not have host access to the Autonomous Database – Dedicated in Oracle Cloud Infrastructure. If required, web server instances in the Private subnet can initiate connections to the internet by way of a NAT gateway. See [NAT Gateway](#) in Oracle Cloud Infrastructure documentation.

The following diagram provides an overview of how Oracle Enterprise Manager deployed on premises connects and interacts with Autonomous Databases – Dedicated in Oracle Cloud Infrastructure.



In the diagram:

- Oracle Enterprise Manager is deployed in an on-premises network.
- The Autonomous Databases – Dedicated are created in Private subnets in a VCN in Oracle Cloud Infrastructure.
- The two connectivity options, VPN Connect and FastConnect, are displayed to demonstrate how Oracle Enterprise Manager deployed on premises connects with the Autonomous Database – Dedicated using these options.

Other Prerequisite Tasks

After the major components are in place, you must perform the following prerequisite tasks to discover an Autonomous Database – Dedicated.

1. Create an Oracle Cloud Infrastructure IAM group named **EMGroup**, and add the DBA who will be managing and monitoring the Autonomous Database – Dedicated using Oracle Enterprise Manager to this group. Note that this DBA user must have an account in Oracle Cloud Infrastructure.
See [To create a group](#) in Oracle Cloud Infrastructure documentation.
2. Create the following policy to allow the DBA in **EMGroup** to manage and monitor the Autonomous Database – Dedicated using Oracle Enterprise Manager:
Allow group EMGroup to manage autonomous-database in compartment <compartment in which the Autonomous Database resides>
See [To create a policy](#) in Oracle Cloud Infrastructure documentation.
3. Create a security list and add the following ingress rule to ensure secure access:
Rule for accessing Autonomous Database – Dedicated in the Oracle Cloud Infrastructure VCN from Oracle Enterprise Manager deployed on premises, allow TCP/TCPs traffic for the port value specified in the `tnsnames.ora` file in the OCI Client Credential (Wallet).

For information, see:

- [Security Lists](#) in Oracle Cloud Infrastructure documentation.

- About Connecting to an Autonomous Data Warehouse Dedicated Database in *Using Oracle Autonomous Data Warehouse on Dedicated Exadata Infrastructure*.
 - About Connecting to an Autonomous Transaction Processing Dedicated Database in *Using Oracle Autonomous Transaction Processing on Dedicated Exadata Infrastructure*.
4. Unlock the `adbsnmp` user, which is created out-of-the-box when the Autonomous Database – Dedicated is created in Oracle Cloud Infrastructure. This account is locked by default and you can reset the password and unlock it using Oracle Enterprise Manager or a SQL client.

Prerequisite Tasks for Autonomous Databases – Shared

To discover Autonomous Data Warehouse – Shared and Autonomous Transaction Processing – Shared in Oracle Enterprise Manager deployed on Oracle Cloud Infrastructure or on premises, you must first perform the prerequisite tasks listed in these sections:

- [Oracle Enterprise Manager Deployed on Oracle Cloud Infrastructure](#)
- [Oracle Enterprise Manager Deployed On Premises](#)

Oracle Enterprise Manager Deployed on Oracle Cloud Infrastructure

You can use Oracle Enterprise Manager deployed on Oracle Cloud Infrastructure and discover Autonomous Databases – Shared.

Oracle Enterprise Manager deployed on Oracle Cloud Infrastructure can access Autonomous Databases – Shared with Private Endpoints or with Public Endpoints using a Service Gateway. The following sections provide information on both scenarios, however, it is recommended that you configure Private Endpoints to access Autonomous Databases – Shared.

Access Autonomous Database – Shared Using a Private Endpoint

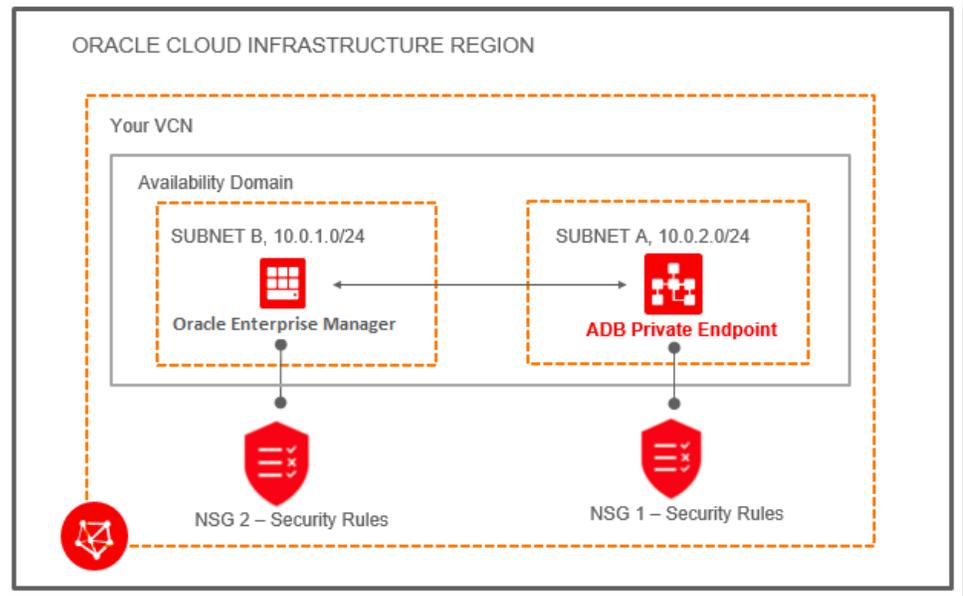
This section walks you through a scenario in which you enable private access from your Oracle Enterprise Manager deployed on Oracle Cloud Infrastructure to the Autonomous Database – Shared in Oracle Services Network using a *private endpoint*. For information on Autonomous Databases – Shared and private endpoints, see [Autonomous Database with Private Endpoint](#) in Oracle Cloud Infrastructure documentation.

- **Provision an Autonomous Database – Shared with a Private Endpoint.** A private endpoint is a private IP address within your VCN that you can use to access the Autonomous Database – Shared within Oracle Cloud Infrastructure. When you enable a private endpoint for an Autonomous Database – Shared, the only access path to the database is through a VCN inside your Oracle Cloud Infrastructure tenancy. This is required for you to securely connect to the Autonomous Database – Shared from Oracle Enterprise Manager. You can configure a private endpoint when you provision or clone an Autonomous Database – Shared.
For information, see:
 - [Configure Private Endpoints When You Provision or Clone an Instance in Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure](#).

- Configure Private Endpoints When You Provision or Clone an Instance in *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*.
- **Download the Client Credentials (Wallet).** After you provision the database, you must download the OCI Client Credential (Wallet) and save the .zip file to provide client access to the Autonomous Database – Shared.
For information, see:
 - Download Client Credentials (Wallets) in *Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure*.
 - Download Client Credentials (Wallets) in *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*.
- **Configure and deploy Oracle Enterprise Manager on Oracle Cloud Infrastructure.** Oracle Enterprise Manager should be deployed using a marketplace image in a Public or Private subnet in the same VCN as the Autonomous Database – Shared that was configured with private endpoints. The OMS includes a central Oracle Management Agent to discover Autonomous Databases, which are treated as non-host targets. The central agent is installed by default on the OMS host and must have SQL*Net access to the Autonomous Database – Shared. Although, it is recommended that you use the central agent, you also have the option of using any other agent that is deployed on an existing Oracle Cloud Infrastructure Database system.

For information, see the [Setting Up Oracle Enterprise Manager 13.4 on Oracle Cloud Infrastructure](#) tutorial.
- **Review and use the specified connectivity option to connect Oracle Enterprise Manager on Oracle Cloud Infrastructure with the Autonomous Database – Shared.** With a private endpoint, database traffic remains private and within Oracle Cloud Infrastructure, thereby ensuring network security. For information on connecting from Oracle Enterprise Manager deployed on Oracle Cloud Infrastructure to an Autonomous Database – Shared, see **Example 1: Connecting from Within Oracle Cloud Infrastructure** in [Connecting to an Autonomous Database with a Private Endpoint](#) in Oracle Cloud Infrastructure documentation.

The following diagram provides an overview of how Oracle Enterprise Manager deployed on Oracle Cloud Infrastructure connects with Autonomous Databases – Shared using a private endpoint.



Access Autonomous Database – Shared Using the Service Gateway

This section walks you through a scenario in which you enable access from your Oracle Enterprise Manager deployed on Oracle Cloud Infrastructure to the Autonomous Database – Shared in the Oracle Services Network by using the *service gateway*. This method should only be used when the Autonomous Database – Shared is not configured with a private endpoint. For information on Oracle Services Network and the Service Gateway, see [Access to Oracle Services: Service Gateway](#) in Oracle Cloud Infrastructure documentation.

- **Provision an Autonomous Database – Shared.** As a first step, you must ensure that you have provisioned the Autonomous Database – Shared. For information, see:
 - Provision Autonomous Data Warehouse in *Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure*.
 - Provision Autonomous Transaction Processing in *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*.
- **Download the Client Credentials (Wallet).** After you provision the database, you must download the OCI Client Credential (Wallet) and save the .zip file to provide client access to the Autonomous Database – Shared. For information, see:
 - Download Client Credentials (Wallets) in *Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure*.
 - Download Client Credentials (Wallets) in *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*.
- **Configure and deploy Oracle Enterprise Manager on Oracle Cloud Infrastructure.** Oracle Enterprise Manager should be deployed in a Public or Private subnet in the same VCN as the Autonomous Database – Shared. The OMS includes a central Oracle Management Agent to discover Autonomous Databases, which are treated as non-host targets. The central agent is installed by default on the OMS host and must have SQL*Net access to the Autonomous

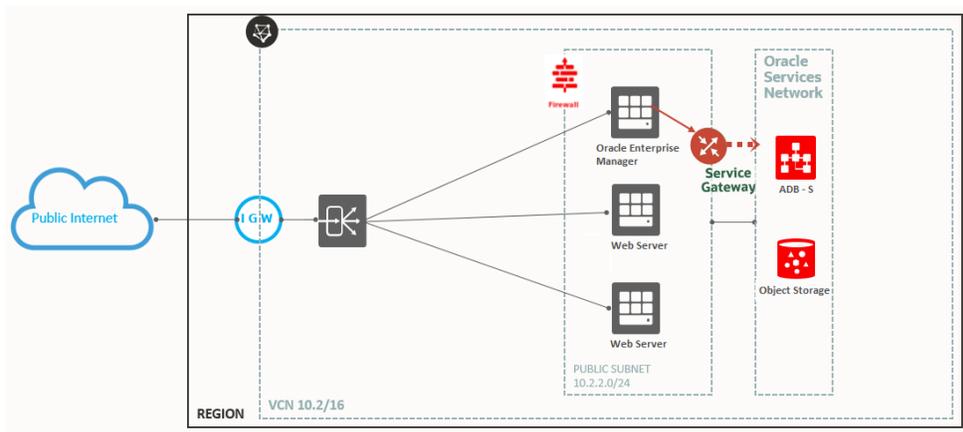
Database – Shared. Although, it is recommended that you use the central agent, you also have the option of using any other agent that is deployed on an existing Oracle Cloud Infrastructure Database system.

For information, see the [Setting Up Oracle Enterprise Manager 13.4 on Oracle Cloud Infrastructure](#) tutorial.

- Create a Service Gateway.** You must create a service gateway as a resource in the VCN. This will enable the Oracle Enterprise Manager Deployed on Oracle Cloud Infrastructure in your VCN to privately access Autonomous Database – Shared in the Oracle Services Network, without exposing the data to the public internet.

For information, see **Task 1 Create the service gateway** in [Setting Up a Service Gateway in the Console](#) in Oracle Cloud Infrastructure documentation.
- Review and use the specified connectivity option to connect Oracle Enterprise Manager on Oracle Cloud Infrastructure with the Autonomous Database – Shared.** The next step is to ensure that the subnet in which Oracle Enterprise Manager resides in your VCN has access to the service gateway. To do so, you must add a route rule in the private subnet's route table. To do so, follow the instructions given in **Task 2: Update routing for the subnet** in [Setting Up a Service Gateway in the Console](#) in Oracle Cloud Infrastructure documentation, and choose **Service Gateway** as the **Target Type** and the service CIDR label **All <region> Services in Oracle Services Network** as the **Destination Service**. The service gateway now provides access to the Autonomous Databases – Shared within the region in Oracle Services Network.

The following diagram provides an overview of how Oracle Enterprise Manager deployed on Oracle Cloud Infrastructure connects with Autonomous Databases – Shared using a service gateway.



Other Prerequisite Tasks

After you have ensured that the major components are in place using one of the two options given above, you must perform the following prerequisite tasks to discover an Autonomous Database – Shared for Oracle Enterprise Manager deployed on Oracle Cloud Infrastructure.

1. Create an Oracle Cloud Infrastructure IAM group named **EMGroup**, and add the DBA who will be managing and monitoring the Autonomous Database – Shared using Oracle Enterprise Manager to this group. Note that this DBA user must have an account in Oracle Cloud Infrastructure.

See [To create a group](#) in Oracle Cloud Infrastructure documentation.

2. Create the following policies to allow the DBA in **EMGroup** to manage and monitor the Autonomous Database – Dedicated using Oracle Enterprise Manager.

Allow group EMGroup to manage autonomous-database in compartment
<compartment in which the Autonomous Database resides>

Allow group EMGroup to manage orm-stacks in compartment <compartment
in which the Oracle Enterprise Manager stack resides>

Allow group EMGroup to manage instance-family in compartment
<compartment in which the Oracle Enterprise Manager stack resides>

Allow group EMGroup to manage volume-family in compartment
<compartment in which the Oracle Enterprise Manager stack resides>

Allow group EMGroup to manage load-balancers in compartment
<compartment in which the Oracle Enterprise Manager stack resides>

Allow group EMGroup to manage virtual-network-family in compartment
<compartment in which the Oracle Enterprise Manager stack resides>

Allow group EMGroup to manage file-family in compartment <compartment
in which the Oracle Enterprise Manager stack resides>

Allow group EMGroup to manage autonomous-database-family in
compartment <compartment in which the Oracle Enterprise Manager stack
resides>

Allow group EMGroup to manage orm-jobs in compartment <compartment in
which the Oracle Enterprise Manager stack resides>

Allow group EMGroup to read resource-availability in compartment
<compartment in which the Autonomous Database resides> and
<compartment in which the Oracle Enterprise Manager stack resides>

Allow group EMGroup to read limits in compartment <compartment in
which the Autonomous Database resides> and <compartment in which the
Oracle Enterprise Manager stack resides>

 **Note:**

For the last two policies listed above, to grant read access to `resource-availability` and `limits`, you must use separate statements for each compartment.

See [To create a policy](#) in Oracle Cloud Infrastructure documentation.

3. Create a security list and add the following ingress rules to ensure secure access:

- Rule for accessing Oracle Enterprise Manager from the public network, allow Transmission Control Protocol (TCP) traffic for port 7803.
- Rule for accessing Autonomous Database – Shared from Oracle Enterprise Manager subnet and VCN, allow TCPS traffic for the port value specified in the `tnsnames.ora` file in the OCI Client Credential (Wallet).

For information, see:

- [Security Lists](#) in Oracle Cloud Infrastructure documentation.

- About Connecting to an Autonomous Data Warehouse Instance in *Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure*.
 - About Connecting to an Autonomous Transaction Processing Instance in *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*.
4. Unlock the `adbsnmp` user, which is created out-of-the-box when the Autonomous Database – Shared is created in Oracle Cloud Infrastructure. This account is locked by default and you can reset the password and unlock it using Oracle Enterprise Manager or a SQL client.

Oracle Enterprise Manager Deployed On Premises

You can use Oracle Enterprise Manager deployed on premises to discover Autonomous Databases – Shared.

Oracle Enterprise Manager deployed on premises can access Autonomous Databases – Shared with Private Endpoints or using Transit Routing using a Service Gateway. The following sections provide information on both scenarios, however, it is recommended that you configure Private Endpoints to access Autonomous Databases – Shared.

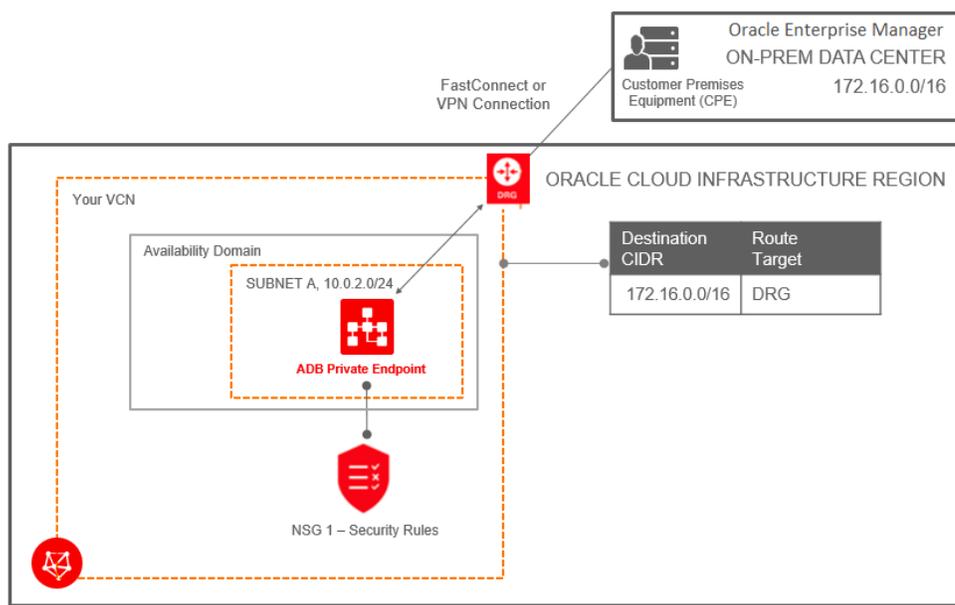
Access Autonomous Database – Shared Using a Private Endpoint

This section walks you through a scenario in which you enable private access from your Oracle Enterprise Manager deployed on premises to the Autonomous Database – Shared in Oracle Services Network using a *private endpoint*. For information on Autonomous Databases – Shared and private endpoints, see [Autonomous Database with Private Endpoint](#) in Oracle Cloud Infrastructure documentation.

- **Provision an Autonomous Database – Shared with a Private Endpoint.** A private endpoint is a private IP address within your VCN that you can use to access Autonomous Database – Shared within Oracle Cloud Infrastructure. When you enable a private endpoint for an Autonomous Database – Shared, the only access path to the database is through a VCN inside your Oracle Cloud Infrastructure tenancy. This is required for you to securely connect to the Autonomous Database – Shared from Oracle Enterprise Manager. You can configure a private endpoint when you provision or clone an Autonomous Database – Shared. For information, see:
 - Configure Private Endpoints When You Provision or Clone an Instance in *Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure*.
 - Configure Private Endpoints When You Provision or Clone an Instance in *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*.
- **Download the Client Credentials (Wallet).** After you provision the database, you must download the OCI Client Credential (Wallet) and save the `.zip` file to provide client access to the Autonomous Database – Shared. For information, see:
 - Download Client Credentials (Wallets) in *Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure*.
 - Download Client Credentials (Wallets) in *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*.

- **Deploy Oracle Enterprise Manager in your on-premises network.** The OMS includes a central Oracle Management Agent that can be used to discover Autonomous Databases, which are treated as non-host targets. The central agent is installed by default on the OMS host and must have SQL*Net access to the Autonomous Database – Shared. Note that if you have an existing on-premises database or an Oracle Cloud Infrastructure Database system in the same VCN where the Autonomous Database – Shared resides, you have the option of using the agent that monitors them, instead of the central agent. For information, see:
 - Installing the Enterprise Manager Cloud Control 13c Release 4 Software Binaries in Graphical Mode Along with Plug-ins in *Oracle Enterprise Manager Cloud Control Upgrade Guide*.
 - Overview of the Directories Created for an Enterprise Manager System in *Oracle Enterprise Manager Cloud Control Basic Installation Guide*.
- **Review and use the specified connectivity option to connect Oracle Enterprise Manager on premises with the Autonomous Database – Shared.** Oracle Enterprise Manager is deployed in an on-premises data center and connects privately to the Autonomous Database – Shared, thereby ensuring that traffic does not go over public internet. For information on connecting from Oracle Enterprise Manager deployed on premises to an Autonomous Database – Shared, see **Example 2: Connecting from an On-Premises Data Center** in [Connecting to an Autonomous Database with a Private Endpoint](#) in Oracle Cloud Infrastructure documentation.

The following diagram provides an overview of how Oracle Enterprise Manager deployed on premises connects with Autonomous Databases – Shared using a private endpoint.

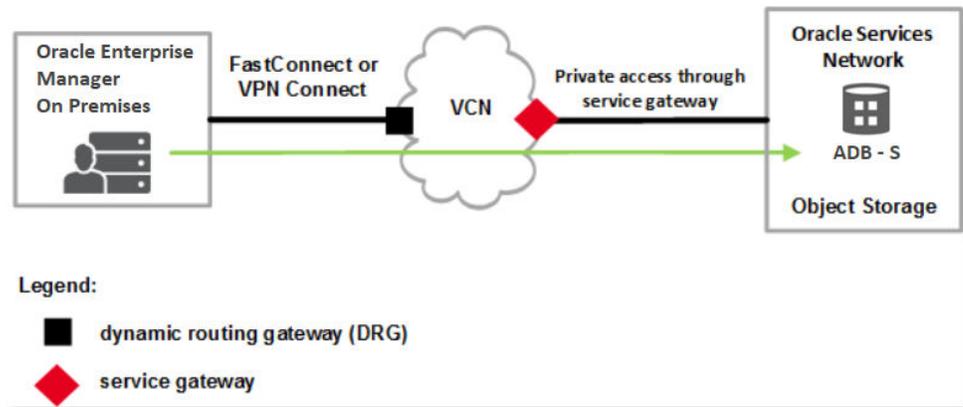


Access Autonomous Database – Shared Using Transit Routing

This section walks you through a scenario in which you enable private access from your Oracle Enterprise Manager deployed on premises to the Autonomous Database

- Shared in Oracle Services Network using *Transit Routing*. This method should only be used when the Autonomous Database – Shared is not configured with a private endpoint. For information on Transit Routing, see [Overview of On-Premises Network Private Access to Oracle Services](#) in Oracle Cloud Infrastructure documentation.
- **Provision an Autonomous Database – Shared.** As a first step, you must ensure that you have provisioned the Autonomous Database – Shared.
For information, see:
 - Provision Autonomous Data Warehouse in *Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure*.
 - Provision Autonomous Transaction Processing in *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*.
- **Download the Client Credentials (Wallet).** After you provision the database, you must download the OCI Client Credential (Wallet) and save the `.zip` file to provide client access to the Autonomous Database – Shared.
For information, see:
 - Download Client Credentials (Wallets) in *Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure*.
 - Download Client Credentials (Wallets) in *Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure*.
- **Deploy Oracle Enterprise Manager in your on-premises network.** The OMS includes a central Oracle Management Agent that can be used to discover Autonomous Databases, which are treated as non-host targets. The central agent is installed by default on the OMS host and must have SQL*Net access to the Autonomous Database – Shared. Note that if you have an existing on-premises database or an Oracle Cloud Infrastructure Database system in the same VCN where the Autonomous Database – Shared resides, you have the option of using the agent that monitors them, instead of the central agent.
For information, see:
 - Installing the Enterprise Manager Cloud Control 13c Release 4 Software Binaries in Graphical Mode Along with Plug-ins in *Oracle Enterprise Manager Cloud Control Upgrade Guide*.
 - Overview of the Directories Created for an Enterprise Manager System in *Oracle Enterprise Manager Cloud Control Basic Installation Guide*.
- **Review and use the specified connectivity option to connect Oracle Enterprise Manager on premises with the Autonomous Database – Shared.** Oracle Enterprise Manager is deployed in an on-premises data center and connects to a VCN using FastConnect private virtual circuit or VPN Connect. Each of these types of connections terminates in a dynamic routing gateway (DRG) that is attached to the VCN. The VCN also has a service gateway, which gives the VCN access to the Autonomous Database – Shared. The traffic from Oracle Enterprise Manager deployed on premises transits through the VCN, through the service gateway, and to the Autonomous Database – Shared. The responses return through the service gateway and VCN to Oracle Enterprise Manager deployed on premises.
For information on how to configure transit routing directly through gateways, see the tasks given in **For routing directly between gateways** in [Setting Up Private Access to Oracle Services](#) in Oracle Cloud Infrastructure documentation.

The following diagram provides an overview of how Oracle Enterprise Manager deployed on premises connects with Autonomous Databases – Shared using transit routing.



Other Prerequisite Tasks

After you have ensured that the major components are in place using one of the two options given above, you must perform the following prerequisite tasks to discover an Autonomous Database – Shared from Oracle Enterprise Manager deployed on premises.

1. Create an Oracle Cloud Infrastructure IAM group named **EMGroup**, and add the DBA who will be managing and monitoring the Autonomous Database – Shared using Oracle Enterprise Manager to this group. Note that this DBA user must have an account in Oracle Cloud Infrastructure. See [To create a group](#) in Oracle Cloud Infrastructure documentation.
2. Create the following policy to allow the DBA in **EMGroup** to manage and monitor the Autonomous Database – Shared using Oracle Enterprise Manager:
Allow group EMGroup to manage autonomous-database in <compartment in which the Autonomous Database - Shared resides>
See [To create a policy](#) in Oracle Cloud Infrastructure documentation.
3. Create a security list and add the following ingress rule to ensure secure access:
Rule for accessing Autonomous Database – Shared in the Oracle Cloud Infrastructure VCN from Oracle Enterprise Manager deployed on premises, allow TCPS traffic for the port value specified in the `tnsnames.ora` file in the OCI Client Credential (Wallet).

For information, see:

- [Security Lists](#) in Oracle Cloud Infrastructure documentation.
 - [About Connecting to an Autonomous Data Warehouse Instance in Using Oracle Autonomous Data Warehouse on Shared Exadata Infrastructure.](#)
 - [About Connecting to an Autonomous Transaction Processing Instance in Using Oracle Autonomous Transaction Processing on Shared Exadata Infrastructure.](#)
4. Unlock the `adbsnmp` user, which is created out-of-the-box when the Autonomous Database – Shared is created in Oracle Cloud Infrastructure. This account is

locked by default and you can reset the password and unlock it using Oracle Enterprise Manager or a SQL client.

Discover Autonomous Databases Using the Oracle Enterprise Manager Console

Autonomous Databases are treated as non-host targets in Oracle Enterprise Manager and are discovered manually using the declarative process.

Oracle Enterprise Manager supports a TCP connection and a secure TCP (TCPS) connection using the TLS protocol for Autonomous Databases – Dedicated, and only the TCPS connection using the TLS protocol for Autonomous Databases – Shared.

1. From the **Setup** menu, select **Add Target**, and then select **Add Targets Manually**.
2. On the **Add Targets Manually** page, click **Add Target Manually** on the **Add Non-Host Targets Manually** tile.
3. In the **Add Target Manually** dialog box, select the host on which the agent that you are using to discover the Autonomous Database is installed and running.
4. In the **Target Type** field, enter and select the Autonomous Database type and click **Add**.

Your options are **Autonomous Data Warehouse** and **Autonomous Transaction Processing** and Oracle Enterprise Manager discovers the selected target type on the host you selected in the previous step.

5. On the **Add <Autonomous Database Type>: Properties** page, specify the following monitoring details:
 - a. Enter a name to identify the Autonomous Database target in the **Target Name** field.
 - b. Select the **Is Dedicated** check box for Autonomous Data Warehouse – Dedicated and Autonomous Transaction Processing – Dedicated targets. If you are discovering Autonomous Data Warehouse – Shared and Autonomous Transaction Processing – Shared targets, then leave this check box unchecked.
 - c. Upload the **OCI Client Credential (Wallet)** .zip file, which contains the credentials to access data in your Autonomous Database.

After you upload the OCI client credential wallet .zip file, the **Service Name** and **Connection Descriptor** fields are automatically populated.

Note that you can change the **Service Name** value and opt for a secure TCP (TCPS) connection using the TLS protocol. It is recommended that you use the `low` or `low_tls` database service. For information on Database Service Names, see the Predefined Database Service Names section in the documentation for the Autonomous Database you are discovering.

- d. Enter the **Wallet Password**. This is the password you set in the Oracle Cloud Infrastructure Console when downloading the OCI client credential wallet .zip file.
- e. Enter the monitoring password. It is recommended that you use the `adbsnmp` user account and if you are a first time user, then you must enter a new password to reset it and unlock the `adbsnmp` user account. See [About User Accounts](#).

Add Autonomous Data Warehouse: Properties Test Connection Back Step 1 of 2 Next Cancel

General
Add a Autonomous Data Warehouse to be monitored by Enterprise Manager by specifying target monitoring properties.

Target Name: ADWS1
Target Type: Autonomous Data Warehouse
Is Dedicated:

OCI Client Credential (Wallet): TENANT1_wallet.zip Update...
Wallet Password:
Service Name: adwp_low

Name	Value
Monitoring Username	adwmp
Monitoring Password
Connection Descriptor	(description=(entry_count=20)retry_delay=3)address=(protocol=tcp)(port=1521)(host=...)(connect_data=(service_name=...))security=(ssl_server_cert_dn="CN=...")

- Click **Test Connection** to test the connection made to the Autonomous Database.

Note:

If the network is slow, the following connection message may be displayed:

Connection failure may be due to a slow network, or due to the presence of an intervening firewall.

You can opt to click **OK** and the discovery process will continue asynchronously.

- Click **Next** and review the displayed information.
- Click **Submit**.

After you have discovered the Autonomous Database in Oracle Enterprise Manager, you can verify if the discovery was successful by clicking the **Targets** menu > **Databases** option. The Autonomous Database you discovered should be listed on the **Databases** page.

You can also check connectivity between the OMS host and agent and the Autonomous Database target using JDBC. To do so, you must obtain the following information from the OCI Client Credential (Wallet) .zip file:

- Host
- Port

Run the following command from the OMS host and agent:

```
nc -zv <host> <port>
```

For example:

```
nc -zv host-awwwh-scan.exadatasubnet.exadatainfrastr...com 1521
```

Discover Autonomous Databases Using EM CLI

You can use the Oracle Enterprise Manager Command Line Interface (EM CLI) verb `add_cloud_db_target`, to discover an Autonomous Database in Oracle Enterprise Manager.

Format

```
emcli add_cloud_db_target
    -name="target_name"
    -type="target_type"
    -host="agent_host"
    -zip_file_location="cred_file_zip_location"
    -
credentials="UserName:<db_username>;password:<db_password>;Role:<db_user
_role>"
    -wallet_password="wallet_password"
    -service_name="tns_service_name"
    [-is_dedicated="is_dedicated"]
    [-standby_agent_host="standby_agent_host"]
```

Options

- `-name`: Name of the Autonomous Database target.
- `-type`: Type of Autonomous Database. The target type value for **Autonomous Data Warehouse** databases is `oracle_cloud_adw` and the value for **Autonomous Transaction Processing** databases is `oracle_cloud_atp`.
- `-host`: Host on which the agent that you are using to discover the Autonomous Database is installed and running.
- `-zip_file_location`: Location of the Oracle Cloud Infrastructure Client Credentials (Wallet) .zip file. The .zip file location should be accessible from the OMS host.
- `-credentials`: Monitoring user credentials. It is recommended that you use the `adbsnmp` user account. See [About User Accounts](#).
- `-wallet_password`: The wallet password set in the Oracle Cloud Infrastructure Console when downloading the OCI Client Credential Wallet.
- `-service_name`: Predefined database service name of the Autonomous Database. The `low` database service is the default value and to perform monitoring and management tasks, it is recommended that you use the `low` database service. Note that Oracle Enterprise Manager supports both TCP and TCPS using the TLS protocol for Autonomous Databases – Dedicated, and only TCPS using the TLS protocol for Autonomous Databases – Shared. The default protocol for Autonomous Databases – Dedicated is TCP.

For information on Database Service Names, see the Predefined Database Service Names section in the documentation for the Autonomous Database you are discovering.

- `-is_dedicated`: True for an Autonomous Database – Dedicated and False for an Autonomous Database – Shared. If a value is not specified for this parameter, then it defaults to an Autonomous Database – Shared.
- `-standby_agent_host`: Host on which a backup agent is installed. If the primary agent goes down or crashes, then the backup agent monitors the target. This is an optional parameter.

Example

```
emcli add_cloud_db_target
    -name="ATPD1"
    -type="oracle_cloud_atp"
    -host="myhostname.example.com"
    -zip_file_location="/u01/oracle/atpd/wallet_ATPD1.zip"
    -
credentials="UserName:adbsnmp;password:password;Role:Normal"
    -wallet_password="password"
    -service_name="ATPD1_low"
    [-is_dedicated="True"]
    [-standby_agent_host="standbyhostname.example.com"]
```

Discover Autonomous Databases Using REST API

You can discover an Autonomous Database in Oracle Enterprise Manager using REST API.

Feature	Description
URL	<code>https://<em_url>:<em_port>/em/websvcs/restful/emws/oracle.sysman.db/v0/discovery/add_cloud_db_target</code>
Request Header	Content-Type: application/json
Body	<pre>{ "target_name": "target_name", "target_type": "target_type", "agent_host": "agent_host", "zip_file_location": "cred_file_zip_location", "credentials": "UserName:<db_username>;password:<db_password>;Role:<db_user_role>", "wallet_password": "wallet_password", "service_name": "tns_service_name", "is_dedicated": "is_dedicated" "-standby_agent_host="standby_agent_host" }</pre> <p>For descriptions, see Discover Autonomous Databases Using EM CLI.</p>
Request Method	POST
Sample Response	Successfully added target :<target name>

Feature	Description
Supported Since Release	EM DB Plug-in Bundle Patch 13.3.2.0.190731

3

Monitoring and Administration Tasks

After you have discovered Autonomous Databases, you can perform the following monitoring and administration tasks using Oracle Enterprise Manager for Autonomous Databases.

As you review the information available in the following table, note that:

- For Autonomous Databases, Oracle Enterprise Manager provides a subset of the features that it provides for Oracle Databases. The "more information" links in the following table currently take you to generic information on Oracle Enterprise Manager support for Oracle Databases, and all the features may not be available for Autonomous Databases.
- When you click the options in the user interface that take you to other Performance, Security, Schema, and Administration pages, the **Database Login** page is displayed and you must enter the Database Admin User credentials. These credentials can also be configured as named credentials. For information on named credentials, see *Credentials Management in Oracle Enterprise Manager Cloud Control Security Guide*.

Task	Description
<p>Monitor the state and workload of the Autonomous Database on the Database Home page</p>	<p>To go to the Database Home page:</p> <ol style="list-style-type: none"> 1. Click the Targets menu > Databases option. 2. On the Databases page, click the name of the Autonomous Database. <p>The Database Home page enables you to proactively monitor:</p> <ul style="list-style-type: none"> • Load and Capacity of the Autonomous Database. • Database Incidents that have occurred over the last 24 hours, if any. • Active session information in the Performance section, which includes: <ul style="list-style-type: none"> – The Activity Class chart that shows the average number of database sessions active for the past hour. – The Services chart that shows the average number of database sessions active for the past hour for database services. • Resource utilization on CPU, Active Sessions, Memory, and Data Storage charts in the Resources section. • SQL activity in the SQL Monitor section. The table in this section provides information on monitored SQL statement executions. <p>For information on:</p> <ul style="list-style-type: none"> • The Database Home page, see Monitoring General Database State and Workload in <i>Oracle Database 2 Day DBA</i>. • The options available in the <Autonomous Database Type> menu, see Monitoring and Managing Targets in <i>Oracle Enterprise Manager Cloud Control Administrator's Guide</i>. • Autonomous Database metrics, see Autonomous Databases in <i>Oracle Database Plug-in Metric Reference Manual</i>.

Task	Description
<p>Monitor performance and diagnose issues on the Performance Hub, SQL Monitoring, AWR, and Advisors pages</p>	<p>Using Oracle Enterprise Manager, you can monitor the performance of an Autonomous Database and ensure that it performs optimally.</p> <p>From the Performance menu on the Database Home page, you can select one of the following options:</p> <ul style="list-style-type: none"> • Performance Hub: View all the performance data available for a specified time period. Once a time period is selected, the performance information is collected and presented based on performance subject areas. • SQL: Perform SQL monitoring and tuning tasks. This includes options such as: <ul style="list-style-type: none"> – SQL Tuning Advisor to submit SQL statements and obtain recommendations on how to tune the statements, along with a rationale and expected benefit. – SQL Performance Analyzer to determine the effect of a change on a SQL workload by identifying performance divergence for each SQL statement. – SQL Tuning Sets to group SQL statements and related metadata into a single object, which you can use as input to SQL tuning tools. • AWR: Use Automatic Workload Repository (AWR) and automate database statistics gathering by collecting, processing, and maintaining performance statistics for database problem detection and self-tuning purposes. This includes options such as: <ul style="list-style-type: none"> – AWR Report to generate an AWR report between two snapshots (two points in time). – Compare Period Reports to compare database performance between two periods of time (or two AWR reports with a total of four snapshots). • Advisors Home: View and use SQL advisors to optimize the database's performance. • Automatic Indexing: Automate index management tasks for 19c-based Autonomous Databases. Automatic indexing automatically creates, rebuilds, and drops indexes in a database based on the changes in application workload, thereby improving database performance. This includes the following options: <ul style="list-style-type: none"> – Settings: On the Automatic Indexing Configuration Settings page, you can enable and disable automatic indexing, specify the retention period for unused indexes and automatic indexing logs, and specify the schemas to be included or excluded from using automatic indexing. – Activity Report: On the Automatic Indexing Activity Report page, you can enter the following details and click Generate Report to view the details of the auto indexes generated in the database: <ul style="list-style-type: none"> * Report Format: Select the format in which you want the report to be generated. * Sections: Select the sections that you want displayed in the report. The Summary, Index Details, Verification Details, and Errors options are selected by default in the Sections field, and you can opt to remove any of these sections.

Task	Description
	<ul style="list-style-type: none"> * Time Period: Select the monitoring time period for which you want the report to be generated. <p>If you select the default options, namely the HTML report format and all the options in the Sections field for a specific time period, then the following sections are displayed in the Report Summary:</p> <ul style="list-style-type: none"> * Overview of Executions: This section displays the overall performance improvement factor as a result of the auto indexes, the number of times the auto index operations were completed, the number of times the auto index operations were interrupted, and fatal errors, if any. Note that the Overview of Executions section is displayed irrespective of which other section is selected in the Sections field. * For the Summary section option, the following bar graphs are displayed: <ul style="list-style-type: none"> * Summary of Auto Indexes Actions * Summary of Auto Indexes SQL Actions * Summary of Manual Indexes * For the Errors section option, the Error Summary pie chart is displayed. * For the Index Details section option, the following sections are displayed: <ul style="list-style-type: none"> * Index: Created * Index: Dropped <p>You can click a row in the Index: Created and Index: Dropped sections to view more details such as the ID of the index that was created or dropped, the Key, and Type. You can also use the Download All Index Created Details and Download All Index Dropped Details options given in these sections to download the index details in a <code>.csv</code> format.</p> * For the Verification Details section option, the Verification Details section is displayed, which includes the details of the SQLs for which auto indexes were generated and used. You can click a row in this section to view more details such as SQL ID, SQL Text, and Improvement Factor. <p>If you select the TEXT report format in the Report Format field, then the same information is displayed in a plain text format and can be downloaded by clicking the Text Download option.</p> <ul style="list-style-type: none"> • Blocking Sessions: Use to view the sessions that are blocking other sessions. The Blocking Sessions table provides information such as the Sessions Blocked, Session ID, and Serial Number. To view details about a specific session, click the Select option for that row and click View Session. To terminate a session, click the Select option, and then click Kill Session. <p>For information on:</p> <ul style="list-style-type: none"> • Monitoring performance on the Performance Hub, see <i>Monitoring Performance Using the Performance Hub in Oracle Database 2 Day DBA</i>.

Task	Description
	<ul style="list-style-type: none"><li data-bbox="756 275 1438 352">• Tuning SQL statements using the SQL Tuning Advisor, see Running the SQL Tuning Advisor in <i>Oracle Database 2 Day DBA</i>.<li data-bbox="756 365 1386 422">• Managing auto indexes, see Managing Auto Indexes in <i>Oracle Database Administrator's Guide</i>.<li data-bbox="756 426 1365 453">• <i>Oracle Database 2 Day + Performance Tuning Guide</i><li data-bbox="756 457 1190 485">• <i>Oracle Database SQL Tuning Guide</i><li data-bbox="756 489 1141 516">• <i>Oracle Database Testing Guide</i>

Task	Description
<p>Test migration from an on-premises database to an Autonomous Database using the SQL Performance Analyzer workflow</p>	<p>Using the SQL Performance Analyzer workflow in Oracle Enterprise Manager, you can test the effects of a migration from an on-premises database to an Autonomous Database based on SQL Tuning Set performance.</p> <p>As prerequisite steps, you must:</p> <ul style="list-style-type: none"> • Ensure that the source on-premises database and the target Autonomous Database are discovered in Oracle Enterprise Manager. • Capture the representative SQL workload from the source on-premises database and create a SQL Tuning Set. For information, see <i>Creating a SQL Tuning Set</i> in <i>Oracle Database 2 Day + Performance Tuning Guide</i>. • Move the SQL Tuning Set to the target Autonomous Database. For information, see <i>Transporting SQL Tuning Sets</i> in <i>Oracle Database 2 Day + Performance Tuning Guide</i>. <p>To test the migration from an on-premises database to an Autonomous Database:</p> <ol style="list-style-type: none"> 1. Go to the Autonomous Database home page and select the Performance menu > SQL > SQL Performance Analyzer Home. If the Database Login page appears, then log in as a user with administrator privileges. For information on user privileges, see About User Accounts. 2. Click Migrate to Oracle Autonomous Database. 3. Enter the required information in the fields on the Migrate to Oracle Autonomous Database page. <ul style="list-style-type: none"> • Task Information: Enter task information such as the name of the task, the name of the SQL Tuning Set, and optionally a description of the task. • Pre-Migration Trial: The pre-migration trial is built from the SQL Tuning Set by default, and Build from SQL Tuning Set is the only available pre-migration trial option. • Post-Migration Trial: Select an option in the Creation Method and Per-SQL Time Limit lists. For information on these lists and what you must enter, see steps 4 and 5 in <i>Testing Database Upgrades Using Cloud Control</i> in <i>Oracle Database Testing Guide</i>. • Trial Comparison: In the Comparison Metric list, select the comparison metric to use for the comparison analysis. • Schedule: Select your time zone code and select Immediately or Later to schedule when the task should start. 4. Click Submit. The SQL Performance Analyzer Home page is displayed. In the SQL Performance Analyzer Tasks section, the details of the task are displayed. The Last Run Status displays Processing while the SQL statements are being processed. To refresh the status of the task, click Refresh. After the task completes, the Last Run Status column is updated to Completed.

Task	Description
	<p>5. Under SQL Performance Analyzer Tasks, select the task and click the link in the Name column. The SQL Performance Analyzer Task page is displayed and it has the following sections:</p> <ul style="list-style-type: none"> • SQL Tuning Set: This section summarizes information about the SQL tuning set, including its name, owner, description, and the number of SQL statements it contains. • SQL Trials: This section includes a table that lists the SQL trials used in the SQL Performance Analyzer task. • SQL Trial Comparisons: This section contains a table that lists the results of the SQL trial comparisons <p>6. Click the icon in the Comparison Report column. The SQL Performance Analyzer Task Result page appears.</p> <p>7. Review the results of the performance analysis. For information, see <i>Reviewing the SQL Performance Analyzer Report Using Oracle Enterprise Manager</i> in <i>Oracle Database Testing Guide</i>.</p> <p>For information on:</p> <ul style="list-style-type: none"> • SQL Tuning Sets, see <i>Managing SQL Tuning Sets</i> in <i>Oracle Database 2 Day + Performance Tuning Guide</i>. • SQL Performance Analyzer, see <i>SQL Performance Analyzer</i> in <i>Oracle Database Testing Guide</i>.
Migrate workloads from an on-premises database to an Autonomous Database using the Database Migration Workbench	For information on the supported migration methods, prerequisite tasks, migration steps, and so on, see <i>Database Migration</i> in <i>Oracle Enterprise Manager Cloud Control Database Lifecycle Management Administrator's Guide</i> .

Task	Description
Keep the Autonomous Databases secure	<p>Oracle Enterprise Manager provides security features that control how a database is accessed and used.</p> <p>From the Security menu on the Database Home page, you can select one of the following options:</p> <ul style="list-style-type: none"> • Users: Create a user with a valid username and password to prevent unauthorized use. You can also associate specified privileges, roles, and so on with a user. • Roles: Create a role to group together privileges and other roles. This facilitates granting multiple privileges and roles to users. • Profiles: Create a profile, which is a set of user authorizations and privileges. If you add a user to a profile, then the authorizations and privileges defined in that profile are acquired by the user. • Audit Settings: Set up and adjust audit settings to monitor and record selected user database actions. • Privilege Analysis: Perform a dynamic analysis of privileges and roles that a user account or database uses over time. You can then revoke unused grants and make other changes to better reflect the access a user requires. • Virtual Private Database: Create security policies to enforce row-level security policies at the object (table, view, or synonym) level, when the standard object privileges and associated database roles are insufficient to meet application security requirements.
Perform Schema Management tasks	<p>Oracle Enterprise Manager provides a comprehensive set of tools that allows you to manage all aspects of database objects such as tables, indexes, and views.</p> <p>From the Schema menu on the Database Home page, you can select one of the following options to perform fundamental tasks such as creating, editing, and viewing schema objects:</p> <ul style="list-style-type: none"> • Database Objects: Create and manage all aspects of database directory objects such as tables and indexes. • Programs: Manage the procedures, functions, triggers and so on associated with the database.

Task	Description
Perform Database Administration tasks such as Storage Management and Automated Maintenance	<p>Oracle Enterprise Manager allows you to view and manage the storage structures of Autonomous Databases.</p> <p>From the Administration menu on the Database Home page for Autonomous Database – Dedicated targets, you can select one of the following options. Note that for Autonomous Database – Shared targets, the Storage option is not available.</p> <ul style="list-style-type: none"> • Storage: Manage your datafiles and tablespaces by clicking the corresponding option. Use Automatic Undo Management to view: <ul style="list-style-type: none"> – Name and size of undo tablespace – Auto-extend tablespace setting – Auto-tuned undo retention period – Minimum retention period <p>Note that for Autonomous Databases, you cannot configure the Undo setting. This is a read-only view to understand the Undo configuration.</p> • Oracle Scheduler: Use the Automated Maintenance Tasks option to enable the following maintenance tasks, which are performed automatically during maintenance windows: <ul style="list-style-type: none"> – Optimizer Statistics Gathering: Collects optimizer statistics for all schema objects in the database for which there are no statistics or only stale statistics. – Automatic SQL Tuning: Examines the performance of high-load SQL statements, and makes recommendations on how to tune those statements. <p>For information on:</p> <ul style="list-style-type: none"> • Performing storage tasks, see Performing Common Database Storage Tasks in <i>Oracle Database 2 Day DBA</i>. • Managing automated maintenance tasks, see Managing Automated Database Maintenance Tasks in <i>Oracle Database Administrator's Guide</i>.