

# Exadata Database Service

## Database Lifecycle Management

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# Objectives



**After completing this lesson, you should be able to:**

Create Custom Database & Grid Infrastructure Software Images

Create Database Home

Create Database

Perform PDB Management

Enable Data Guard

Perform User-Managed Maintenance Updates



# Exadata Database Service

Create Custom Software Image



# Create Custom Database & Grid Infrastructure Images

Overview > Oracle Exadata Database Service on Dedicated Infrastructure > Software images

Resources

Software images

List scope

MyDemo

Compartment

ocidbaasgmt (root)/b2dran/MyDemo

Filters

Image type

All

Service Type

ExaDB-D

Software images in MyDemo compartment

Grid Infrastructure software images are resources containing Oracle Grid Infrastructure software used to provision and patch Oracle Grid Infrastructure and Oracle Grid Infrastructure Homes. Grid Infrastructure software images are either Oracle-published software releases or custom software images created by your organization that include specified patches and updates. [Learn more](#)

Database software images are resources containing Oracle Database software used to provision and patch Oracle Databases and Oracle Database Homes. Database software images are either Oracle-published software releases or custom software images created by your organization that include specified patches and updates. [Learn more](#)

Create software image

Display name	Lifecycle state	Image type	Service	Version	Created
No items found.					

Showing 0 items < 1 of 1 >

Create software image

Software images can be created for Oracle Exadata Database Service on Dedicated Infrastructure. [Learn more](#)

Image type

Database software image ☒ Create custom gold software images for Databases

Grid Infrastructure software image ☐ Create custom gold software images for Grid Infrastructure.

Provide basic information for the database software image

Display name

MyCustom23aDBImage

Select a compartment

MyDemo

ocidbaasgmt (root)/b2dran/MyDemo

Configure the database software image

Database release

23ai

Choose a Database version (release update) ⓘ

23.4.0.24.05

Enter one-off patch numbers Optional

You can use a comma-separated list to enter multiple patch numbers.

Upload an Oracle Home inventory Optional ⓘ

Drop files here. Or browse.

Show advanced options

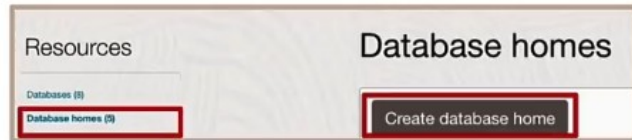
Create software image Cancel



# Exadata Database Service

## Create Database Home

# Create Database Home



## Create a Database Home

- Provide the **Database Home display name**
- Select the **Database Image Version** to use
  - ❖ Select from **Oracle Provided or Custom** Database Software Images
- Click on **Create button** to proceed

The screenshot shows the 'Create database home' form. At the top, there is a 'Help' link. The form contains the following elements:

- A text input field for 'Database Home display name' with the value 'MyDemo23aiDBHome01'.
- A checkbox for 'Unified Auditing' which is checked.
- A 'Database image' section with a dropdown menu showing 'Oracle Database 23ai'. This entire section is highlighted with a red rectangular box. To the right of the dropdown is a 'Change database image' button.
- A blue information icon followed by the text: 'A 23ai based database home can only be provisioned on a VM cluster running Grid Infrastructure 23ai and later.'
- A link for 'Show advanced options'.
- At the bottom left, there are 'Create' and 'Cancel' buttons. The 'Create' button is highlighted with a red rectangular box.





# Exadata Database Service

## Create Database

# Create Database



## Create a Database

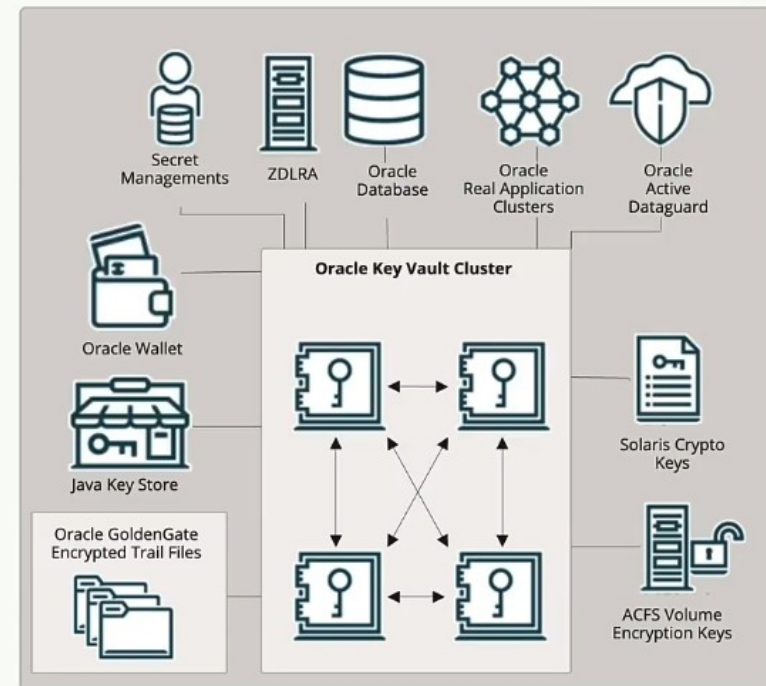
- Provide the **Database name**
- Specify **Database Home** to use
- Create **Admin Credentials**
- Configure **Database Backup** details
- Select **Encryption Key Management**
- Click on **Create Database** button

The image shows two screenshots of the 'Create database' wizard in the Oracle Cloud console. The left screenshot shows the 'Basic information for the database' section, where fields for 'Database name' (MyDemoDB), 'Unique name' (MyDemo19cCDB), 'Database version' (23ai), and 'PDB name' (MyPDB01) are filled. The 'Specify a database home' section shows 'Select an existing Database Home' chosen, with 'Database home display name' set to 'MyCustom23aiDBHome (23.5.0.24.07)'. The 'Create administrator credentials' section shows 'Username' as 'sys' and 'Password' as '\*\*\*\*\*'. The 'Create database' button is highlighted with a red rectangle. The right screenshot shows the 'Configure database backups' section. It has checkboxes for 'Enable automatic backups' (checked), 'Real-time data protection' (unchecked), and 'Take the first backup immediately' (checked). The 'Backup destination' is set to 'Autonomous Recovery Service (Recommended)'. The 'Protection policy in MyDemo' is set to 'Silver (35-days recovery window)'. The 'Deletion options after database termination' are set to 'Retain backups according to the protection policy retention period'. The 'Scheduled time for daily backup (UTC)' is set to 'Anytime'. The 'Encryption' tab is selected, showing 'Configure key management' with 'Use customer-managed keys' chosen. The 'Vault in FieldDemo' is set to 'MyDemoVault' and the 'Master encryption key in FieldDemo' is set to 'MyDemoKey'. The 'Create database' button is highlighted with a red rectangle.



# Oracle Key Vault Integration for Exadata Cloud@Customer

- You can Integrate your on-premises Oracle Key Vault (OKV) with Exadata Cloud@Customer to secure your critical data on-premises.
- Oracle Key Vault integration enables you to take complete control of your encryption keys and store them securely on an external, centralized key management device.
- OKV is optimized for Oracle wallets, Java keystores, and Oracle Advanced Security Transparent Data Encryption (TDE) master keys.
- OKV also provides a REST interface for clients to auto-enroll endpoints and setup wallets and keys.





# Exadata Database Service

## Pluggable Database Management

# Pluggable Database Lifecycle Management

- **Create additional PDBs** within the same container database (CDB)

Resources

Metrics

Backups (7)

Data Guard Associations (0)

**Pluggable Databases (1)**

Work requests (10)

## Pluggable Databases

Create pluggable database

Name	State	Refreshable clone	Created
<a href="#">MYPDB01</a>	● Available	No	Mon, May 20, 2024, 17:54:22 UTC

Showing 1 item < 1 of 1 >

Resources

Metrics

Backups (7)

Data Guard Associations (0)

**Pluggable Databases (2)**

Work requests (10)

## Pluggable Databases

Create pluggable database

Name	State	Refreshable clone	Created
<a href="#">MyPDB02</a>	● Available	No	Sat, May 25, 2024, 21:35:19 UTC
<a href="#">MYPDB01</a>	● Available	No	Mon, May 20, 2024, 17:54:22 UTC

Showing 2 items < 1 of 1 >



# Pluggable Database Lifecycle Management

From the the ***Pluggable Database Details page*** you can perform the following:

- **Connect to individual PDBs** using either Easy Connect or Long Connect strings
- **Open Performance Hub**
- **Clone PDB**

The screenshot shows the Oracle Exadata Database Service Pluggable Database Details page for a PDB named MYPDB01. The breadcrumb trail at the top is: Overview > Oracle Exadata Database Service on Dedicated Infrastructure > Exadata VM Cluster > Exadata VM Cluster Details > Database Home Details > Database Details > Pluggable Database Details. On the left, there is a green square with the text 'PDB' and 'AVAILABLE' below it. To the right of the square are buttons for 'PDB connection', 'Performance Hub', 'Clone' (highlighted with a red box), 'Start', and 'More actions'. Below these buttons is a section titled 'Database information' with a 'Tags' tab. Under 'Database information', there is a 'General information' section with the following details: 'Lifecycle state: Available', 'OCID: ...22ycwa' with 'Show' and 'Copy' links, 'Database: MyExaDB', 'Created: Mon, May 20, 2024, 17:54:22 UTC', 'Refreshable clone: No', and 'Open Mode: Read Write'. To the right of the 'General information' section is an 'Associated services' section with two items: 'Database Management: Not enabled' with an 'Enable' link and an information icon, and 'Ops Insights: Not enabled' with an 'Enable' link and an information icon.

# Pluggable Database Lifecycle Management

From the the ***Clone Pluggable Database page*** you can perform the following:

- **Clone the Source PDB**

- 1) ***Into same CDB***
- 2) ***Into another existing CDB***
- 3) ***As Refreshable Clone***

Clone pluggable database

Local clone  
Create a copy of the source PDB in the same database. ✓

Remote clone  
Create a copy of the source PDB in a different database.

Refreshable clone  
Create a refreshable copy of the source PDB in a different database.

Destination

Exadata VM Cluster in **MyDemo** (Change compartment)  
MyDemoVMCluster

Database Read-only  
MyExaDB

The destination database should be on the same or higher version than the source database

Configure new PDB

PDB name  
Database TDE wallet password

☐ Unlock the PDB admin account  
Provide a PDB admin password to unlock the PDB admin account.

☒ Take a backup of the PDB immediately after cloning it. ⓘ

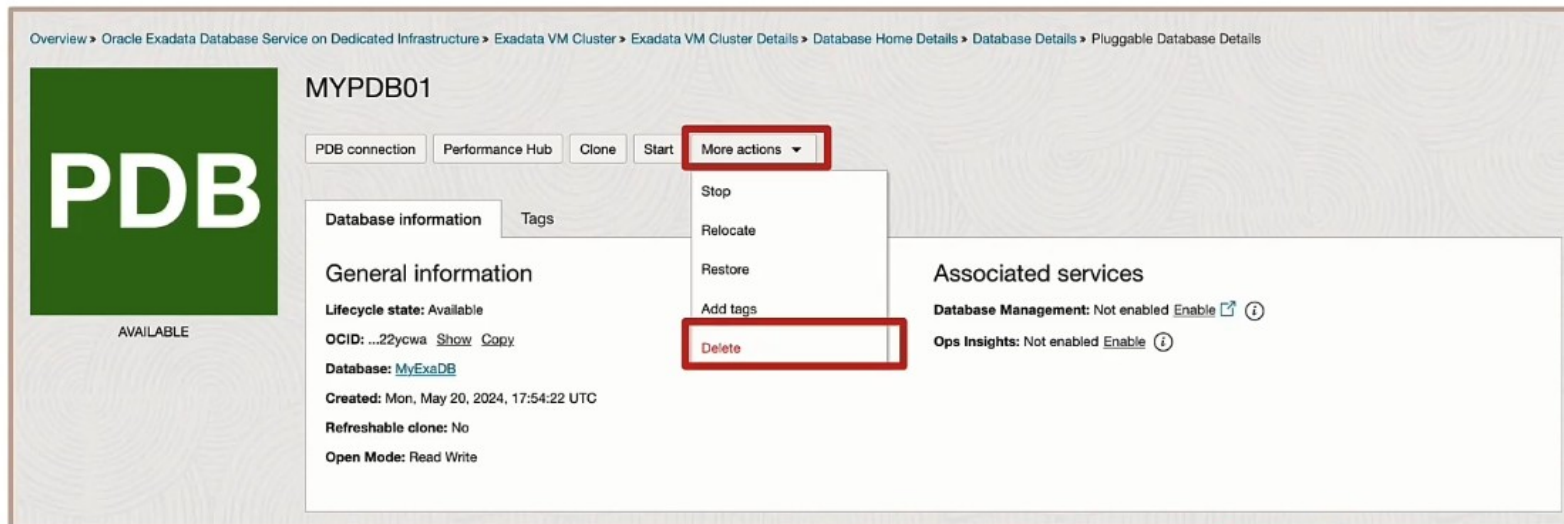
[Show advanced options](#)

Clone pluggable database Cancel

# Pluggable Database Lifecycle Management

From the **More Actions Tab** you can perform the following:

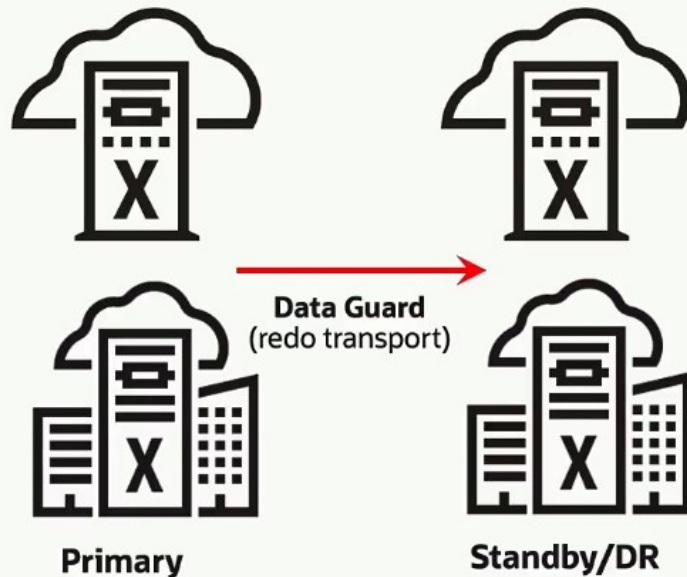
- ***Start and Stop a PDB***
- ***Relocate and Restore a PDB***
- ***Delete a PDB***



The screenshot displays the Oracle Exadata Database Service console interface for a Pluggable Database (PDB) named MYPDB01. The breadcrumb navigation at the top reads: Overview > Oracle Exadata Database Service on Dedicated Infrastructure > Exadata VM Cluster > Exadata VM Cluster Details > Database Home Details > Database Details > Pluggable Database Details. On the left, a green square with the text 'PDB' and 'AVAILABLE' below it represents the database status. The main content area shows the PDB name 'MYPDB01' and a row of action buttons: 'PDB connection', 'Performance Hub', 'Clone', 'Start', and 'More actions'. The 'More actions' button is highlighted with a red box, and its dropdown menu is open, showing options: 'Stop', 'Relocate', 'Restore', 'Add tags', and 'Delete'. The 'Delete' option is also highlighted with a red box. Below the buttons, the 'Database information' tab is active, displaying 'General information' for MYPDB01. The details include: Lifecycle state: Available; OCID: ...22ycwa (with Show and Copy links); Database: MyExaDB; Created: Mon, May 20, 2024, 17:54:22 UTC; Refreshable clone: No; and Open Mode: Read Write. To the right, the 'Associated services' section shows 'Database Management: Not enabled' (with Enable and info links) and 'Ops Insights: Not enabled' (with an Enable link).



# Enable Disaster Recovery & Local HA using Data Guard



## Data Guard / Active Data Guard Replication

- Real-time, database-optimized disaster recovery
- Zero data loss (RPO), near-zero recovery time (RTO)
- Cloud automation for Create/Delete/Switchover/Failover/Reinstate
- Asynchronous or synchronous replication

Enable Data Guard

Select peer VM Cluster

Peer region: Germany Central (Frankfurt)

Select availability domain: vmy-eu-frankfurt-1-ad-1

Select Exadata infrastructure in Frankfurt: MyExadata

Select a VM cluster in Frankfurt: MyExaVMCluster01

Oracle recommends that you place your peer VM cluster in a different Exadata infrastructure from the primary VM cluster to ensure maximum availability.

Data Guard association details

Data Guard Type: Active Data Guard

Active Data Guard is a licensed option for the Oracle Database Enterprise Edition and enables advanced capabilities that extend the basic Data Guard functionality. These capabilities include Real-Time Query and Data Guard Automatic Block Repair, Standby Block Change Tracking, Fast Sync, Oracle Data Services, and Application Continuity. [Learn more](#)

Data Guard: Oracle Data Guard ensures high availability, data protection, and disaster recovery for enterprise data. Data Guard provides a comprehensive set of services that create, maintain, manage, and monitor one or more standby databases to enable production Oracle databases to survive disasters and data corruptions. Data Guard maintains these standby databases as transactionally consistent copies of the production database. [Learn more](#)

Protection mode: Select protection mode

Transport type: First select protection mode

Choose Database Home

Select an existing Database Home | Create a new Database Home

Database Home display name: Choose Database Home

Only Database Homes compatible with the source database's Oracle Database version and patch level are listed.

Configure standby database

Database unique name: Optional

Specify a value for the DB\_UNIQUE\_NAME database parameter. This value must be unique across the primary and standby cloud VM clusters. Enter up to 30 characters. If not specified, the system automatically generates a database unique name value. [Learn more](#)

Database password

The standby database admin password must be the same as the primary database admin password.

Show advanced options

Enable Data Guard | Cancel

# Role Transitions: Switchover and Failover

## Oracle Data Guard supports two role-transition operations:

- **Switchover**

- Planned role reversal
- Reduces downtime for OS or hardware maintenance/upgrade & database patching

- **Failover**

- Unplanned role reversal
- Emergency use
- Invoked from Standby that will become the new Primary database
- Can enable automatic failover by manually configuring *fast-start failover*



# Data Guard Requirements

- Both DB Systems must be in the same compartment
- If your primary and standby databases are in the same region, then both must use the same virtual cloud network (VCN)
- If your primary and standby databases are in different regions, then you must peer the virtual cloud networks (VCNs) for each database
- The database versions must be the same
- Each database in a Data Guard association must have a unique name `DB_UNIQUE_NAME` value; the primary and standby database can use the same database name `DB_NAME` value
- Configure the security list ingress and egress rules for the subnets of both DB systems in the Oracle Data Guard association to enable TCP traffic to move between the applicable ports; ensure that the rules you create are stateful (the default)
- The minimum requirement for Oracle Data Guard to work is to enable egress for TCP traffic only for the SCAN listener port, which has a default of 1521











