



# **Deployment procedures**

## **NetApp Solutions**

NetApp  
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# Step-by-Step Oracle deployment procedures on Azure VM and Azure NetApp Files

[Previous: Factors to consider.](#)

## Deploy an Azure VM with ANF for Oracle via Azure portal console

If you are new to Azure, you first need to set up an Azure account environment. This includes signing up your organization to use Azure Active Directory. The following section is a summary of these steps. For details, see the linked Azure-specific documentation.

### Create and consume Azure resources

After your Azure environment is set up and an account is created and associated with a subscription, you can log into Azure portal with the account to create the necessary resources to run Oracle.

#### 1. Create a virtual network or VNet

Azure Virtual Network (VNet) is the fundamental building block for your private network in Azure. VNet enables many types of Azure resources, such as Azure Virtual Machines (VMs), to securely communicate with each other, the internet, and on-premises networks. Before provisioning an Azure VM, a VNet (where a VM is deployed) must first be configured.

See [Create a virtual network using the Azure portal](#) to create a VNet.

#### 2. Create a NetApp storage account and capacity pool for ANF

In this deployment scenario, an Azure VM OS is provisioned using regular Azure storage, but ANF volumes are provisioned to run Oracle database via NFS. First, you need to create a NetApp storage account and a capacity pool to host the storage volumes.

See [Set up Azure NetApp Files and create an NFS volume](#) to set up an ANF capacity pool.

#### 3. Provision Azure VM for Oracle

Based on your workload, determine what type of Azure VM you need and the size of the VM vCPU and RAM to deploy for Oracle. Then, from the Azure console, click the VM icon to launch the VM deployment workflow.

1. From the Azure VM page, click **Create** and then choose **Azure virtual machine**.

Microsoft Azure									
Search resources, services, and docs (G+)									
Home >									
Virtual machines									
Hybrid Cloud TME									
<a href="#">Create</a> <a href="#">Switch to classic</a> <a href="#">Reservations</a> <a href="#">Manage view</a> <a href="#">Refresh</a> <a href="#">Export to CSV</a> <a href="#">Open query</a> <a href="#">Assign tags</a> <a href="#">Start</a> <a href="#">Restart</a> <a href="#">Stop</a> <a href="#">Delete</a> <a href="#">Services</a> <a href="#">Maintenance</a>									
Filter for any field...           Subscription equals all           Type equals all           Resource group equals all           Location equals all           Add filter									
No grouping           List view									
<input type="checkbox"/> Name ↑	Type ↑	Subscription ↑	Resource group ↑	Location ↑	Status ↑	Operating system ↑	Size ↑	Public IP address ↑	Disks ↑
<input type="checkbox"/> acao-ora01	Virtual machine	Hybrid Cloud TME Onprem	TMEtstres	South Central US	Stopped (deallocated)	Linux	Standard_B4ms	13.65.63.157	1
<input type="checkbox"/> ANFAVFa2JH	Virtual machine	Hybrid Cloud TME Onprem	ANFAVSVAL2	West Europe	Running	Windows	Standard_DS2_v2	20.229.80.88	1
<input type="checkbox"/> ANFAVSfo01	Virtual machine	Hybrid Cloud TME Onprem	anfavsrq	South Central US	Stopped (deallocated)	Linux	Standard_DS2ds_v4	-	1
<input type="checkbox"/> ANFAVSfoAZ1	Virtual machine	Hybrid Cloud TME Onprem	anfavsrq	South Central US	Running	Linux	Standard_E32as_v4	40.124.74.246	1
<input type="checkbox"/> ANFAVSfoAZ2	Virtual machine	Hybrid Cloud TME Onprem	anfavsrq	South Central US	Stopped (deallocated)	Linux	Standard_E32as_v4	40.124.178.111	1
<input type="checkbox"/> ANFAVSfoAZ3	Virtual machine	Hybrid Cloud TME Onprem	anfavsrq	South Central US	Stopped (deallocated)	Linux	Standard_E32as_v4	40.124.194.32	1
<input type="checkbox"/> ANFAVSvalDC	Virtual machine	Hybrid Cloud TME Onprem	anfavsrq	South Central US	Stopped (deallocated)	Windows	Standard_B4ms	-	1
<input type="checkbox"/> ANFAVSvalIH	Virtual machine	Hybrid Cloud TME Onprem	anfavsrq	South Central US	Running	Windows	Standard_B2ms	70.37.66.218	1
<input type="checkbox"/> ANFAVSvalIH2	Virtual machine	Hybrid Cloud TME Onprem	anfavsrq	South Central US	Running	Windows	Standard_B2s	20.225.210.195	1
<input type="checkbox"/> ANFCVOCM	Virtual machine	Hybrid Cloud TME Onprem	anfavsva2	West Europe	Running	Linux	Standard_DS3_v2	-	1
<input type="checkbox"/> ANFCVOORDC2	Virtual machine	Hybrid Cloud TME Onprem	anfavsva2	West Europe	Running	Windows	Standard_B2s	-	1
<input type="checkbox"/> ANFCVOORDemo	Virtual machine	Hybrid Cloud TME Onprem	anfcvodrdemo-rg	West Europe	Running	Linux	Standard_E4s_v3	-	5
<input type="checkbox"/> AVSCVOPerfinguest	Virtual machine	Hybrid Cloud TME Onprem	avscvoperfinguest-rg	West Europe	Stopped (deallocated)	Linux	Standard_DS15_v2	-	5

- Choose the subscription ID for the deployment, and then choose the resource group, region, host name, VM image, size, and authentication method. Go to the Disk page.

[Home](#) > [Virtual machines](#) >

# Create a virtual machine ...

[Basics](#) [Disks](#) [Networking](#) [Management](#) [Advanced](#) [Tags](#) [Review + create](#)

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. [Learn more](#)

## Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription \*

Hybrid Cloud TME Onprem



Resource group \*

ANFAVSRG

[Create new](#)

## Instance details

Virtual machine name \*

acao-ora01

Region \*

(US) South Central US

Availability options

No infrastructure redundancy required

Security type

Standard

Image \*

Red Hat Enterprise Linux 8.0 (LVM) - Gen2

[See all images](#) | [Configure VM generation](#)

Run with Azure Spot discount

☐

Size \*

Standard\_D8s\_v3 - 8 vcpus, 32 GiB memory (\$273.02/month)

[See all sizes](#)

## Administrator account

Authentication type

- ☐ SSH public key
- ☒ Password

[Review + create](#)

&lt; Previous

Next : Disks &gt;

## Create a virtual machine ...

Size \* ⓘ

Standard\_D8s\_v3 - 8 vcpus, 32 GiB memory (\$273.02/month) ▼

[See all sizes](#)

### Administrator account

Authentication type ⓘ

☐ SSH public key

☒ Password

Username \* ⓘ

azureuser ✓

Password \* ⓘ

..... ✓

Confirm password \* ⓘ

..... ✓

### Inbound port rules

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.


Public inbound ports \* ⓘ

☐ None

☒ Allow selected ports

Select inbound ports \*

SSH (22) ▼

 **This will allow all IP addresses to access your virtual machine.** This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.

### Licensing

If you have eligible Red Hat Enterprise Linux subscriptions that are enabled for Red Hat Cloud Access, you can use Azure Hybrid Benefit to attach your Red Hat subscriptions to this VM and save money on compute costs [Learn more](#)

Your Azure subscription is currently not a part of Red Hat Cloud Access. In order to enable AHB for this VM, you must add this Azure subscription to Cloud Access. [Learn more](#)

[Review + create](#)[< Previous](#)[Next : Disks >](#)

- Choose **premium SSD** for OS local redundancy and leave the data disk blank because the data disks are mounted from ANF storage. Go to the Networking page.

# Create a virtual machine ...

Basics

**Disks**

Networking

Management

Advanced

Tags

Review + create

Azure VMs have one operating system disk and a temporary disk for short-term storage. You can attach additional data disks. The size of the VM determines the type of storage you can use and the number of data disks allowed. [Learn more](#)

## Disk options

OS disk type \*

Premium SSD (locally-redundant storage)

Delete with VM

☒

Enable encryption at host

☐

*Encryption at host is not registered for the selected subscription. [Learn more about enabling this feature](#)*

Encryption type \*

(Default) Encryption at-rest with a platform-managed key

Enable Ultra Disk compatibility

☐

## Data disks for acao-ora01

You can add and configure additional data disks for your virtual machine or attach existing disks. This VM also comes with a temporary disk.

LUN	Name	Size (GiB)	Disk type	Host caching	Delete with VM
<div> <a href="#">Create and attach a new disk</a> <a href="#">Attach an existing disk</a> </div>					

Advanced

Review + create

< Previous

Next : Networking >

- Choose the VNet and subnet. Allocate a public IP for external VM access. Then go to the Management page.


Home > Virtual machines >

## Create a virtual machine ...

### Network interface

When creating a virtual machine, a network interface will be created for you.

Virtual network * ⓘ	<div>ANFAVSVal</div> <div>Create new</div>
Subnet * ⓘ	<div>VM_Sub (172.30.137.128/25)</div> <div>Manage subnet configuration</div>
Public IP ⓘ	<div>(new) acao-ora01-ip</div> <div>Create new</div>
NIC network security group ⓘ	<div><input type="radio"/> None</div> <div><input checked="" type="radio"/> Basic</div> <div><input type="radio"/> Advanced</div>
Public inbound ports * ⓘ	<div><input type="radio"/> None</div> <div><input checked="" type="radio"/> Allow selected ports</div>
Select inbound ports *	<div>SSH (22)</div>

 **This will allow all IP addresses to access your virtual machine.** This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.

Delete public IP and NIC when VM is deleted ⓘ ☒

Enable accelerated networking ⓘ ☒

### Load balancing

You can place this virtual machine in the backend pool of an existing Azure load balancing solution. [Learn more](#) ↗

Place this virtual machine behind an existing load balancing solution? ☐

Review + create

< Previous

Next : Management >

5. Keep all defaults for Management and move to the Advanced page.



Microsoft Azure

Search resources, services, and docs (G+/I)

Home > Virtual machines >

## Create a virtual machine ...

BasicsDisksNetworkingManagementAdvancedTagsReview + create

Configure monitoring and management options for your VM.

### Microsoft Defender for Cloud

Microsoft Defender for Cloud provides unified security management and advanced threat protection across hybrid cloud workloads. [Learn more](#)

Your subscription is protected by Microsoft Defender for Cloud basic plan.

#### Monitoring

Boot diagnostics

☒ Enable with managed storage account (recommended)  
☐ Enable with custom storage account  
☐ Disable

Enable OS guest diagnostics

☐

#### Identity

Enable system assigned managed identity

☐

#### Azure AD

Login with Azure AD

☐

RBAC role assignment of Virtual Machine Administrator Login or Virtual Machine User Login is required when using Azure AD login. [Learn more](#)

Azure AD login now uses SSH certificate-based authentication. You will need to use an SSH client that supports OpenSSH certificates. You can use Azure CLI or Cloud Shell from the Azure Portal. [Learn more](#)

#### Auto-shutdown

Enable auto-shutdown

☐

#### Backup

Review + create

< Previous

Next : Advanced >

6. Keep all defaults for the Advanced page unless you need to customize a VM after deployment with custom scripts. Then go to Tags page.

Home > Virtual machines >

## Create a virtual machine ...

Basics   Disks   Networking   Management   Advanced   Tags   Review + create

Add additional configuration, agents, scripts or applications via virtual machine extensions or cloud-init.

### Extensions

Extensions provide post-deployment configuration and automation.

Extensions ⓘ [Select an extension to install](#)

### VM applications

VM applications contain application files that are securely and reliably downloaded on your VM after deployment. In addition to the application files, an install and uninstall script are included in the application. You can easily add or remove applications on your VM after create. [Learn more](#) ⓘ

[Select a VM application to install](#)

### Custom data

Pass a script, configuration file, or other data into the virtual machine **while it is being provisioned**. The data will be saved on the VM in a known location. [Learn more about custom data for VMs](#) ⓘ

Custom data

**i** Your image must have a code to support consumption of custom data. If your image supports cloud-init, custom-data will be processed by cloud-init. [Learn more about custom data for VMs](#) ⓘ

### User data

Pass a script, configuration file, or other data that will be accessible to your applications **throughout the lifetime of the virtual machine**. Don't use user data for storing your secrets or passwords. [Learn more about user data for VMs](#) ⓘ

Enable user data ☐

[Review + create](#)

[< Previous](#)

[Next : Tags >](#)

7. Add a tag for the VM if desired. Then, go to the Review + create page.

[Home](#) > [Virtual machines](#) >

## Create a virtual machine ...

Basics   Disks   Networking   Management   Advanced   Tags   Review + create

Tags are name/value pairs that enable you to categorize resources and view consolidated billing by applying the same tag to multiple resources and resource groups. [Learn more about tags](#)

Note that if you create tags and then change resource settings on other tabs, your tags will be automatically updated.

Name ⓘ	Value ⓘ	Resource
<input type="text" value="database"/>	<input type="text" value="oracle"/>	12 selected  
<input type="text"/>	<input type="text"/>	12 selected 

Review + create

< Previous

Next : Review + create >

- The deployment workflow runs a validation on the configuration, and, if the validation passes, click **Create** to create the VM.

### 4. Provision ANF database volumes for Oracle

You must create three NFS volumes for an ANF capacity pool for the Oracle binary, data, and log volumes respectively.

1. From the Azure console, under the list of Azure services, click Azure NetApp Files to open a volume creation workflow. If you have more than one ANF storage account, click the account that you would like to provision volumes from.

Microsoft Azure

Search resources, services, and docs (G+)

Azure services

- Create a resource
- Azure NetApp Files
- Virtual networks
- Virtual machines
- Storage accounts
- Users
- Subscriptions
- Azure Active Directory
- Quickstart Center
- More services

Resources

Recent Favorite

Name	Type	Last Viewed
ANFAVSAcct	NetApp account	a few seconds ago
ANFAVSVal	Virtual network	3 hours ago
acao-ora01	Virtual machine	5 days ago
Hybrid Cloud TME Onprem	Subscription	2 weeks ago
WEANFAVSAcct	NetApp account	2 weeks ago
ANFAVSAcct/CapPool/acao-ora01-u03	Volume	2 weeks ago
ANFAVSAcct/CapPool/acao-ora01-u02	Volume	2 weeks ago
ANFAVSAcct/CapPool/acao-ora01-u01	Volume	2 weeks ago
acao-ora01_OsDisk_1_673bad70ccce4709afc81278e2bc97cb	Disk	2 weeks ago
acao-ora0166	Network Interface	3 weeks ago
TMEtstres	Resource group	3 weeks ago

See all

2. Under your NetApp storage account, click **Volumes**, and then **Add volume** to create new Oracle volumes.

Microsoft Azure

Search resources, services, and docs (G+)

Home > Azure NetApp Files >

Azure NetApp Files

Hybrid Cloud TME

Create Manage view

Filter for any field...

Name

- ANFAVSAcct
- WEANFAVSAcct

ANFAVSAcct

NetApp account

Search (Ctrl+J)

Delete

Overview

Activity log

Access control (IAM)

Tags

Settings

- Quota
- Properties
- Locks

Azure NetApp Files

- Active Directory connections

Storage service

- Capacity pools
- Volumes

Data protection

- Snapshot policies

Storage service add-ons

- NetApp add-ons

Automation

- Tasks (preview)
- Export template

Support + troubleshooting

- New Support Request

Essentials

Resource group (move) : ANFAVSRG

Location : South Central US

Subscription (move) : Hybrid Cloud TME Onprem

Subscription ID : 0efa2dfb-917c-4497-b56a-b3f4eadb8111

Tags (edit) : product\_line : Field use - various

Provisioning state : Succeeded

Enterprise files storage, powered by NetApp

Azure NetApp Files makes it easy for enterprise line-of-business (LOB) and storage professionals to migrate and run complex, file-based applications with no code change. Learn more

Connect to Active Directory

Connect your NetApp to Active Directory. Learn more

Capacity pools

Purchase pools of capacity with a service level in which you provision volumes. Learn more

Volumes

Container for active file system, associated meta-data, and snapshots. Learn more

View AD connections

View capacity pools

View volumes

Page 1 of 1

Name	Quota	Throughput	Protocol type	Mount path	Service level	Network features	Capacity pool
anf2-z1-stdds01	200 GiB	25.6 MiB/s	NFSv3	172.30.136.70/anf2-z1-stdc	Ultra	Standard	capool
anf2-z1-stdds02	200 GiB	25.6 MiB/s	NFSv3	172.30.136.70/anf2-z1-stdc	Ultra	Standard	capool
anf2-z1-stdds03	100 GiB	12.8 MiB/s	NFSv3	172.30.136.70/anf2-z1-stdc	Ultra	Standard	capool
anf2-z1-stdds04	100 GiB	12.8 MiB/s	NFSv3	172.30.136.70/anf2-z1-stdc	Ultra	Standard	capool
anf2-z1-stdds05	100 GiB	12.8 MiB/s	NFSv3	172.30.136.70/anf2-z1-stdc	Ultra	Standard	capool
anf2-z1-stdds06	100 GiB	12.8 MiB/s	NFSv3	172.30.136.70/anf2-z1-stdc	Ultra	Standard	capool
anf2-z1-stdds07	100 GiB	12.8 MiB/s	NFSv3	172.30.136.70/anf2-z1-stdc	Ultra	Standard	capool
anf2-z1-stdds08	100 GiB	12.8 MiB/s	NFSv3	172.30.136.70/anf2-z1-stdc	Ultra	Standard	capool
anf-z1-stdds01	6 TiB	786.432 MiB/s	NFSv3	172.30.136.70/anf-z1-stdc	Ultra	Standard	capool
anf-z1-stdds02	200 GiB	25.6 MiB/s	NFSv3	172.30.136.70/anf-z1-stdc	Ultra	Standard	capool

- As a good practice, identify Oracle volumes with the VM hostname as a prefix and then followed by the mount point on the host, such as u01 for Oracle binary, u02 for Oracle data, and u03 for Oracle log. Choose the same VNet for the volume as for the VM. Click **Next: Protocol**.

**Create a volume**

**Basics** | Protocol | Tags | Review + create

This page will help you create an Azure NetApp Files volume in your subscription and enable you to access the volume from within your virtual network. [Learn more about Azure NetApp Files](#)

**Volume details**

Volume name \*

Capacity pool \*

Available quota (GiB)  572 GiB

Quota (GiB) \*  100 GiB

Available throughput (MiB/s)

Throughput (MiB/s)

Enable Cool Access ☐

Coolness Period

Virtual network \*  [Create new virtual network](#)

Delegated subnet \*  [Create new subnet](#)

Network features ☐ ☒

Availability Zone

Show advanced section ☐

[Review + create](#) [< Previous](#) [Next: Protocol >](#)

- Choose the NFS protocol, add the Oracle host IP address to the allowed client, and remove the default policy that allows all IP addresses 0.0.0.0/0. Then click **Next: Tags**.

Microsoft Azure

Search resources, services, and docs (G+)

Home > Azure NetApp Files > ANFAVSAcct | Volumes >

ANFAVSAcct | Volumes

NetApp account

Search (Ctrl+/)

+ Add volume

Search volumes

Overview

Activity log

Access control (IAM)

Tags

Settings

Quota

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Azure NetApp Files

Active Directory connections

Storage service

Capacity pools

Volumes

Data protection

Snapshot policies

Storage service add-ons

NetApp add-ons

Automation

Tasks (preview)

Export template

Support + troubleshooting

New Support Request

Name

Quota

anf2-z1-stdds01

200 GiB

anf2-z1-stdds02

200 GiB

anf2-z1-stdds03

100 GiB

anf2-z1-stdds04

100 GiB

anf2-z1-stdds05

100 GiB

anf2-z1-stdds06

100 GiB

anf2-z1-stdds07

100 GiB

anf2-z1-stdds08

100 GiB

anf-z1-stdds01

6 TiB

anf-z1-stdds02

200 GiB

anf-z1-stdds03

1 TiB

anf-z1-stdds04

200 GiB

anf-z1-stdds06

200 GiB

anf-z1-stdds07

200 GiB

anf-z1-stdds08

200 GiB

anf-zq-stdds05

1 TiB

vol1

1 TiB

vol3basic

100 GiB

volnfsbasic

100 GiB

volnfsstd

100 GiB

volnfsstdnew

100 GiB

zone1basic

6 TiB

zone2basic

100 GiB

Create a volume

Basics

Protocol

Tags

Review + create

Configure access to your volume.

Access

Protocol type

NFS

SMB

Dual-protocol

Configuration

File path \*

aca0-ora01\_u01

Versions \*

NFSv3

Kerberos

Enabled

Disabled

LDAP

Enabled

Disabled

Azure VMware Solution DataStore

Export policy

Configure the volume's export policy. This can be edited later. [Learn more](#)

Move up

Move down

Move to top

Move to bottom

Delete

Index

Allowed clients

Access

Root Access

1

172.30.137.142

Read & Write

On

2

172.30.137.142

Read & Write

On

Review + create

< Previous

Next : Tags >

5. Add a volume tag if desired. Then click **Review + Create**.

Microsoft Azure

Search resources, services, and docs (G+)

Home > Azure NetApp Files > ANFAVSAcct | Volumes >

ANFAVSAcct | Volumes

NetApp account

Search (Ctrl+/)

+ Add volume

...

Overview

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New Support Request

Search volumes

Name	Quota
anf2-z1-stdds01	200 GiB
anf2-z1-stdds02	200 GiB
anf2-z1-stdds03	100 GiB
anf2-z1-stdds04	100 GiB
anf2-z1-stdds05	100 GiB
anf2-z1-stdds06	100 GiB
anf2-z1-stdds07	100 GiB
anf2-z1-stdds08	100 GiB
anf-z1-stdds01	6 TiB
anf-z1-stdds02	200 GiB
anf-z1-stdds03	1 TiB
anf-z1-stdds04	200 GiB
anf-z1-stdds06	200 GiB
anf-z1-stdds07	200 GiB
anf-z1-stdds08	200 GiB
anf-zq-stdds05	1 TiB
vol1	1 TiB
vol3basic	100 GiB
volnfsbasic	100 GiB
volnfsstd	100 GiB
volnfsstdnew	100 GiB
zone1basic	6 TiB
zone2basic	100 GiB

Create a volume

Basics

Protocol

Tags

Review + create

Tags are name/value pairs that enable you to categorize resources and view consolidated billing by applying the same tag to multiple resources and resource groups. [Learn more about tags](#)

Note that if you create tags and then change resource settings on other tabs, your tags will be automatically updated.

Name

Value

database : oracle

Review + create

< Previous

Next : Review + create >

6. If the validation passes, click **Create** to create the volume.

Microsoft Azure

Search resources, services, and docs (G+)

Home > Azure NetApp Files > ANFAVSAcct | Volumes >

ANFAVSAcct | Volumes

NetApp account

Search (Ctrl+/)

Overview

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Search volumes

Name	Quota
anf2-z1-stdds01	200 GiB
anf2-z1-stdds02	200 GiB
anf2-z1-stdds03	100 GiB
anf2-z1-stdds04	100 GiB
anf2-z1-stdds05	100 GiB
anf2-z1-stdds06	100 GiB
anf2-z1-stdds07	100 GiB
anf2-z1-stdds08	100 GiB
anf-z1-stdds01	6 TiB
anf-z1-stdds02	200 GiB
anf-z1-stdds03	1 TiB
anf-z1-stdds04	200 GiB
anf-z1-stdds06	200 GiB
anf-z1-stdds07	200 GiB
anf-z1-stdds08	200 GiB
anf-zq-stdds05	1 TiB
vol1	1 TiB
vol3basic	100 GiB
volnfsbasic	100 GiB
volnfsstd	100 GiB
volnfsstdnew	100 GiB
zone1basic	6 TiB
zone2basic	100 GiB

Create a volume

Validation passed

Basics Protocol Tags Review + create

Basics

Subscription Hybrid Cloud TME Onprem

Resource group ANFAVSRG

Region South Central US

Volume name acao-ora01-u01

Capacity pool CapPool

Service level Ultra

Quota 100 GiB

Encryption key source Microsoft.NetApp

Availability Zone None

Networking

Virtual network ANFAVSV1 (172.30.136.64/26,172.30.137.128/25,172.30.152.0/27)

Delegated subnet ANF\_Sub (172.30.136.64/26)

Network features Standard

Protocol

Protocol NFSv3

File path acao-ora01-u01

Tags

database oracle

Create

< Previous Next >

Download a template for automation

## Install and configure Oracle on Azure VM with ANF

The NetApp solutions team has created many Ansible-based automation toolkits to help you deploy Oracle in Azure smoothly. Follow these steps to deploy Oracle on an Azure VM.

### Set up an Ansible controller

If you have not set up an Ansible controller, see [NetApp Solution Automation](#), which has detailed instructions on how to setup an Ansible controller.

### Obtain Oracle deployment automation toolkit

Clone a copy of the Oracle deployment toolkit in your home directory under the user ID that you use to log into the Ansible controller.

```
git clone https://github.com/NetApp-Automation/na_oracle19c_deploy.git
```



## Execute the toolkit with your configuration

See the [CLI deployment Oracle 19c Database](#) to execute the playbook with the CLI. You can ignore the ONTAP portion of the variables configuration in the global VARS file when you create database volumes from the Azure console rather than the CLI.



The toolkit default deploys Oracle 19c with RU 19.8. It can be easily adapted for any other patch level with minor default configuration changes. Also default seed-database active log files are deployed into the data volume. If you need active log files on the log volume, it should be relocated after initial deployment. Reach out to the NetApp Solution team for help if needed.

## Set up AzAcSnap backup tool for app-consistent snapshots for Oracle

The Azure Application-Consistent Snapshot tool (AzAcSnap) is a command-line tool that enables data protection for third-party databases by handling all the orchestration required to put them into an application-consistent state before taking a storage snapshot. It then returns these databases to an operational state. NetApp recommends installing the tool on the database server host. See the following installation and configuration procedures.

### Install AzAcSnap tool

1. Get the most recent version of the [the AzAcSnap Installer](#).
2. Copy the downloaded self-installer to the target system.
3. Execute the self-installer as the root user with the default installation option. If necessary, make the file executable using the `chmod +x *.run` command.

```
./azacsnap_installer_v5.0.run -I
```

### Configure Oracle connectivity

The snapshot tools communicate with the Oracle database and need a database user with appropriate permissions to enable or disable backup mode.

#### 1. Set up AzAcSnap database user

The following examples show the setup of the Oracle database user and the use of sqlplus for communication to the Oracle database. The example commands set up a user (AZACSNAP) in the Oracle database and change the IP address, usernames, and passwords as appropriate.

1. From the Oracle database installation, launch sqlplus to log into the database.

```
su - oracle
sqlplus / AS SYSDBA
```

2. Create the user.

```
CREATE USER azacsnap IDENTIFIED BY password;
```

3. Grant the user permissions. This example sets the permission for the AZACSNAP user to enable putting the database into backup mode.

```
GRANT CREATE SESSION TO azacsnap;  
GRANT SYSBACKUP TO azacsnap;
```

4. Change the default user's password expiration to unlimited.

```
ALTER PROFILE default LIMIT PASSWORD_LIFE_TIME unlimited;
```

5. Validate azacsnap connectivity for the database.

```
connect azacsnap/password  
quit;
```

## 2. Configure Linux-user azacsnap for DB access with Oracle wallet

The AzAcSnap default installation creates an azacsnap OS user. It's Bash shell environment must be configured for Oracle database access with the password stored in an Oracle wallet.

1. As root user, run the `cat /etc/oratab` command to identify the ORACLE\_HOME and ORACLE\_SID variables on the host.

```
cat /etc/oratab
```

2. Add ORACLE\_HOME, ORACLE\_SID, TNS\_ADMIN, and PATH variables to the azacsnap user bash profile. Change the variables as needed.

```
echo "export ORACLE_SID=ORATEST" >> /home/azacsnap/.bash_profile  
echo "export ORACLE_HOME=/u01/app/oracle/product/19800/ORATST" >>  
/home/azacsnap/.bash_profile  
echo "export TNS_ADMIN=/home/azacsnap" >> /home/azacsnap/.bash_profile  
echo "export PATH=\$PATH:\$ORACLE_HOME/bin" >>  
/home/azacsnap/.bash_profile
```

3. As the Linux user azacsnap, create the wallet. You are prompted for the wallet password.

```
sudo su - azacsnap

mkstore -wrl $TNS_ADMIN/.oracle_wallet/ -create
```

4. Add the connect string credentials to the Oracle Wallet. In the following example command, AZACSNAP is the ConnectString to be used by AzAcSnap, azacsnap is the Oracle Database User, and AzPasswd1 is the Oracle User's database password. You are again prompted for the wallet password.

```
mkstore -wrl $TNS_ADMIN/.oracle_wallet/ -createCredential AZACSNAP
azacsnap AzPasswd1
```

5. Create the `tnsnames.ora` file. In the following example command, HOST should be set to the IP address of the Oracle Database and the Server SID should be set to the Oracle Database SID.

```
echo "# Connection string
AZACSNAP=\"(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP) (HOST=172.30.137.142) (PORT=1521)) (CONNECT_DATA=(SID=ORATST)))\"
" > $TNS_ADMIN/tnsnames.ora
```

6. Create the `sqlnet.ora` file.

```
echo "SQLNET.WALLET_OVERRIDE = TRUE
WALLET_LOCATION=(
    SOURCE=(METHOD=FILE)
    (METHOD_DATA=(DIRECTORY=\$TNS_ADMIN/.oracle_wallet))
) " > $TNS_ADMIN/sqlnet.ora
```

7. Test Oracle access using the wallet.

```
sqlplus /@AZACSNAP as SYSBACKUP
```

The expected output from the command:

```
[azacsnap@acao-ora01 ~]$ sqlplus /@AZACSNAP as SYSBACKUP

SQL*Plus: Release 19.0.0.0.0 - Production on Thu Sep 8 18:02:07 2022
Version 19.8.0.0.0

Copyright (c) 1982, 2019, Oracle. All rights reserved.

Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.8.0.0.0

SQL>
```

## Configure ANF connectivity

This section explains how to enable communication with Azure NetApp Files (with a VM).

1. Within an Azure Cloud Shell session, make sure that you are logged into the subscription that you want to be associated with the service principal by default.

```
az account show
```

2. If the subscription isn't correct, use the following command:

```
az account set -s <subscription name or id>
```

3. Create a service principal using the Azure CLI as in the following example:

```
az ad sp create-for-rbac --name "AzAcSnap" --role Contributor --scopes
/subscriptions/{subscription-id} --sdk-auth
```

The expected output:

```
{
  "clientId": "00aa000a-aaaa-0000-00a0-00aa000aaa0a",
  "clientSecret": "00aa000a-aaaa-0000-00a0-00aa000aaa0a",
  "subscriptionId": "00aa000a-aaaa-0000-00a0-00aa000aaa0a",
  "tenantId": "00aa000a-aaaa-0000-00a0-00aa000aaa0a",
  "activeDirectoryEndpointUrl": "https://login.microsoftonline.com",
  "resourceManagerEndpointUrl": "https://management.azure.com/",
  "activeDirectoryGraphResourceId": "https://graph.windows.net/",
  "sqlManagementEndpointUrl":
"https://management.core.windows.net:8443/",
  "galleryEndpointUrl": "https://gallery.azure.com/",
  "managementEndpointUrl": "https://management.core.windows.net/"
}
```

4. Cut and paste the output content into a file called `oracle.json` stored in the Linux user `azacsnap` user `bin` directory and secure the file with the appropriate system permissions.



Make sure the format of the JSON file is exactly as described above, especially with the URLs enclosed in double quotes (").

## Complete the setup of AzAcSnap tool

Follow these steps to configure and test the snapshot tools. After successful testing, you can perform the first database-consistent storage snapshot.

1. Change into the snapshot user account.

```
su - azacsnap
```

2. Change the location of commands.

```
cd /home/azacsnap/bin/
```

3. Configure a storage backup detail file. This creates an `azacsnap.json` configuration file.

```
azacsnap -c configure --configuration new
```

The expected output with three Oracle volumes:

```
[azacsnap@acao-ora01 bin]$ azacsnap -c configure --configuration new
Building new config file
Add comment to config file (blank entry to exit adding comments): Oracle
snapshot bkup
```

```

Add comment to config file (blank entry to exit adding comments):
Enter the database type to add, 'hana', 'oracle', or 'exit' (for no
database): oracle

=== Add Oracle Database details ===
Oracle Database SID (e.g. CDB1): ORATST
Database Server's Address (hostname or IP address): 172.30.137.142
Oracle connect string (e.g. /@AZACSNAP): /@AZACSNAP

=== Azure NetApp Files Storage details ===
Are you using Azure NetApp Files for the database? (y/n) [n]: y
--- DATA Volumes have the Application put into a consistent state before
they are snapshot ---
Add Azure NetApp Files resource to DATA Volume section of Database
configuration? (y/n) [n]: y
Full Azure NetApp Files Storage Volume Resource ID (e.g.
/subscriptions/.../resourceGroups/.../providers/Microsoft.NetApp/netAppA
ccounts/.../capacityPools/Premium/volumes/...): /subscriptions/0efa2dfb-
917c-4497-b56a-
b3f4eadb8111/resourceGroups/ANFAVSRG/providers/Microsoft.NetApp/netAppAc
counts/ANFAVSAcct/capacityPools/CapPool/volumes/acao-ora01-u01
Service Principal Authentication filename or Azure Key Vault Resource ID
(e.g. auth-file.json or https://...): oracle.json
Add Azure NetApp Files resource to DATA Volume section of Database
configuration? (y/n) [n]: y
Full Azure NetApp Files Storage Volume Resource ID (e.g.
/subscriptions/.../resourceGroups/.../providers/Microsoft.NetApp/netAppA
ccounts/.../capacityPools/Premium/volumes/...): /subscriptions/0efa2dfb-
917c-4497-b56a-
b3f4eadb8111/resourceGroups/ANFAVSRG/providers/Microsoft.NetApp/netAppAc
counts/ANFAVSAcct/capacityPools/CapPool/volumes/acao-ora01-u02
Service Principal Authentication filename or Azure Key Vault Resource ID
(e.g. auth-file.json or https://...): oracle.json
Add Azure NetApp Files resource to DATA Volume section of Database
configuration? (y/n) [n]: n
--- OTHER Volumes are snapshot immediately without preparing any
application for snapshot ---
Add Azure NetApp Files resource to OTHER Volume section of Database
configuration? (y/n) [n]: y
Full Azure NetApp Files Storage Volume Resource ID (e.g.
/subscriptions/.../resourceGroups/.../providers/Microsoft.NetApp/netAppA
ccounts/.../capacityPools/Premium/volumes/...): /subscriptions/0efa2dfb-
917c-4497-b56a-
b3f4eadb8111/resourceGroups/ANFAVSRG/providers/Microsoft.NetApp/netAppAc
counts/ANFAVSAcct/capacityPools/CapPool/volumes/acao-ora01-u03
Service Principal Authentication filename or Azure Key Vault Resource ID

```

```
(e.g. auth-file.json or https://...): oracle.json
Add Azure NetApp Files resource to OTHER Volume section of Database
configuration? (y/n) [n]: n

=== Azure Managed Disk details ===
Are you using Azure Managed Disks for the database? (y/n) [n]: n

=== Azure Large Instance (Bare Metal) Storage details ===
Are you using Azure Large Instance (Bare Metal) for the database? (y/n)
[n]: n

Enter the database type to add, 'hana', 'oracle', or 'exit' (for no
database): exit

Editing configuration complete, writing output to 'azacsnap.json'.
```

4. As the azacsnap Linux user, run the azacsnap test command for an Oracle backup.

```
cd ~/bin
azacsnap -c test --test oracle --configfile azacsnap.json
```

The expected output:

```
[azacsnap@acao-ora01 bin]$ azacsnap -c test --test oracle --configfile
azacsnap.json
BEGIN : Test process started for 'oracle'
BEGIN : Oracle DB tests
PASSED: Successful connectivity to Oracle DB version 1908000000
END   : Test process complete for 'oracle'
[azacsnap@acao-ora01 bin]$
```

5. Run your first snapshot backup.

```
azacsnap -c backup --volume data --prefix ora_test --retention=1
```

Next: [Database protection.](#)

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