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Oracle applications and solutions on Azure.

Oracle on Azure Documentation

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Oracle on Azure

Article • 12/13/2023

Customers running Oracle workloads on-premises can accelerate their cloud adoption by migrating their workloads to Azure. You have a choice to either lift and shift your Oracle workloads to Azure virtual machines or to Oracle Database@Azure. Additionally, you can also migrate to our Azure Database services like Azure SQL, Azure Database for PostgreSQL based on the requirements of your organization.

Oracle on Azure virtual machines

Microsoft Azure is an authorized cloud provider for customers to run Oracle workloads. Customers have been migrating their Oracle databases, and enterprise applications such as Siebel, PeopleSoft, JD Edwards, E-Business Suite, or customized WebLogic server applications to Azure infrastructure as part of their cloud migration journey.

Use Oracle on Azure virtual machines to run Oracle Database workloads on virtual machines in the cloud. This means you can easily deploy and manage Oracle databases without worrying about the underlying infrastructure. Whether you're a developer, a data analyst, or a business owner, Oracle on Azure Virtual Machines provides a flexible and scalable platform for running your Oracle databases.

Customers have a choice to run their Oracle workloads on Oracle published Oracle Linux image in the Azure Marketplace, RHEL or other endorsed OS with a flexible VM size and storage choice in native disk storage, file storage, block storage and as well as partner driven storage solutions.

Customers can either self-manage these Oracle workloads or can work with our partners for a managed database offering on Azure virtual machines.

For more information, see the Oracle workloads on Azure Virtual machine documentation.

Oracle Database@Azure

Oracle Database@Azure is our newest offering in partnership with Oracle that's now generally available. Oracle Database@Azure is an Oracle Cloud Infrastructure (OCI) database service offering secure, highly available, and highly performant mission critical databases running Oracle Exadata infrastructure in Azure datacenters.

You can purchase Oracle Database@Azure offering via Azure Marketplace. You can decrement your Microsoft Azure Consumption Commitment (MACC) for this offering along with a choice to either bring your own Oracle Database license or go with a license included option. You can use your Oracle support rewards to reduce your Oracle tech license support bill.

You can securely deploy the Exadata infrastructure and Oracle databases using your familiar Azure and OCI interfaces within your Azure virtual network for a low latency connectivity to your applications and the rest of the Azure services.

You can migrate your Oracle Databases to Oracle Database@Azure with familiar Oracle tooling like Oracle Zero Downtime Migration, Data Guard or GoldenGate. Oracle Database@Azure is a fully OCI managed and supported offering in partnership with Azure.

For more information, see the Oracle Database@Azure documentation.

Next steps

- Onboard with Oracle Database@Azure
- Provision and manage Oracle Database@Azure
- Oracle Database@Azure support information
- Network planning for Oracle Database@Azure
- Oracle Exadata Database Service on Dedicated Infrastructure

Oracle on Azure Documentation

Oracle applications and solutions on Azure.

Oracle on Azure Virtual Machines

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Oracle on Azure Virtual Machines

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Overview - Oracle Database@Azure

Article • 07/11/2024

Oracle Database@Azure is an Oracle database service running on Oracle Cloud Infrastructure (OCI), colocated in Microsoft data centers. This ensures that the Oracle Database@Azure service has the fastest possible access to Azure resources and applications.

Oracle Database@Azure allows you to subscribe to the Oracle Database Service inside your Azure environment. All infrastructure for your Oracle Database Service is located in Azure's physical data centers, giving your critical database workloads the high-performance and low-latency they require. Like other Azure services, Oracle Database@Azure uses an Azure Virtual Network for networking, managed within the Azure environment. The service uses the Azure tenancy's identity management and authorization, which can be either the Azure native identity service or a federated identity provider. The service allows you to monitor database metrics, audit logs, events, logging data, and telemetry natively in Azure.

Oracle Database@Azure runs on infrastructure managed by Oracle's expert Cloud Infrastructure operations team. The operations team performs software patching, infrastructure updates, and other operations through a connection to OCI. While the service requires that customers have an OCI tenancy, most service activities take place in the Azure environment.

Oracle Database@Azure interfaces

You can provision Oracle Database@Azure using the Azure portal and Azure APIs, SDKs and Terraform. Management of Oracle database system infrastructure and VM cluster resources takes place in the Azure portal as well.

For Oracle Container Databases (CDB) and Oracle Pluggable Databases (PDB), some management tasks are completed using the OCI console.

Database and application developers work in the Azure portal or use Azure tools (Azure API, SDK, Terraform) to interact with Oracle Database@Azure databases.

Purchase Oracle Database@Azure

To purchase Oracle Database@Azure, contact Oracle's sales team or your Oracle sales representative for a sale offer. Oracle Sales team creates an Azure Private Offer in the

Azure Marketplace for your service. After an offer has been created for your organization, you can accept the offer and complete the purchase in the Azure portal's Marketplace service. For more information on Azure private offers, see Overview of the commercial marketplace and enterprise procurement.

Billing and payment for the service is done through Azure. Payment for Oracle Database@Azure counts toward your Microsoft Azure Consumption Commitment (MACC). Existing Oracle Database software customers can use the Bring Your Own License (BYOL) option or Unlimited License Agreements (ULAs). On your regular Microsoft Azure invoices, you can see charges for Oracle Database@Azure alongside charges for your other Azure Marketplace services.

Compliance

Oracle Database@Azure is an Oracle Cloud database service that runs Oracle Database workloads in a customer's Azure environment. Oracle Database@Azure offers various Oracle Database Services through customer's Microsoft Azure environment. This service allows customers to monitor database metrics, audit logs, events, logging data, and telemetry natively in Azure. It runs on infrastructure managed by Oracle's Cloud Infrastructure operations team who performs software patching, infrastructure updates, and other operations through a connection to Oracle Cloud.
All infrastructure for Oracle Database@Azure is co-located in Azure's physical data centers and uses Azure Virtual Network for networking, managed within the Azure environment. Federated identity and access management for Oracle Database@Azure is provided by Microsoft Entra ID.

For detailed information on the compliance certifications please visit Microsoft Services Trust Portal and Oracle compliance website. If you have further questions about OracleDB@Azure compliance please reach out to your account team and/or get information through Oracle and Microsoft support for Oracle Database@Azure.

Available regions

Oracle Database@Azure is available in the following locations. Oracle Database@Azure infrastructure resources must be provisioned in the Azure regions listed.

Expand table

Azure region	Oracle Exadata Database@Azure	Oracle Autonomous Database@Azure
East US	✓	✓
Germany West Central	✓	✓
France Central	✓	✓
UK South	✓	✓
Canada Central	✓	✓
Australia East	✓	✓

Azure Support scope and contact information

See Contact Microsoft Azure Support in the Azure documentation for information on Azure support. For SLA information about the service offering, please refer to the Oracle PaaS and IaaS Public Cloud Services Pillar Document

Next steps

- Onboard with Oracle Database@Azure
- Provision and manage Oracle Database@Azure
- Oracle Database@Azure support information
- Network planning for Oracle Database@Azure
- Groups and roles for Oracle Database@Azure

Feedback

Onboard with Oracle Database@Azure

Article • 12/13/2023

In this article, you learn how to subscribe to the Oracle Database@Azure service in your Azure environment.

Before subscribing to Oracle Database@Azure, review the prerequisites in this documentation and contact Oracle Sales if Oracle hasn't created an Azure private offer for your organization.

Prerequisites

To use the Oracle Database@Azure, you need the following items:

- An existing Azure subscription.
- An Azure virtual network with a subnet delegated to the Oracle Database@Azure service `Oracle.Database/networkAttachments`.

If you don't have an Oracle Cloud (OCI) account, you can create one during your service deployment. If you do have an OCI account, you can use it with Oracle Database@Azure.

Optionally, you can create identity federation for your OCI account so that users can access the OCI tenancy using an Azure sign in. You must perform certain Oracle Database@Azure tasks related to Container Database (CDB) and Pluggable Database (PDB) management in the OCI console. If you choose not to federate your OCI tenancy with Azure's identity service, you must create OCI users using the OCI Identity and Access Management (IAM) service. For more information on creating identity federation using Azure's identity service, see Identity Federation in the Oracle Multicloud documentation using Azure's identity service.

Step 1: Purchase Oracle Database@Azure in the Azure portal

1. Sign in to your Azure account.
2. Navigate to the Marketplace service in the Azure portal. See What is Azure Marketplace? in the Azure documentation for more information on Azure Marketplace.

Alternately, if you received an email from Azure with a link to your private offer, you can select the link to go to your offer in the Azure portal. Skip to step 4 if you selected a link to your offer and are viewing it in the Azure portal.

3. In Azure Marketplace, under **Management**, select **Private Offer Management**.

4. In the list of private offers, select the **View + accept** button in the row for the Oracle Database@Azure offer.

5. Review the offer details, then accept and subscribe to the private offer. For more information on private offers in the Azure Marketplace, see Private offers in Azure Marketplace

   To accept and subscribe to the private offer:
   a. Review the terms and conditions by clicking the "terms and conditions" link on the private offer page under **Private Offer's attachments and addendum**.
   b. Select the checkbox for **I have read the offer's terms and conditions** after reviewing the terms and conditions.
   c. Select the **Accept Private Offer** button. After a few moments, your browser will redirect to the **Private Offer Management** page.
   d. On the **Private Offer Management** page, the status of the private offer shows **Preparing for purchase**. After 10 to 15 minutes, the status updates to **Ready** and the **Purchase** button is enabled. Once the **Purchase** button is enabled, select it to continue. Your browser redirects to the **Create OracleSubscription** page.

6. On the **Create OracleSubscription** page, select the **Basics** tab under **Project details** if this tab isn't already selected.

7. Use the **Subscription** selector to select your subscription if it isn't already selected.

8. In the Instance details section, enter "default" (with no quotation marks) in the Name field.review the information in the following fields, which are configured for you:

   - **Name**: This field is automatically set to “default”.
   - **Region**: This field is automatically set to “Global”.
   - **Plan and Billing term**: The values in these fields are automatically set for your offer, and you don't need to set or change these values.

9. Select **Review + create** to continue.

10. On the **Review + create** tab, review the information about your service and the **Marketplace terms of use**, then select **Create**. The Azure portal redirects to the

deployment details for the Oracle Database@Azure service. The deployment of the service takes a few minutes.

11. When the page displays the **Your deployment is complete** message, select the **Go to resource** button under **Next steps**. Your browser redirects to the deployment details page. The **Purchase status** for your private offer shows **Subscribed**.

Step 2: Select your Oracle Cloud account

1. After completing your purchase of Oracle Database@Azure in the Azure portal, you need to choose an Oracle Cloud Infrastructure (OCI) account to use with your Oracle Database@Azure subscription service. You can choose to create a new account, or to use an existing account. Your OCI account is used for the provisioning and management of container databases (CDBs) and Pluggable databases (PDBs). Your OCI account also allows Oracle to provide infrastructure and software maintenance updates for your database service. Oracle will send you an email about creating an OCI account and tenancy for your Azure service after you complete the creation of the service described in the previous step.

2. In the email you receive from Oracle, select either the **Create new cloud account** button or the **Add to existing cloud account** button, depending on whether you want to create a new OCI account for the service or link the service to an existing OCI account.

    - For new accounts, follow the instructions provided in If you need to create a new cloud account in the Oracle Cloud documentation.
    - To link an existing account, follow the instructions provided in If you already have an existing cloud account in the Oracle Cloud documentation.

Step 3 (optional): Create identity federation using Azure's identity service

Optionally, you can use Microsoft Entra ID for federated identity and access management. To set up identity federation using Azure's identity service, follow the directions in the Identity Federation article in the Oracle Multicloud documentation.

Next steps

- Overview - Oracle Database@Azure
- Provision and manage Oracle Database@Azure

- Oracle Database@Azure support information
- Network planning for Oracle Database@Azure
- Groups and roles for Oracle Database@Azure

Network planning for Oracle Database@Azure

Article • 03/15/2024

In this article, you learn about the topologies and constraints for Oracle Database@Azure. After you purchase the offer through Azure Marketplace and provision the Exadata infrastructure, you'll then need to create your virtual machine cluster that will host your Oracle Exadata Database. These Oracle database clusters are connected to your Azure virtual network via a virtual NIC from your delegated subnet (delegated to `Oracle.Database/networkAttachement`).

Supported topologies

The following table describes the network topologies supported by each network features configuration of Oracle Database@Azure.

Expand table

Topology	Supported
Connectivity to Oracle database cluster in a local virtual network	Yes
Connectivity to Oracle database cluster in a peered virtual network (Same region)	Yes
Connectivity to Oracle database cluster in a spoke VNet in a different region with VWAN	Yes
Connectivity to Oracle database cluster in a peered virtual network* (Cross region or global peering)* without VWAN	No
On-premises connectivity to Oracle database cluster via Global and Local Expressroute	Yes
ExpressRoute (ER) FastPath	No
Connectivity from on-premises to Oracle database cluster in a spoke virtual network over ExpressRoute gateway and virtual network peering with gateway transit	Yes
On-premises connectivity to Delegated Subnet via VPN GW	Yes
Connectivity from on-premises to Oracle database in a spoke virtual network over VPN gateway and virtual network peering with gateway transit	Yes
Connectivity over Active/Passive VPN gateways	Yes

Topology	Supported
Connectivity over Active/Active VPN gateways	No
Connectivity over Active/Active Zone Redundant gateways	No
Transit connectivity via vWAN for Oracle database cluster provisioned in spoke virtual networks	Yes
On-premises connectivity to Oracle database cluster via vWAN attached SD-WAN	No
On-premises connectivity via Secured HUB (Firewall NVA)	No
Connectivity from Oracle database cluster on Oracle Database@Azure nodes to Azure resources	Yes

- You can overcome this limitation by setting Site-to-Site VPN.

Constraints

The following table describes the configuration of supported network features:

Expand table

Features	Basic network features
Delegated subnet per virtual network	1
Network Security Groups on Oracle Database@Azure-delegated subnets	No
User-defined routes (UDRs) on Oracle Database@Azure-delegated subnets	Yes
Connectivity from Oracle database cluster to private endpoints in the same virtual network on Azure-delegated subnets	No
Connectivity from Oracle database cluster to private endpoints in a different spoke virtual network connected to vWAN	Yes
Load balancers for Oracle database cluster traffic	No
Dual stack (IPv4 and IPv6) virtual network	IPv4 only supported.

Next steps

- Overview - Oracle Database@Azure

- Onboard with Oracle Database@Azure
- Provision and manage Oracle Database@Azure
- Oracle Database@Azure support information
- Groups and roles for Oracle Database@Azure

Groups and roles for Oracle Database@Azure

Article • 12/13/2023

This article lists the groups and roles used to manage access to Oracle Database@Azure. Using these groups and roles ensures that assigned users have the appropriate permissions to operate the service.

Groups and roles in Azure

Use the following groups in your Azure account.

Expand table

Group name	Azure role assigned	description
odbaa-exa-infra-administrators	odbaa-exa-infra-administrator	This group is for administrators who need to manage all Oracle Exadata Database Service resources in Azure
odbaa-vm-cluster-administrators	odbaa-vm-cluster-administrator	User in this group can administer VM cluster resources in Azure
odbaa-db-family-administrators	*not applicable*	This group is replicated in OCI during the optional identity federation process. OCI policies are defined for this group in the Oracle Cloud environment.
odbaa-db-family-readers	*not applicable*	This group is replicated in OCI during the optional identity federation process. OCI policies are defined for this group in the Oracle Cloud environment.
odbaa-exa-cdb-administrators	*not applicable*	This group is replicated in OCI during the optional identity federation process. OCI policies are defined for this group in the Oracle Cloud environment.
odbaa-exa-pdb-administrators	*not applicable*	This group is replicated in OCI during the optional identity federation process. OCI policies are defined for this group in the Oracle Cloud environment.

Groups in Oracle Cloud Infrastructure

Use the following groups in your Oracle Cloud Infrastructure (OCI) tenancy.

Expand table

Group name	Description
odbaa-db-family-administrators	Users this group are administrators who manage database family actions.
odbaa-db-family-readers	Users this group are administrators who read database family actions.
odbaa-exa-cdb-administrators	Users this group are administrators who manage Oracle Container Database (CDB) actions.
odbaa-exa-pdb-administrators	Users this group are administrators who manage Oracle Pluggable Database (PDB) actions.

Next steps

- Overview - Oracle Database@Azure
- Onboard with Oracle Database@Azure
- Provision and manage Oracle Database@Azure
- Oracle Database@Azure support information

Overview of provisioning

Article • 06/11/2024

Oracle Database@Azure (OracleDB@Azure) provides you seamless integration of Oracle resources within your Microsoft Azure cloud environment.

You access the OracleDB@Azure service through the Microsoft Azure portal. You create and manage Oracle Exadata Infrastructure and Oracle Exadata VM Cluster resources with direct access to the Oracle Cloud Infrastructure (OCI) portal for creation and management of Oracle Exadata Databases, including all Container Databases (CDBs) and Pluggable Databases (PDBs).

There are IP address requirement differences between Oracle Database@Azure and Oracle Cloud Infrastructure (OCI). In the Requirements for IP Address Space documentation, the following changes for Oracle Database@Azure must be considered.

- Oracle Database@Azure only supports Exadata X9M. Other shapes are unsupported.
- Oracle Database@Azure reserves 13 IP addresses for the client subnet versus 3 for OCI requirements.

The following topics provide detailed information about creating and managing tasks associated with each resource type.

- Provision Exadata infrastructure
- Provision an Exadata VM Cluster
- Provision Oracle autonomous databases
- Use HashiCorp Terraform to provision Oracle Database@Azure
- Manage resources for Oracle Database@Azure
- Troubleshoot provisioning issues

For more information on specific database topics beyond their implementation and use within OracleDB@Azure, see the following topics:

- Exadata Database Service on Dedicated Infrastructure
- Manage Databases on Exadata Cloud Infrastructure
- Using Oracle Autonomous Database Serverless

Feedback

Was this page helpful? Yes No

Provide product feedback

Provision Exadata infrastructure

Article • 06/11/2024

Provisioning Oracle Exadata Infrastructure is a time-consuming process. Provisioning an Oracle Exadata Infrastructure is a prerequisite for provisioning Oracle Exadata VM Clusters and any Oracle Exadata Databases.

> **Note**
>
> To ensure you have all the information needed for a successful provisioning flow, review the Troubleshoot provisioning issues document specifically the IP Address Requirement Differences.

1. Provision your Oracle Exadata Infrastructure and Oracle Exadata VM Cluster resources from the OracleDB@Azure blade. By default, the Oracle Exadata Infrastructure tab is selected. To create an Oracle Exadata VM Cluster resource, select that tab first.

2. Select the + **Create** icon at the top of the blade to begin the provisioning flow.

3. Check that you're the **Create** Oracle Exadata Infrastructure flow. If not, exit the flow.

4. From the **Basics** tab of the Create Oracle Exadata Infrastructure flow, enter the following information.
   a. Select the Microsoft Azure subscription to which the Oracle Exadata Infrastructure will be provisioned and billed.
   b. Select an existing **Resource group** or select the **Create new** link to create and use a new Resource group for this resource. A resource group is a collection of resources sharing the same lifecycle, permissions, and policies.
   c. Enter a unique **Name** for the Oracle Exadata Infrastructure on this subscription.
   d. Select the **Region** where this Oracle Exadata Infrastructure is provisioned.

      > **Note**
      >
      > The regions where the OracleDB@Azure service is available are limited.

   e. Select the **Availability zone** where this Oracle Exadata Infrastructure is provisioned.

      > **Note**

> The availability zones where the OracleDB@Azure service is available are limited.

f. The **Oracle Cloud account name** field is display-only. If the name isn't showing correctly, your OracleDB@Azure account setup hasn't been successfully completed.
g. Select **Next** to continue.

5. From the **Configuration** tab of the Create Oracle Exadata Infrastructure flow, enter the following information.
   a. From the dropdown list, select the **Exadata infrastructure model** you want to use for this deployment. **NOTE:** Not all Oracle Exadata Infrastructure models are available. For more information, see Oracle Exadata Infrastructure Models.
   b. The **Database servers** selector can be used to select a range from 2 to 32.
   c. The **Storage servers** selector can be used to select a range from 3 to 64.
   d. The **OCPUs** and **Storage** fields are automatically updated based on the settings of the Database servers and Storage servers selectors.
   e. Select **Next** to continue.

6. From the **Maintenance** tab of the Create Oracle Exadata Infrastructure flow, enter the following information.
   a. The **Maintenance method** is selectable to either Rolling or Nonrolling based on your patching preferences.
   b. By default, the **Maintenance schedule** is set to **No preference**.
   c. If you select **Specify a schedule for the Maintenance schedule**, other options open for you to tailor a maintenance schedule that meets your requirements. Each of these selections requires at least one option in each field.
   d. You can then enter up to 10 **Names** and **Email addresses** that are used as contacts for the maintenance process.
   e. Select **Next** to continue.

7. From the **Consent** tab of the Create Oracle Exadata Infrastructure flow, you must agree to the terms of service, privacy policy, and agree to access permissions. Once accepted, select **Next** to continue.

8. From the **Tags** tab of the Create Oracle Exadata Infrastructure flow, you define Microsoft Azure tags.

> **Note**
>
> These tags aren't propagated to the Oracle Cloud Infrastructure (OCI) portal.

9. After you create the tags, if any, for your environment, select **Next** to continue.
10. From the **Review _+** create tab of the Create Oracle Exadata Infrastructure flow, a short validation process is run to check the values that you entered from the previous steps. If the validation fails, you must correct any errors before you can start the provisioning process.
11. Select the **Create** button to start the provisioning flow.
12. Return to the Oracle Exadata Infrastructure blade to monitor and manage the state of your Oracle Exadata Infrastructure environments.

Provision an Exadata VM Cluster

Article • 06/11/2024

Provisioning an Oracle Exadata VM Cluster requires the existence of an Oracle Exadata Infrastructure, and is a prerequisite for Oracle Exadata Databases that runs on the cluster.

> **Note**
>
> Review the Troubleshoot provisioning issues, specifically the IP Address Requirement Differences, to ensure you have all the information needed for a successful provisioning flow.

1. You provision Oracle Exadata Infrastructure and Oracle Exadata VM Cluster resources from the OracleDB@Azure blade. By default, the Oracle Exadata Infrastructure tab is selected. To create an Oracle Exadata VM Cluster resource, select that tab first.
2. Select the + **Create** icon at the top of the blade to begin the provisioning flow.
3. Check that you're using the **Create** Oracle Exadata VM Cluster flow. If not, exit the flow.
4. From the **Basics** tab of the Create Oracle Exadata VM Cluster flow, enter the following information.

   > **Note**
   >
   > Before you can provision an Oracle Exadata VM Cluster, you must have a provisioned Oracle Exadata Infrastructure, which you'll assign for your Oracle Exadata VM Cluster.

   a. Select the Microsoft Azure subscription to which the Oracle Exadata VM Cluster will be provisioned.
   b. Select an existing **Resource group** or select the **Create new** link to create and use a new Resource group for this resource.
   c. Enter a unique **Name** for the Oracle Exadata VM Cluster on this subscription.
   d. Select the **Region** where this Oracle Exadata Infrastructure is provisioned.

      > **Note**

> The regions where the OracleDB@Azure service is available are limited, and you should assign the Oracle Exadata VM Cluster to the same region as the parent Oracle Exadata Infrastructure.

e. The **Cluster name** should match the Name to avoid other naming conflicts.
f. Select the existing **Exadata infrastructure** that is the parent for your Oracle Exadata VM Cluster.
g. The **License type** is either **License included** or **Bring your own license (BYOL)**. Your selection affects your billing.
h. The default **Time zone** is UTC. There's also an option to **Select another time zone**.
i. If you choose the **Select another time zone** option, two more required fields open, **Region or country** and **Selected time zone**. Both of these fields are drop-down lists with selectable values. Once you select the **Region or country**, the **Selected time zone** is populated with the available values for that **Region or country**.
j. The **Grid Infrastructure Version** is selectable based on your previous selections. The **Grid Infrastructure Version** limits the Oracle Database versions that the Oracle Exadata VM Cluster supports.
k. If selected, the **Choose Exadata Image version** checkbox allows you to select whether or not to **Include Exadata Image minor versions** as selectable, and then to choose the specific **Exadata Image version** from the drop-down field based on whether or not you allowed **Include Exadata Image minor versions**.
l. The **SSH public key source** can be selected to **Generate new key pair**, **Use existing key stored in Azure**, or **Use existing public key**. If you select **Generate new key pair**, you must give your newly generated key a unique name. If you select **Use existing key stored in Azure**, you must select that key from a dropdown of defined key for your subscription. If you select **Use existing public key**, you must provide an RSA public key in sing-line format (starting with "ssh-rsa") or the multi-line PEM format. You can generate SSH keys using ssh-keygen or Linux and OS X, or PuTTYGen on Windows.
m. Select Next to continue.

5. From the **Configuration** tab of the Create Oracle Exadata VM Cluster flow, enter the following information.
   a. The **Change database servers** checkbox is optional. If selected, it allows you to select a minimum of two (2) database servers for VM cluster placement. Maximum resources vary based on allocation per VM cluster based on the number of database servers. Select from the available configurations.
   b. **Database servers** and **System Model** fields are read-only and based on the available resources.

c. The **OCPU count per VM**, **Memory per VM**, and **Local storage per VM** are limited by the Oracle Exadata Infrastructure.
d. **Total requested OCPU count**, **Total requested memory**, and **Total local storage** are computed based on the local values that you accept or select.
e. **Usable Exadata Storage (TB)** is limited by the Oracle Exadata Infrastructure.
f. **Use Exadata sparse snapshots**, **Use local backups**, and **Usable storage allocation** are options that can only be set at this time before the Oracle Exadata VM Cluster has been provisioned.
g. Select **Next** to continue.

6. From the **Networking** tab of the Create Oracle Exadata VM Cluster flow, enter the following information.
   a. The **Virtual network** is limited based on the **Subscription** and **Resource group** that you selected earlier in the provisioning flow.
   b. The **Client subnet** is selectable based on the selected **Virtual network**.
   c. To use a custom DNS domain, select the **Custom DNS** checkbox. If unchecked, the Oracle Exadata VM Cluster uses the default domain, oraclevcn.com.
   d. If checked, a list of existing DNS private views from OCI is presented. Select the view to use. To create a new private view and zones, see Private DNS.
   e. Enter the **Host name** prefix. The prefix forms the first portion of the Oracle Exadata VM Cluster host name.
   f. The **Host domain name** and **Host and domain URL** for your Oracle Exadata VM Cluster are read-only and populated with derived naming.
   g. Within the **Network ingress rules** section, the **Add additional network ingress rules** checkbox allows you to define addition ingress CIDR rules. Other network CIDR ranges (such as application or hub subnet ranges) can be added, during provisioning, to the network security group (NSG) ingress rules for the VM cluster. The selected virtual network's CIDR is added by default. CIDR ranges are specified. The port can be a single port, port range (for example, 80-8080), a comma-delimited list of ports (for example, 80,8080), or any combination of these port ranges. This only updates the OCI network security group ingress rules. Microsoft Azure virtual network security rules must be updated in the specific virtual network in Microsoft Azure.
   h. Select **Next** to continue.

7. From the **Diagnostics Collection** tab of the Create Oracle Exadata VM Cluster flow allows you to specify the diagnostic events, health monitoring, and incident logs and tracing that Oracle can use to identify, track, and resolve issues. Select **Next** to continue.

8. From the **Consent** tab of the **Create Oracle Exadata VM Cluster** flow, you must agree to the terms of service, privacy policy, and agree to access permissions.

Select **Next** to continue.

9. From the **Tags** tab of the Create Oracle Exadata VM Cluster flow, you can define Microsoft Azure tags. **NOTE:** These tags aren't propagated to the Oracle Cloud Infrastructure (OCI) portal. Select **Next** to continue.

10. From the **Review + create** tab of the Create Oracle Exadata VM Cluster flow, a short validation process is run to check the values that you entered from the previous steps. If the validation fails, you must correct any errors before you can start the provisioning process.

11. Select the **Create** button to start the provisioning flow.

12. Return to the Oracle Exadata VM Cluster blade to monitor and manage the state of your Oracle Exadata VM Cluster environments.

Provision Oracle Autonomous Databases

Article • 06/11/2024

This article discusses how to provision and conduct basic management functions for an Oracle Autonomous Database Serverless instance from the Oracle Autonomous Database@Azure blade. More management functions are available within the Oracle Cloud Infrastructure (OCI) portal available via the link to that Oracle Autonomous Database from the Oracle Autonomous Database@Azure blade.

1. Provision an Oracle Autonomous Database instance from the Microsoft Azure portal. Select the Oracle Autonomous Database@Azure blade.

2. There are two paths to begin the Oracle Autonomous Database instance provisioning flow.
   a. From the Oracle Autonomous Database@Azure application Home, select the **Create an Oracle Autonomous Database** button.
   b. From the Oracle Autonomous Database blade, select the **+ Create** at the top of the blade. The Oracle Autonomous Database@Azure blade shows all your existing Autonomous Databases along with their current status. Selecting a specific Autonomous Database shows you detailed information of that instance.

3. From the **Basics** tab of the Create Oracle Autonomous Database flow, enter the following information.
   a. The **Subscription** field is a drop-down containing the current subscription, plus any other subscriptions that your account can access.
   b. The **Resource group** field is a drop-down containing the existing resource groups.
   c. To create a new Resource group, select the **Create new** link.
   d. Enter a **Name** for your Oracle Autonomous Database Serverless instance. This name must be unique within your subscription.
   e. Select the **Region**. The current region is automatically selected. If your subscription has access to other regions, those regions appear in the drop-down list.
   f. Select the **Next** button to continue the provisioning flow.

4. From the **Configuration** tab of the Created Oracle Autonomous Database flow, enter the following information.
   a. The **Workload type** is a drop-down list that provides all the options for your Oracle Autonomous Database Serverless instance. Select the appropriate option

from the list.

b. The **Database version** is a drop-down list that allows you to select the options provided by your subscription and the currently supported versions of Oracle Autonomous Database Serverless.
c. The **ECPU count** is a slider UI that allows setting the ECPU count from 2 to 512.
d. The **Compute auto scaling** checkbox allows you to option for your Oracle Autonomous Database to scale its computing allocation automatically up to 512. By default, this is selected.
e. The **Storage** is a slider UI that allows setting the Storage allocation from 1 TB to 383 TB or 20 GB to 393,216 GB.
f. The **Storage unit size** radio button allows you to select whether your storage is allocated in GB or TB.
g. The **Storage auto scaling** checkbox allows you to option for your Oracle Autonomous Database to scale its storage allocation automatically up to 383 TB or 393,216 GB. By default, this is unselected.
h. The **Backup retention period in days** is a slider UI that allows setting the backup retention days to vary from 1 to 60.
i. The **Username** is a read-only field that is set to **ADMIN**.
j. Enter a password for your **ADMIN** account. Passwords must be nonempty, between 12 and 60 characters, and contain at least one uppercase letter, one lowercase letter, and one number. The password can't contain the double quote (") character or the username ADMIN.
k. The **Confirm password** field must match your previously entered password.
l. The **License type** is a drop-down list of available license types, **License included** and **Bring your own license**. Select the one that is needed for your subscription.
m. If you select the **Advanced options** checkbox, two (2) other fields appear, **Character set** and **National character set**. These are drop-down lists of the available character set options for your database. If you select the Advanced options checkbox, select the appropriate Character set and National character set for your database.
n. Select the **Next** button to continue the provisioning flow.

5. From the **Networking** tab of the Create Oracle Autonomous Database flow, enter the following information.
   a. Access type drop-down allows you to select Secure access from everywhere, Managed private virtual network IP only, or Secure access from allowed IPs.
   b. For Secure access from everywhere, the Require mutual TLS (mTLS) authentication is selected and can't be unselected.
   c. For Managed private virtual network IP only, the Require mutual TLS (mTLS) authentication is unselected by default and can be selected if desired. Additionally, the Virtual network and Subnet drop-downs allow you to select

from existing resources, and they're required for Managed private virtual network IP only access.

d. For Secure access from allowed IPs, the Require mutual TLS (mTLS) authentication is unselected by default and can be selected if desired. The Access control rule must be entered in the IP addresses/CIDR blocks field using individual IP addresses, IP address ranges, or CIDR notation.

e. Select the Next button to continue the provisioning flow.

6. From the Maintenance tab of the Create Oracle Autonomous Database flow, enter the following information.

   a. The Maintenance patch level is a read-only field. Your Oracle Autonomous Database is patched on a regular and as-needed basis. This patching is done in a manner that should be unnoticeable to you. Regular means that the typical patch schedule is applied. For more information, see View Patch and Maintenance Window Information, Set the Patch Level.

   b. You can enter up to 10 contact email addresses for notification of unplanned maintenance events.

   c. Select the Next button to continue the provisioning flow.

7. From the **Consent tab** of the Create Oracle Autonomous Database flow, review the Oracle terms of use and the Oracle privacy policy. When reviewed, select the I agree to the terms of service checkbox to continue. Select the Next button to continue the provisioning flow.

8. From the Tags tab of the Create Oracle Autonomous Database flow, set one or more tags to enable easier management and tracking of multiple Oracle Autonomous Databases. For more information, see Use tags to organize your Azure resources and management hierarchy.

9. From the Review + Create tab of the Create Oracle Autonomous Database flow, check the field values you have entered. Validation occurs as you enter this page, and all validations must pass for the provisioning to be started. Even if the validation passes, it's possible you entered some of the values incorrectly.

10. Once your validations complete successfully and you have reviewed the values, select the **Create** button to start the provisioning process.

11. The provisioning process starts. You return to the Oracle Autonomous Database@Azure blade. You can see the status of your provisioning processes. Assuming your process succeeds, select that successful entry in the list.

12. This is the basic information for your Oracle Autonomous Database Serverless instance. You can perform functions shared with Microsoft Azure. For most

administrative functions for the database, select the Go to OCI link under the OCI Database URL field.

13. For the complete documentation on using an Oracle Autonomous Database, see Using Oracle Autonomous Database Serverless .

Use HashiCorp Terraform to provision Oracle Database@Azure

Article • 06/11/2024

You can provision and manage resources for Oracle Database@Azure using the Terraform tool that enables you to provision and manage infrastructure in Oracle Cloud Infrastructure (OCI).

The OCI mechanism for Terraform provisioning and management is done via JSON scripts. Here are sample scripts.

> **Note**
>
> This document describes examples of provisioning and management of Oracle Database@Azure resources through Terraform provider AzAPI. See the The AzAPI TF provider resources and data sources.

The API spec version used in the examples is "2023-09-01-preview" as denoted in the "type" field in the examples. This is changed to the public version when it's made available.

Create an Oracle Exadata Infrastructure

```
resource "azapi_resource" "resource_group" {
  type     = "Microsoft.Resources/resourceGroups@2023-07-01"
  name     = "ExampleRG"
  location = "eastus"
}

// OperationId: CloudExadataInfrastructures_CreateOrUpdate,
CloudExadataInfrastructures_Get, CloudExadataInfrastructures_Delete
// PUT
/subscriptions/{subscriptionId}/resourceGroups/{resourceGroupName}/providers
/Oracle.Database/cloudExadataInfrastructures/{cloudexadatainfrastructurename
}
resource "azapi_resource" "cloudExadataInfrastructure" {
  type      = "Oracle.Database/cloudExadataInfrastructures@2023-09-01-
preview"
  parent_id = azapi_resource.resource_group.id
  name      = "ExampleName"
  body = jsonencode({
    "location" : "eastus",
```

```
    "zones" : [
      "2"
    ],
    "tags" : {
      "createdby" : "ExampleName"
    },
    "properties" : {
      "computeCount" : 2,
      "displayName" : "ExampleName",
      "maintenanceWindow" : {
        "leadTimeInWeeks" : 0,
        "preference" : "NoPreference",
        "patchingMode" : "Rolling"
      },
      "shape" : "Exadata.X9M",
      "storageCount" : 3
    }
  })
  schema_validation_enabled = false
}
```

List Oracle Exadata Infrastructures by subscription

```
data "azapi_resource" "subscription" {
  type                   = "Microsoft.Resources/subscriptions@2020-06-01"
  response_export_values = ["*"]
}

// OperationId: CloudExadataInfrastructures_ListBySubscription
// GET
/subscriptions/{subscriptionId}/providers/Oracle.Database/cloudExadataInfras
tructures
data "azapi_resource_list" "listCloudExadataInfrastructuresBySubscription" {
  type       = "Oracle.Database/cloudExadataInfrastructures@2023-09-01-
preview"
  parent_id  = data.azapi_resource.subscription.id
}
```

List Oracle Exadata Infrastructures by Resource Group

```
data "azurerm_resource_group" "example" {
  name = "existing"
}

// OperationId: CloudExadataInfrastructures_ListByResourceGroup
// GET
/subscriptions/{subscriptionId}/resourceGroups/{resourceGroupName}/providers
/Oracle.Database/cloudExadataInfrastructures
data "azapi_resource_list" "listCloudExadataInfrastructuresByResourceGroup"
{
  type       = "Oracle.Database/cloudExadataInfrastructures@2023-09-01-
preview"
  parent_id  = azurerm_resource_group.example.id
}
```

Patch an Oracle Exadata Infrastructure

> **Note**
>
> Only Microsoft Azure tags on the resource can be updated through the AzAPI provider.

```
data "azapi_resource" "subscription" {
  type                   = "Microsoft.Resources/subscriptions@2020-06-01"
  response_export_values = ["*"]
}

// OperationId: CloudExadataInfrastructures_Update
// PATCH
/subscriptions/{subscriptionId}/resourceGroups/{resourceGroupName}/providers
/Oracle.Database/cloudExadataInfrastructures/{cloudexadatainfrastructurename
}
resource "azapi_resource_action" "patch_cloudExadataInfrastructure" {
  type        = "Oracle.Database/cloudExadataInfrastructures@2023-09-01-
preview"
  resource_id = azapi_resource.cloudExadataInfrastructure.id
  action      = ""
  method      = "PATCH"
  body = jsonencode({
    "tags" : {
      "updatedby" : "ExampleName"
    }
```

```
  })
}
```

List Database Servers on an Oracle Exadata Infrastructure

```

// OperationId: DbServers_Get
// GET
/subscriptions/{subscriptionId}/resourceGroups/{resourceGroupName}/providers
/Oracle.Database/cloudExadataInfrastructures/{cloudexadatainfrastructurename
}/dbServers/{dbserverocid}
data "azapi_resource" "dbServer" {
  type      = "Oracle.Database/cloudExadataInfrastructures/dbServers@2023-
09-01-preview"
  parent_id = azapi_resource.cloudExadataInfrastructure.id
  name      = var.resource_name
}
```

Create an Oracle Exadata virtual machine cluster

```

resource "azapi_resource" "resource_group" {
  type     = "Microsoft.Resources/resourceGroups@2023-07-01"
  name     = "ExampleRG"  location = "eastus"
}

// OperationId: CloudExadataInfrastructures_CreateOrUpdate,
CloudExadataInfrastructures_Get, CloudExadataInfrastructures_Delete
// PUT
/subscriptions/{subscriptionId}/resourceGroups/{resourceGroupName}/providers
/Oracle.Database/cloudExadataInfrastructures/{cloudexadatainfrastructurename
}
resource "azapi_resource" "cloudExadataInfrastructure" {
  type      = "Oracle.Database/cloudExadataInfrastructures@2023-09-01-
preview"
  parent_id = azapi_resource.resource_group.id
  name      = "ExampleName"
  body = jsonencode({
    "location" : "eastus",
    "zones" : [
      "2"
```

```
    ],
    "tags" : {
      "createdby" : "ExampleName"
    },
    "properties" : {
      "computeCount" : 2,
      "displayName" : "ExampleName",
      "maintenanceWindow" : {
        "leadTimeInWeeks" : 0,
        "preference" : "NoPreference",
        "patchingMode" : "Rolling"
      },
      "shape" : "Exadata.X9M",
      "storageCount" : 3
    }
  })
  schema_validation_enabled = false
}

//-------------VMCluster resources ------------
// OperationId: CloudVmClusters_CreateOrUpdate, CloudVmClusters_Get,
CloudVmClusters_Delete
// PUT GET DELETE
/subscriptions/{subscriptionId}/resourceGroups/{resourceGroupName}/providers
/Oracle.Database/cloudVmClusters/{cloudvmclustername}
resource "azapi_resource" "cloudVmCluster" {
  type                      = "Oracle.Database/cloudVmClusters@2023-09-01-
preview"
  parent_id                 = azapi_resource.resourceGroup.id
  name                      = local.exa_cluster_name
  schema_validation_enabled = false
  depends_on                = [azapi_resource.cloudExadataInfrastructure]
  body                      = jsonencode({
    "properties": {
        "dataStorageSizeInTbs": 1000,
        "dbNodeStorageSizeInGbs": 1000,
        "memorySizeInGbs": 1000,
        "timeZone": "UTC",
        "hostname": "hostname1",
        "domain": "domain1",
        "cpuCoreCount": 2,
        "ocpuCount": 3,
        "clusterName": "cluster1",
        "dataStoragePercentage": 100,
        "isLocalBackupEnabled": false,
        "cloudExadataInfrastructureId": "/subscriptions/00000000-0000-0000-
0000-
000000000000/resourceGroups/rg000/providers/Oracle.Database/cloudExadataInfr
astructures/infra1",
        "isSparseDiskgroupEnabled": false,
        "sshPublicKeys": [
          "ssh-key 1"
        ],
        "nsgCidrs": [
          {
```

```
            "source": "10.0.0.0/16",
            "destinationPortRange": {
              "min": 1520,
              "max": 1522
            }
          },
          {
            "source": "10.10.0.0/24"
          }
        ],
        "licenseModel": "LicenseIncluded",
        "scanListenerPortTcp": 1050,
        "scanListenerPortTcpSsl": 1025,
        "vnetId": "/subscriptions/00000000-0000-0000-0000-
000000000000/resourceGroups/rg000/providers/Microsoft.Network/virtualNetwork
s/vnet1",
        "giVersion": "19.0.0.0",
        "subnetId": "/subscriptions/00000000-0000-0000-0000-
000000000000/resourceGroups/rg000/providers/Microsoft.Network/virtualNetwork
s/vnet1/subnets/subnet1",
        "backupSubnetCidr": "172.17.5.0/24",
        "dataCollectionOptions": {
          "isDiagnosticsEventsEnabled": false,
          "isHealthMonitoringEnabled": false,
          "isIncidentLogsEnabled": false
        },
        "displayName": "cluster 1",
        "dbServers": [
          "ocid1..aaaa"
        ]
      },
      "location": "eastus"
    }
})
  response_export_values = ["properties.ocid"]
}
```

List Oracle Exadata virtual machine clusters by subscription

```
data "azapi_resource" "subscription" {
  type                   = "Microsoft.Resources/subscriptions@2020-06-01"
  response_export_values = ["*"]
}

// OperationId: CloudExadataInfrastructures_ListBySubscription
// GET
/subscriptions/{subscriptionId}/providers/Oracle.Database/cloudExadataInfras
```

```
tructures
data "azapi_resource_list" "listCloudExadataInfrastructuresBySubscription" {
  type       = "Oracle.Database/cloudVmClusters@2023-09-01-preview"
  parent_id  = data.azapi_resource.subscription.id
}
```

List Oracle Exadata VM Clusters by Resource Group

```
data "azurerm_resource_group" "example" {
  name = "existing"
}

// OperationId: CloudExadataInfrastructures_ListByResourceGroup
// GET
/subscriptions/{subscriptionId}/resourceGroups/{resourceGroupName}/providers
/Oracle.Database/cloudExadataInfrastructures
data "azapi_resource_list" "listCloudExadataInfrastructuresByResourceGroup"
{
  type       = "Oracle.Database/cloudVmClusters@2023-09-01-preview"
  parent_id  = azurerm_resource_group.example.id
}
```

List Database Nodes on an Oracle Exadata VM Cluster

```
// OperationId: DbNodes_Get
// GET
/subscriptions/{subscriptionId}/resourceGroups/{resourceGroupName}/providers
/Oracle.Database/cloudVmClusters/{cloudvmclustername}/dbNodes/{dbnodeocid}
data "azapi_resource" "dbNode" {
  type      = "Oracle.Database/cloudVmClusters/dbNodes@2023-09-01-preview"
  parent_id = azapi_resource.cloudVmCluster.id. // VM Cluster Id
  name      = var.resource_name
}
```

Add a Virtual Network Address to an Oracle Exadata VM Cluster

```
// OperationId: VirtualNetworkAddresses_CreateOrUpdate,
VirtualNetworkAddresses_Get, VirtualNetworkAddresses_Delete
// PUT GET DELETE
/subscriptions/{subscriptionId}/resourceGroups/{resourceGroupName}/providers
/Oracle.Database/cloudVmClusters/{cloudvmclustername}/virtualNetworkAddresse
s/{virtualnetworkaddressname}
resource "azapi_resource" "virtualNetworkAddress" {
  type                      =
"Oracle.Database/cloudVmClusters/virtualNetworkAddresses@2023-09-01-preview"
  parent_id                 = azapi_resource.cloudVmCluster.id
  name                      = var.resource_name
  body = jsonencode({
    "properties": {
        "ipAddress": "192.168.0.1",
        "vmOcid": "ocid1..aaaa"
      }
  })
  schema_validation_enabled = false
}
```

List Virtual Network Addresses on an Oracle Exadata VM Cluster

```
// OperationId: VirtualNetworkAddresses_ListByCloudVmCluster
// GET
/subscriptions/{subscriptionId}/resourceGroups/{resourceGroupName}/providers
/Oracle.Database/cloudVmClusters/{cloudvmclustername}/virtualNetworkAddresse
s
data "azapi_resource_list" "listVirtualNetworkAddressesByCloudVmCluster" {
  type       =
"Oracle.Database/cloudVmClusters/virtualNetworkAddresses@2023-09-01-preview"
  parent_id  = azapi_resource.cloudVmCluster.id
}
```

List an Oracle Exadata Database shape

```
data "azapi_resource_id" "location" {
  type      = "Oracle.Database/locations@2023-12-12"
  parent_id = data.azapi_resource.subscription.id
```

```
  name      = "eastus"
}

// OperationId: DbSystemShapes_Get
// GET
/subscriptions/{subscriptionId}/providers/Oracle.Database/locations/{locatio
n}/dbSystemShapes/{dbsystemshapename}
data "azapi_resource" "dbSystemShape" {
  type      = "Oracle.Database/locations/dbSystemShapes@2023-09-01-preview"
  parent_id = data.azapi_resource_id.location.id
  name      = var.resource_name
}
```

List Oracle Exadata Database Shapes by location

```
// OperationId: DbSystemShapes_ListByLocation
// GET
/subscriptions/{subscriptionId}/providers/Oracle.Database/locations/{locatio
n}/dbSystemShapes
data "azapi_resource_list" "listDbSystemShapesByLocation" {
  type       = "Oracle.Database/locations/dbSystemShapes@2023-09-01-preview"
  parent_id  = data.azapi_resource_id.location.id
}
```

Terraform script to test the examples

> **Note**
>
> The following script creates an Oracle Exadata Infrastructure and an Oracle Exadata VM Cluster using the AzAPI Terraform provider followed by creating an Oracle Database deployment using the OCI Terraform provider https://registry.terraform.io/providers/oracle/oci/latest/docs/resources/database_db_home.

```
terraform {
  required_providers {
    azapi = {
```

```
      source = "Azure/azapi"
    }
    oci = {
      source = "oracle/oci"
    }
  }
}

provider "azapi" {
  skip_provider_registration = false
}

provider "oci" {
  user_ocid        = <user_ocid>
  fingerprint      = <user_fingerprint>
  tenancy_ocid     = <oci_tenancy_ocid>
  region           = "us-ashburn-1"
  private_key_path = <Path to API Key>
}

locals {
  resource_group_name = "TestResourceGroup"
  user                = "Username"
  location            = "eastus"
}

resource "azapi_resource" "resource_group" {
  type     = "Microsoft.Resources/resourceGroups@2023-07-01"
  name     = local.resource_group_name
  location = local.location
}

resource "azapi_resource" "virtual_network" {
  type      = "Microsoft.Network/virtualNetworks@2023-04-01"
  name      = "${local.resource_group_name}_vnet"
  location  = local.location
  parent_id = azapi_resource.resource_group.id
  body = jsonencode({
    properties = {
      addressSpace = {
        addressPrefixes = [
          "10.0.0.0/16"
        ]
      }
      subnets = [
        {
          name = "delegated"
          properties = {
            addressPrefix = "10.0.1.0/24"
            delegations = [
              {
                name = "Oracle.Database.networkAttachments"
                properties = {
                  serviceName = "Oracle.Database/networkAttachments"
                }
```

```
              }
            ]
          }
        }
      ]
    }
  })
}

data "azapi_resource_list" "listVirtualNetwork" {
  type                   = "Microsoft.Network/virtualNetworks/subnets@2023-
09-01"
  parent_id              = azapi_resource.virtual_network.id
  depends_on             = [azapi_resource.virtual_network]
  response_export_values = ["*"]
}

resource "tls_private_key" "generated_ssh_key" {
  algorithm = "RSA"
  rsa_bits  = 4096
}

resource "azapi_resource" "ssh_public_key" {
  type      = "Microsoft.Compute/sshPublicKeys@2023-09-01"
  name      = "${local.resource_group_name}_key"
  location  = local.location
  parent_id = azapi_resource.resource_group.id
  body = jsonencode({
    properties = {
      publicKey = "${tls_private_key.generated_ssh_key.public_key_openssh}"
    }
  })
}

// OperationId: CloudExadataInfrastructures_CreateOrUpdate,
CloudExadataInfrastructures_Get, CloudExadataInfrastructures_Delete
// PUT
/subscriptions/{subscriptionId}/resourceGroups/{resourceGroupName}/providers
/Oracle.Database/cloudExadataInfrastructures/{cloudexadatainfrastructurename
}
resource "azapi_resource" "cloudExadataInfrastructure" {
  type      = "Oracle.Database/cloudExadataInfrastructures@2023-09-01-
preview"
  parent_id = azapi_resource.resource_group.id
  name      = "OFake_terraform_deploy_infra_${local.resource_group_name}"
  timeouts {
    create = "1h30m"
    delete = "20m"
  }
  body = jsonencode({
    "location" : "${local.location}",
    "zones" : [
      "2"
    ],
    "tags" : {
```

```
      "createdby" : "${local.user}"
    },
    "properties" : {
      "computeCount" : 2,
      "displayName" :
"OFake_terraform_deploy_infra_${local.resource_group_name}",
      "maintenanceWindow" : {
        "leadTimeInWeeks" : 0,
        "preference" : "NoPreference",
        "patchingMode" : "Rolling"
      },
      "shape" : "Exadata.X9M",
      "storageCount" : 3
    }

  })
  schema_validation_enabled = false
}

// OperationId: DbServers_ListByCloudExadataInfrastructure
// GET
/subscriptions/{subscriptionId}/resourceGroups/{resourceGroupName}/providers
/Oracle.Database/cloudExadataInfrastructures/{cloudexadatainfrastructurename
}/dbServers
data "azapi_resource_list" "listDbServersByCloudExadataInfrastructure" {
  type                   =
"Oracle.Database/cloudExadataInfrastructures/dbServers@2023-09-01-preview"
  parent_id              = azapi_resource.cloudExadataInfrastructure.id
  depends_on             = [azapi_resource.cloudExadataInfrastructure]
  response_export_values = ["*"]
}

// OperationId: CloudVmClusters_CreateOrUpdate, CloudVmClusters_Get,
CloudVmClusters_Delete
// PUT
/subscriptions/{subscriptionId}/resourceGroups/{resourceGroupName}/providers
/Oracle.Database/cloudVmClusters/{cloudvmclustername}
resource "azapi_resource" "cloudVmCluster" {
  type                      = "Oracle.Database/cloudVmClusters@2023-09-01-
preview"
  parent_id                 = azapi_resource.resource_group.id
  name                      =
"OFake_terraform_deploy_cluster_${local.resource_group_name}"
  schema_validation_enabled = false
  depends_on                = [azapi_resource.cloudExadataInfrastructure]
  timeouts {
    create = "1h30m"
    delete = "20m"
  }
  body = jsonencode({
    "location" : "${local.location}",
    "tags" : {
      "createdby" : "${local.user}"
    },
    "properties" : {
```

```
      "subnetId" :
"${jsondecode(data.azapi_resource_list.listVirtualNetwork.output).value[0].i
d}"
      "cloudExadataInfrastructureId" :
"${azapi_resource.cloudExadataInfrastructure.id}"
      "cpuCoreCount" : 4
      "dataCollectionOptions" : {
        "isDiagnosticsEventsEnabled" : true,
        "isHealthMonitoringEnabled" : true,
        "isIncidentLogsEnabled" : true
      },
      "dataStoragePercentage" : 80,
      "dataStorageSizeInTbs" : 2,
      "dbNodeStorageSizeInGbs" : 120,
      "dbServers" : [

"${jsondecode(data.azapi_resource_list.listDbServersByCloudExadataInfrastruc
ture.output).value[0].properties.ocid}",

"${jsondecode(data.azapi_resource_list.listDbServersByCloudExadataInfrastruc
ture.output).value[1].properties.ocid}"
      ]
      "displayName" :
"OFake_terraform_deploy_cluster_${local.resource_group_name}",
      "giVersion" : "19.0.0.0",
      "hostname" : "${local.user}",
      "isLocalBackupEnabled" : false,
      "isSparseDiskgroupEnabled" : false,
      "licenseModel" : "LicenseIncluded",
      "memorySizeInGbs" : 60,
      "sshPublicKeys" :
["${tls_private_key.generated_ssh_key.public_key_openssh}"],
      "timeZone" : "UTC",
      "vnetId" : "${azapi_resource.virtual_network.id}",
      "provisioningState" : "Succeeded"
    }
  })
  response_export_values = ["properties.ocid"]
}

resource "oci_database_db_home" "exa_db_home" {
  source        = "VM_CLUSTER_NEW"
  vm_cluster_id =
jsondecode(azapi_resource.cloudVmCluster.output).properties.ocid
  db_version    = "19.20.0.0"
  display_name  = "TFDBHOME"

  database {
    db_name        = "TFCDB"
    pdb_name       = "TFPDB"
    admin_password = "TestPass#2024#"
    db_workload    = "OLTP"
  }
  depends_on = [azapi_resource.cloudVmCluster]
}
```

Manage resources for Oracle Database@Azure

Article • 06/11/2024

After you provision an OracleDB@Azure resource, for example an Oracle Exadata Infrastructure or an Oracle Exadata VM Cluster, you can use the Microsoft Azure blade for a limited set of management functions. That limited set of management functions is described in this document.

Common management functions from the Microsoft Azure Blade

The following management functions are available for all resources from the Microsoft Azure blade for that resource.

- **Access the resource blade**.

    1. From the Microsoft Azure portal, select OracleDB@Azure application.
    2. From the left menu, select the resource type. For example, select **Oracle Exadata Database@Azure** or **Oracle Autonomous Database@Azure**.
    3. If the blade lists and manages several resources, select the resource type at the top of the blade. For example, the **Oracle Exadata Database@Azure** blade accesses both Oracle Exadata Infrastructure and Oracle Exadata VM Cluster resources.

- **List and see the status for all the resources of the same type.**

    1. Follow the steps to access the resource blade.
    2. Resources are shown in the list as **Succeeded**, **Failed**, or **Provisioning**.
    3. Access the specifics of that resource by selecting the link in the **Name** field in the table.

- **Provision a new resource of the same type.**

    1. Follow the steps to access the resource blade.
    2. Select the **+ Create** icon at the top of the blade.
    3. Follow the provisioning flow for the resource.

- **Refresh the blade's info to see recent changes to the resource.**

    1. Follow the steps to access the resource blade.

2. Select the **Refresh** icon at the top of the blade.
3. Wait for the blade to reload.

- **Remove the resource.**

    1. Follow the steps to access the resource blade.
    2. You can remove a single or multiple resources from the blade by selecting the checkbox on the left side of the table. Once you have selected the resource(s) to remove, you can then select the **Delete** icon at the top of the blade.
    3. You can also remove a single resource by selecting the link to the resource from the **Name** field in the table. From the resource's detail page, select the **Delete** icon at the top of the blade.

- **Move the resource to a new resource group.**

    1. Follow the steps to access the resource blade.
    2. Select the link to the resource from the **Name** field in the table.
    3. From the resource's overview page, select the **Move** link on the Resource group field.
    4. From the **Move resources** page, use the drop-down field for **Resource group** to select an existing resource group.
    5. To create and use a new resource group, select the **Create new** link below the Resource group field. Enter a new resource group name in the **Name** field. Select the **OK** button to save your new resource group and use it. Select the **Cancel** button to return without creating a new resource group.

- **Move the resource to a new subscription.**

    > ⓘ **Note**
    >
    > You must have access to another Microsoft Azure subscription, and that subscription must have been setup for access to OracleDB@Azure. If both of these conditions are not met, you will not be able to successfully move the resource to another subscription.

    1. Follow the steps to access the resource blade.
    2. Select the link to the resource from the Name field in the table.
    3. From the resource's overview page, select the **Move** link on the Subscription field.
    4. From the **Move resources** page, use the drop-down field for **Subscription** to select an existing subscription.

5. You can also simultaneously move the resource group for the resource. To do this, note the steps in the **Move the resource to a new resource group** tasks.
Add, manage, or delete tags for the resource.
6. Follow the steps to access the resource blade.
7. Select the link to the resource from the Name field in the table.
8. From the resource's overview page, select the **Edit** link on the **Tags** field.
9. To create a new tag, enter values in the **Name** and **Value** fields.
10. To edit an existing tag, change the value in the existing tag's **Value** field.
11. To delete an existing tag, select the **Trashcan** icon at the right-side of the tag.

Manage resource allocation for Oracle Autonomous Database Serverless instances

The following management functions are available for Oracle Autonomous Database Serverless instances from the Microsoft Azure blade for that resource.

> ⓘ **Note**
>
> You can only change the resource allocation settings for Oracle Autonomous Database Serverless instances using these steps. This does not apply to any other resource type.

Follow the following steps to access the Oracle Autonomous Database@Azure blade.

1. Select the link to the resource from the **Name** field in the table.
2. From the resource's overview page, select the **Setting** link left-menu, and then the **Resource allocation** link.
3. Select the **Manage** button at the top of the Resource allocation page.
4. From the **Manage resource allocation** window, you can set the **ECPU count** from 2 to 512. The **Compute auto scaling** checkbox allows you to enable your Oracle Autonomous Database to scale its computing allocation automatically up to 512. The **Storage** is a slider UI that allows setting the Storage allocation from 1 TB to 384 TB. The **Storage auto scaling** checkbox allows you to enable your Oracle Autonomous Database to scale its storage allocation automatically up to 384 TB.
5. After you have set or reviewed the fields, select the **Apply** or **Cancel** button as appropriate.

- **Use the OCI console for complete management of the resource.**

    1. Follow the steps to access the resource blade.
    2. Select the link to the resource from the **Name** field in the table.

3. From the resource's detail page, select the **Go to OCI** link on the **OCI Database URL** field.
4. Log in to OCI.
5. Manage the resource from within the OCI console.

Troubleshoot provisioning issues

Article • 06/11/2024

This article describes how to resolve common errors and provisioning issues in your Oracle Database@Azure environments.

The issues covered in this article do not cover general issues related to Oracle Database@Azure configuration, settings, and account setup. For more information on those topics, see Oracle Database@Azure Overview.

Terminations and Microsoft Azure Locks

Oracle advises removal of all Microsoft Azure locks to Oracle Database@Azure resources before terminating the resource. For example, if you created a Microsoft Azure private endpoint, you should remove that resource first. If you have a policy to prevent the deletion of locked resources, the Oracle Database@Azure workflow to delete the resource will fail because Oracle Database@Azure cannot delete the lock.

IP Address Requirement Differences

There are IP address requirement differences between Oracle Database@Azure and Oracle Cloud Infrastructure (OCI). In the Requirements for IP Address Space documentation, the following changes for Oracle Database@Azure must be considered.

- Oracle Database@Azure only supports Exadata X9M. All other shapes are unsupported.
- Oracle Database@Azure reserves 13 IP addresses for the client subnet versus 3 for OCI requirements.

Link Oracle Database@Azure to multiple Azure subscriptions

Article • 08/02/2024

Learn about how to link Oracle Database@Azure to multiple Azure subscriptions.

You can use Oracle Database@Azure within two or more Azure subscriptions within a single Azure account. This feature gives you the ability to isolate projects, environments, and application domains for security and cost allocation, while maintaining a single Azure account for simplified billing and account management. When using two or more Azure subscriptions with Oracle Database@Azure, all Azure subscriptions are linked to the OCI tenancy used for service onboarding.

Prerequisites

- You must onboard with Oracle Database@Azure before you can link Azure subscriptions to the service as described in this article. For more information, see Onboarding with Oracle Database@Azure and Prerequisites for Oracle Database@Azure for more information.
- Add the `Oracle.Database` resource provider to the subscription you're adding to the service. To add the subscription, navigate to the Azure subscription details page, then select Resource providers under Settings. Select `Oracle.Database` in the list of providers, then select **Register**.
- Add the `Microsoft.BareMetal`, `Microsoft.Network`, and `Microsoft.Compute` resources providers to the subscription you're adding to the service. Add these resources from the Azure subscription details page, as you added the `Oracle.Database` resource provider described in the preceding prerequisite.

> **Note**
>
> You can't provision Oracle Database@Azure resources until these Azure resource providers are registered for the subscription you're adding.

How multiple Azure subscriptions work in Oracle Database@Azure

During Oracle Database@Azure onboarding, you select an Azure subscription to use initially with the service. In this documentation, the subscription selected during onboarding is referred to as the primary subscription for Oracle Database@Azure. After onboarding is complete and your Azure account is linked to your OCI tenancy, the OCI tenancy has a new, automatically created compartment for the management of the service.

When you add more Azure subscriptions to your Oracle Database@Azure service, the service automatically creates a child compartment within the main Oracle Database@Azure compartment created during onboarding. You don't have to do any manual configuration of your OCI tenancy to add more Azure subscriptions to the service.

> **Important**
>
> When adding Azure subscriptions to your Oracle Database@Azure service, the new subscriptions must use the same billing account as the primary Azure subscription selected during service onboarding.

After you add a new Azure subscription to the Oracle Database@Azure service, you can begin provisioning database resources in that subscription. For database systems with more than one component (for example, Exadata systems with an infrastructure resource and a VM cluster resource), all components must be provisioned within the same subscription. When users are working within an Azure subscription, they only see the Oracle Database@Azure resources provisioned within that subscription. Database resources provisioned in other subscriptions aren't visible to the user.

Add an Azure subscription to the Oracle Database@Azure service

1. Sign in to the Azure portal and navigate to the details page of your primary Oracle Database@Azure subscription (this is the subscription selected during onboarding). For more information, see Filter and view subscriptions in the Azure documentation for details. If you don't know the name of the subscription, ask your Azure account administrator.
2. On the details page for your Oracle subscription, select **Add subscriptions**.
3. In the **Add Azure Subscriptions** panel, select one or more subscriptions to add to your service using the **Azure Subscriptions** selector, then select **Add**.
4. On the details page of the primary Oracle Database@Azure, you can see the number of active subscriptions for the service under **Account management**. When

the subscriptions you added are ready for use, you see a **Validated** message in the **Account management** section.

Feedback

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Oracle Database@Azure support information

Article • 03/07/2024

In this article, you learn how to get information and support for Oracle Database@Azure.

Oracle Support scope and contact information

Oracle Support is your first line of support for all Oracle Database@Azure issues. Oracle Support can help you with the following types of Oracle Database@Azure issues:

- Database connection issues (Oracle TNS)
- Oracle Database performance issues
- Oracle Database error resolution
- Networking issues related to communications with the OCI tenancy associated with the service
- Quota (limits) increases to receive more capacity
- Scaling to add more compute and storage capacity to Oracle Database@Azure
- New generation hardware upgrades
- Billing issues related to Oracle Database@Azure

If you contact Oracle Support, be sure to tell your Oracle Support agent that your issue is related to Oracle Database@Azure. Support requests for this service are handled by a support team that specializes in these deployments. A member of this specialized team contacts you directly.

1. Call **1-800-223-1711.** If you're outside of the United States, visit Oracle Support Contacts Global Directory to find contact information for your country or region.
2. Choose option "2" to open a new Service Request (SR).
3. Choose option "4" for "unsure".
4. Enter "#" each time you're asked for your CSI number. At the third attempt, your call is directed to an Oracle Support agent.
5. Let the agent know that you have an issue with your multicloud system, and the name of the product (for example, or). An internal Service Request is opened on your behalf and a support engineer contacts you directly.

You can also submit a question to the Oracle Database@Azure forum in Oracle's Cloud Customer Connect community. This option is available to all customers.

Azure Support scope and contact information

Azure provides support for the following, collaborating with OCI as needed:

- Virtual networking issues including those involving network address translation (NAT), firewalls, DNS and traffic management, and delegated Azure subnets.
- Bastion and virtual machine (VM) issues including database host connection, software installation, latency, and host performance.
- VM metrics, database logs, database events.

See Contact Microsoft Azure Support in the Azure documentation for information on Azure support. For SLA information about the service offering, please refer to the Oracle PaaS and IaaS Public Cloud Services Pillar Document

Next steps

- Overview - Oracle Database@Azure
- Onboard with Oracle Database@Azure
- Provision and manage Oracle Database@Azure
- Network planning for Oracle Database@Azure
- Groups and roles for Oracle Database@Azure

Oracle Database@Azure FAQs

Article • 08/02/2024

This article answers frequently asked questions (FAQs) about the Oracle Database@Azure partnership with Microsoft.

General

In this section, we cover general questions about Oracle Database@Azure.

How does Oracle Database@Azure work?

Oracle Database@Azure is enabled by hosting OCI's infrastructure in Azure and natively integrated with Azure offering low-latency, high-bandwidth connectivity from your mission critical database tier to your application tier and rest of services in Azure. Enterprise critical features like RAC, Data Guard, Golden Gate, managed backups, self-managed RMAN backups, Zero Downtime Migration, on-premises connectivity, and seamless integration with other Azure services are supported. For more information, see Overview - Oracle Database@Azure | Microsoft Learn.

How is Oracle Database@Azure different from OCI Interconnect and Oracle on Azure VMs?

- Oracle Database@Azure: Oracle Database@Azure (Oracle Database Service for Azure) is hosted on OCI's infrastructure in Azure datacenters enabling you to host your mission critical Oracle databases closer to your application tier hosted in Azure. Azure virtual network integration with subnet delegation enables private IPs from customer virtual network to serve as database endpoints. This solution is Oracle managed and supported service in Azure.

- Oracle on Azure VMs: You can also deploy and self-manage your Oracle workloads on Azure VMs. Specifically, workloads that don't require features like RAC, Smart Scan or Exadata, performance are best suited for this operation.

- OCI Interconnect: OCI interconnect is used to connect your Oracle deployments in OCI with Applications and services in Azure over OCI FastConnect and Azure ExpressRoute. This typically suits workloads/solutions that can work with the high latency envelope, have dependency on services, features, and functionalities running in both clouds.

Is Oracle Database@Azure available on dedicated infrastructure or is it only available as a shared service? What is the isolation level?

There are two services offered as part of Oracle Database@Azure:

- Oracle Exadata Database Service on Dedicated Infrastructure runs on Dedicated Exadata infrastructure in Azure. You get dedicated Oracle CPUs (OCPUs) and storage, with isolation being at the node level.
- Oracle Autonomous Database Serverless is the other Oracle Database service offered at Azure and is on shared Exadata infrastructure.

What are the Database versions supported on Oracle Database@Azure?

Oracle versions supported on Oracle Cloud Infrastructure (OCI) are supported on Oracle Database@Azure. This includes 11 g to 19c, similar to Exadata Cloud Service in OCI. Versions older than 19c need upgrade support. For more information, see Oracle Database Releases That Support Direct Upgrade.

Do you have any documented benchmark latency-wise between Azure resources and Oracle Database@Azure?

Latency between Azure resources and Oracle Database@Azure is within the Azure regional latency envelope as the Exadata infrastructure is within the Azure Data Centers. Latency can be further fine-tuned dependent on Co-Location within Availability Zones.

Does Oracle Database@Azure support deploying Base Database (BD), or do I need to migrate to Autonomous Database service?

No, Base Database isn't currently supported with Oracle Database@Azure. You can deploy single instance self-managed databases on Azure VMs or if you need Oracle managed databases with RAC, we recommend Autonomous Databases via Oracle Database@Azure. For more information, see Autonomous Database | Oracle and Provision Oracle Autonomous Databases | Microsoft Learn.

For the Oracle Database@Azure service, will the automated DBCS DR use Azure backbone or the OCI backbone?

BCDR is enabled using the OCI managed offering (Backup and Data Guard) and will use the Azure-OCI backbone.

How many database servers can be deployed in each rack of Oracle Database@Azure? Is there flexibility in terms of being able to scale up and down as needed from both the consumption and licensing perspective?

Oracle Database@Azure currently runs on X9M hardware and provides a configuration of a minimum of two database servers and three Storage servers. This constitutes a quarter rack configuration. This configuration can be increased to a limit of 32 database servers and 64 Storage servers. You can scale up and down as needed within the Exadata system depending on your SKU. For more information about configurations, see Oracle Exadata Database Service on Dedicated Infrastructure Description. For more specifics, see Oracle Exadata Cloud Infrastructure X9M Data Sheet.

What Oracle applications are supported to run on Azure?

Various Oracle applications are authorized and supported to be run on Azure. For more information, see Oracle programs are eligible for Authorized Cloud Environments.

What are the available Service Level Agreements (SLAs)?

For detailed Service Level Agreements, refer to the Oracle PaaS and IaaS Public Cloud Services Pillar Document.

Billing and Commerce

In this section, we cover questions related to billing and commerce for Oracle Database@Azure.

How much will Oracle Database@Azure cost?

Oracle Database@Azure is at parity with the Exadata Cloud costs in OCI. For list prices, refer to OCI's Cloud Cost Estimator (oracle.com). For your specific costs tailored to your

needs, work with your Oracle sales team.

Is Oracle Database@Azure eligible for MACC (Microsoft Azure Commit to Consume)?

Yes, the Oracle Database@Azure offering is Azure benefits eligible and hence eligible for MACC decrement.

What licensing options are available to deploy Oracle Databases with Oracle Database@Azure.

You can Bring Your Own License (BYOL) or provision License included Oracle databases with Oracle Database@Azure.

Can we utilize multi-tenancy billing ID across different regions?

The billing account ID used to target the private offer to a specific customer doesn't constrain where the service can be deployed.

Can I procure Oracle Database@Azure even if the service isn't available in my region?

You can purchase the Oracle Database@Azure anytime as it's Generally Available in multiple regions. However, you can only deploy the service in the region of your choice once it's live.

For the Oracle Database@Azure service, will the automated DBCS DR incur charges from Azure?

BCDR using the OCI managed offering (Backup and Data Guard) won't incur any more charges from Azure.

Does ingress/egress incur any charges for the Oracle Database@Azure service?

Ingress and Egress for managed services is via Azure OCI backbone and doesn't incur charges. Virtual network traffic is charged at the current price.

Onboarding, Provisioning, and Migration

In this section, we'll cover questions related to onboarding, provisioning, and migration to Oracle Database@Azure.

To set up Oracle Database@Azure, what would be the role assignments needed for the Azure user?

You can find the list of role assignments here.

Can you describe the authentication/authorization standards supported by Oracle Database@Azure?

Oracle Database@Azure is based on SAML and OpenID standards. OCI Oracle Identity and Access Management (IAM) can be federated with Microsoft Entra ID, or other customer used identity providers for OCI Console access for Oracle Database Users.

Where can I find best practices to plan and deploy Oracle Database@Azure?

Refer to our landing zone architecture documentation to plan and deploy your oracle workloads with Oracle Database@Azure here.

Does Azure have any tools to assist with understanding Oracle database sizing, license usage and TCO for both Oracle Database@Azure and Oracle IaaS?

For Oracle Database@Azure, the sizing is managed by Oracle. Contact your Oracle representative for sizing.

For Oracle Database on Azure VMs, we currently have the Oracle Migration Assistance Tool (OMAT). Contact your Microsoft representative for more information.

What tools can be used for database migration? Could you help share other details about licensing and charges for these tools?

There are multiple tools available from Oracle: ZDM, Data Guard, Data pump, GoldenGate, and more. For more information, contact your Oracle representative for

commercials.

When using Oracle GoldenGate for migration, do I need to purchase a GoldenGate license?

Yes, and it isn't included in the private offer. Discuss with your Oracle representative on how to enable this service in addition to Oracle Database@Azure.

Networking

In this section, we cover questions related to networking for Oracle Database@Azure.

What network patterns and network features are supported with Oracle Database@Azure?

We support a comprehensive list of connectivity patterns and network features with Oracle Database@Azure and the list evolves as we're continuously releasing new features and capabilities. For more information, see Network planning for Oracle Database@Azure | Microsoft Learn.

How does Data Guard traffic between Availability Zones in the same region work?

Data Guard network path can be configured while setting it up. For cross zone Data Guard traffic, you have an option to configure the traffic to traverse only the Azure backbone. For cross region traffic however, it must traverse through Azure and OCI network backbone.

What is the latency impact of using OCI connections?

None. The OCI connection is primarily utilized for OCI control plane to manage the service and so there's no impact to your Application to DB latencies or any data plane latencies.

How do I achieve low latencies between my application and Database tiers?

You can deploy your application and database in the same virtual network or a peered VNETs in the same region and availability zone for lowest possible latencies.

Management

In this section, we cover questions related to management for Oracle Database@Azure.

Who manages and hosts the data in this partnership with Oracle?

Oracle will manage and host the data on Oracle Cloud Infrastructure hosted in Azure datacenters. Your data reside within the provisioned Oracle Exadata infrastructure in Azure, and within the Azure Virtual Network boundary.

In case you enable backup to Azure, that data reside in the respective Azure storage – Azure NetApp Files, Blob storage.

We ensure compliance with both companies' data privacy and compliance policies through physical isolation of systems within Azure datacenters and access enforced assignment policies. For more information on compliance, refer to Overview - Oracle Database@Azure | Microsoft Learn or Oracle compliance website.

How is data security managed? Is the data encrypted in transit and at rest?

Data is encrypted at rest. All traffic between sites, including Oracle Database@Azure infrastructure, is encrypted.

Can Azure Monitor be used to along with Oracle Database@Azure?

Yes, Metrics are published for Exadata Infra, VM cluster and Oracle databases. The database metrics are folded under VM metrics. Custom dashboards can be created on Azure Monitor along with your application monitoring for a unified view.

What are the different options for backup on Oracle Database@Azure?

Automated / managed backups to OCI object storage and self-managed backups using RMAN to Azure NetApp Files (ANF).

Is there a way to connect to SAN storage and will this connection be supported?

Oracle Database@Azure service provides customers with dedicated Exadata compute and storage within the Exadata Infrastructure. For other storage options, Azure NetApp Files volumes can be attached to the VMs on the VM clusters.

Will we be able to use Azure HSM, or external HSM to encrypt databases? How would customer managed database keys work?

You can manage keys with Oracle Key Vault. Integration with Azure offerings like HSM and Sentinel are on the roadmap.

What type of storage redundancy options are available?

Oracle ASM is the default and only storage management system supported on Exadata systems. Only NORMAL (protection against single disk or an entire storage server failure) and HIGH redundancy (protection against two simultaneous partner disk failures from two distinct storage servers) levels are supported on Exadata systems. For more information, see Oracle ASM Considerations for Exadata Deployments: On-premises and Cloud.

Is tiering storage available for the database within Oracle Database@Azure?

Tiering storage service is available as part of Oracle Database@Azure. The Exadata storage servers provide three levels of tiering--PMem, NVME Flash, and HDD. Compression and partitioning are recommended as part of a storage tiering design. For more information, see Oracle Exadata Cloud Infrastructure X9M Data Sheet.

Where can I go to get more information about capabilities and features corresponding to Oracle Database@Azure?

For more information about Oracle Database@Azure, see the following resources.

- Overview - Oracle Database@Azure
- Provision and manage Oracle Database@Azure

- Oracle Database@Azure support information
- Network planning for Oracle Database@Azure
- Groups and roles for Oracle Database@Azure

Next steps

- Overview - Oracle Database@Azure
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