

Azure Administrator (AZ-104) | Lab Guide

Version 22.9

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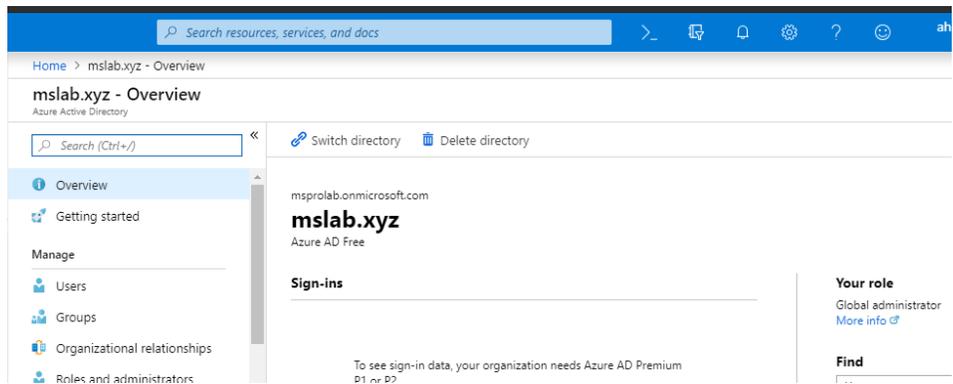
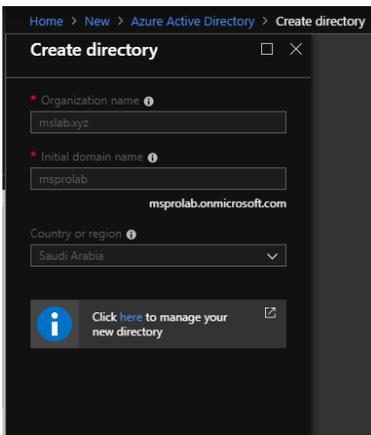
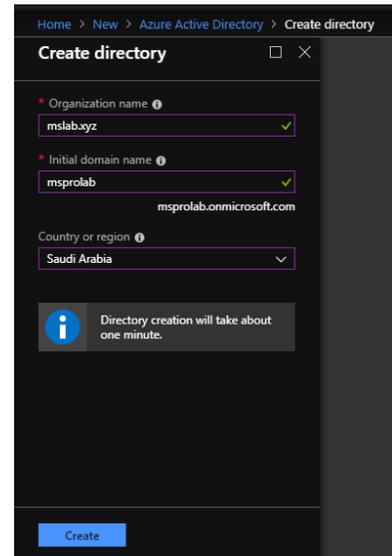
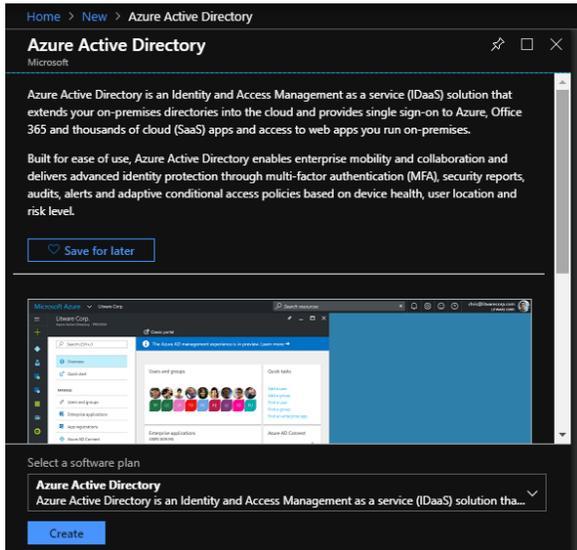
Identity in the Cloud

Important Note: As of now, everything related to Azure AD has been updated to Microsoft Entra ID. The configurations and functionalities remain the same.

AAD is a cloud-based directory and identity management service that provides application access management and identity protection. It's often referred to as **IaaS**.

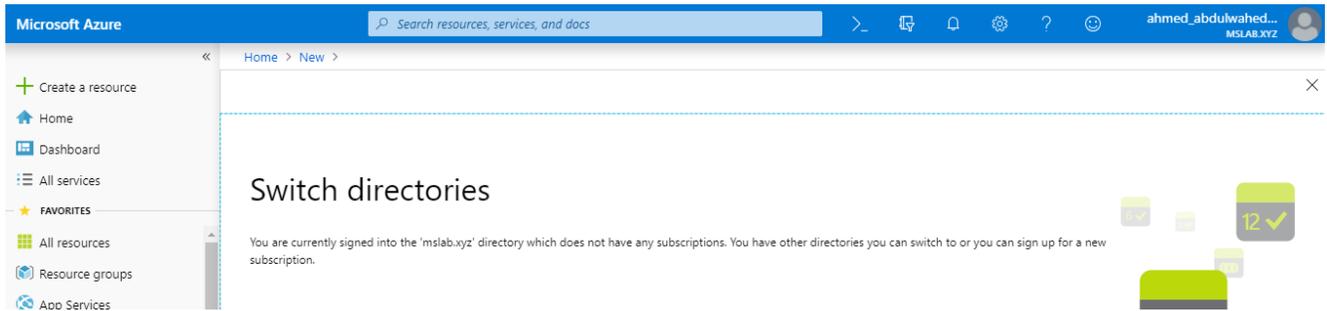
- **Azure Active Directory Free:** Basic identity and access management features for users and groups.
- **Azure Active Directory Basic:** Enhanced user productivity with application access and self-service capabilities.
- **Azure Active Directory Premium P1:** Advanced identity protection, self-service, and access management features.
- **Azure Active Directory Premium P2:** Comprehensive identity protection, advanced monitoring, and security governance.

Creating a new directory (Tenant)

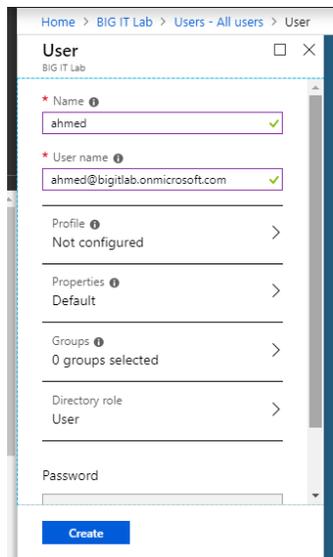
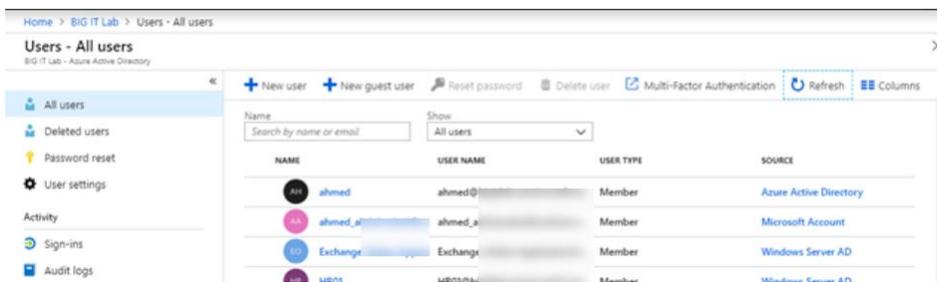


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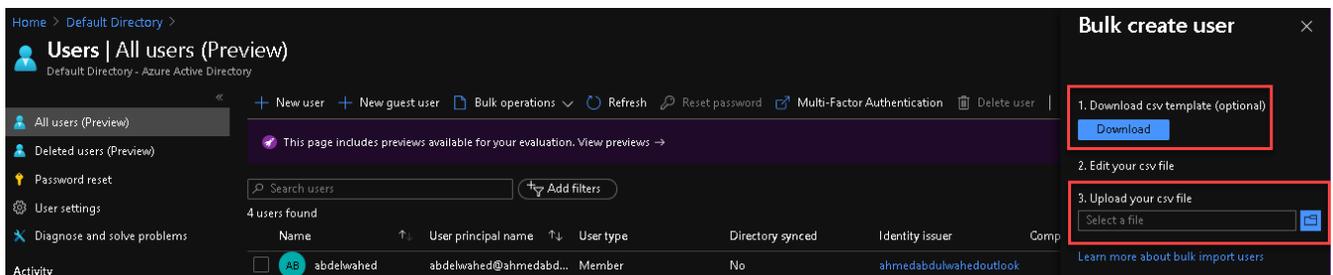
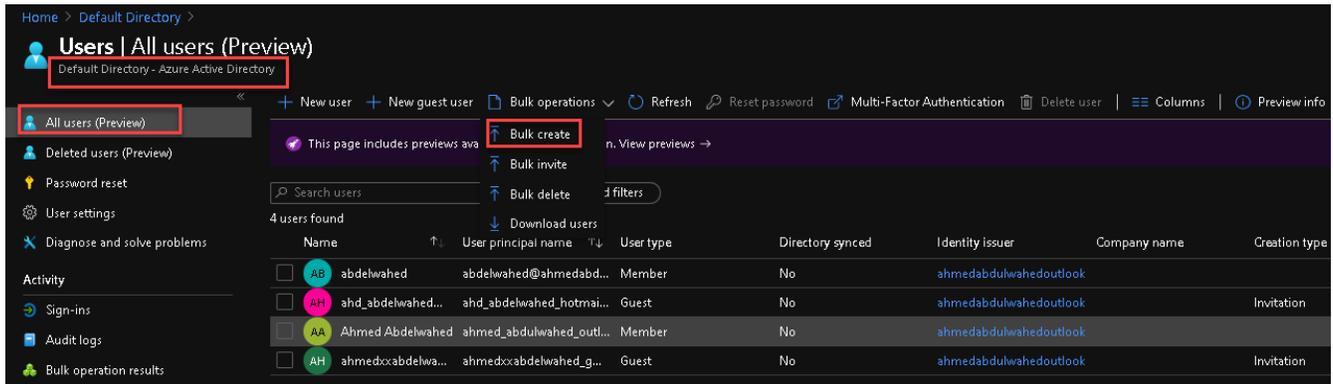
Now you can switch to the new tenant



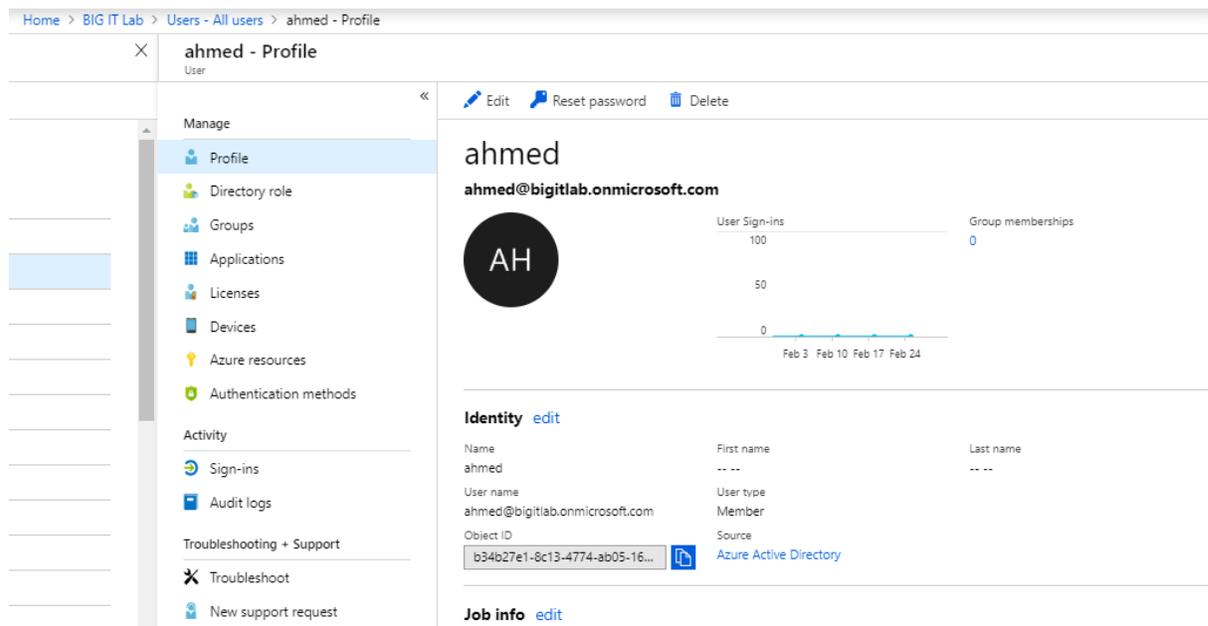
Creating a new user



Bulk User Creation



Managing user options and permissions



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Home > BIG IT Lab > Users - All users > ahmed - Groups

ahmed - Groups

User

Manage

- Profile
- Directory role
- Groups**
- Applications
- Licenses
- Devices
- Azure resources
- Authentication methods

Activity

+ Add Refresh

NAME	GROUP TYPE
Not a member of any groups	

Select Group

Select

Search by name or email address

- DnsAdmins
- DnsUpdateProxy
- Exchange Install Domain Servers
- Exchange Servers

Selected group:

No group selected

Home > BIG IT Lab > Users - All users > ahmed - Directory role

ahmed - Directory role

User

Manage

- Profile
- Directory role**
- Groups
- Applications
- Licenses
- Devices
- Azure resources
- Authentication methods

Activity

- Sign-ins
- Audit logs

Troubleshooting + Support

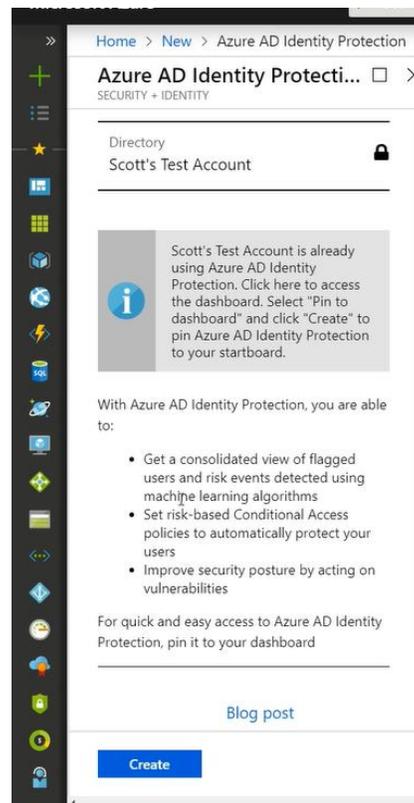
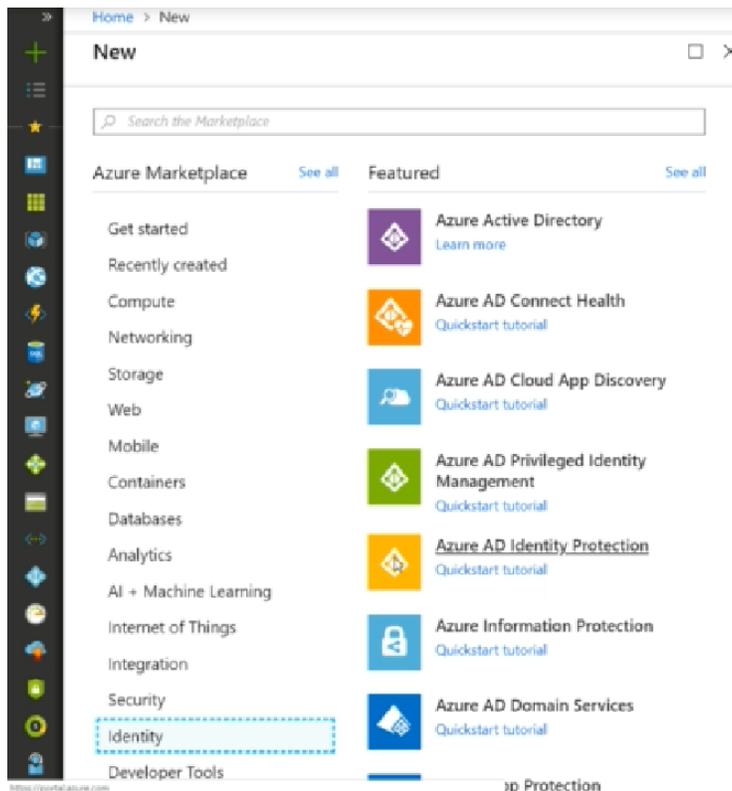
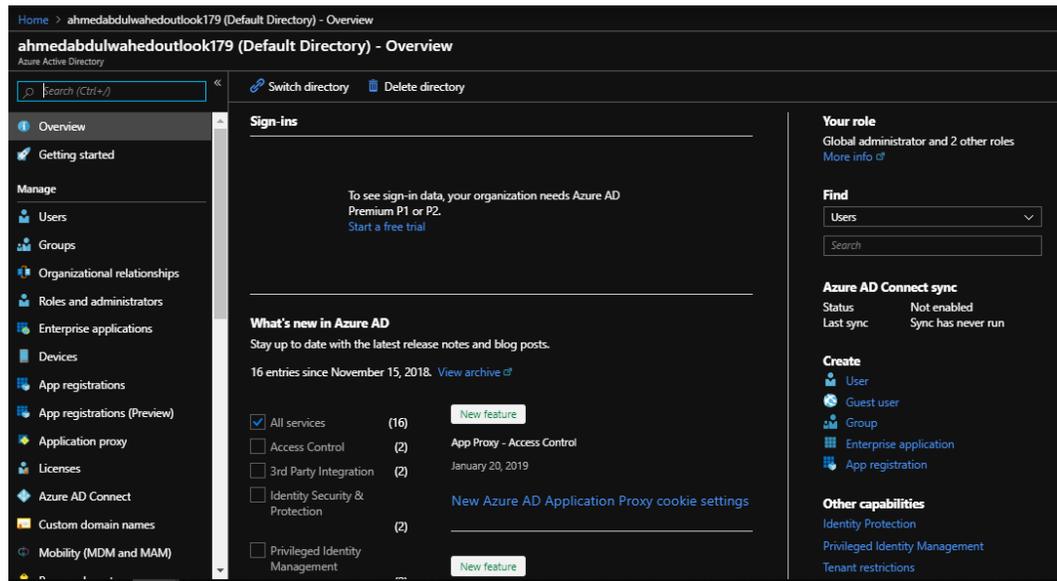
- Troubleshoot
- New support request

+ Add role X Remove

ROLE	DESCRIPTION
Application administrator	Can create and manage all aspects of app registrations and enterprise apps.
Application developer	Can create application registrations independent of the 'Users can register applications' sett...
Authentication administrator	Can access to view, set and reset authentication method information for any non-admin user.
Billing administrator	Can perform common billing related tasks like updating payment information.
Cloud application administrator	Can create and manage all aspects of app registrations and enterprise apps except App Pro...
Cloud device administrator	Full access to manage devices in Azure AD.
Compliance administrator	Can read and manage compliance configuration and reports in Azure AD and Office 365.
Conditional Access administrator	Can manage conditional access capabilities.
Customer LockBox access approver	Can approve Microsoft support requests to access customer organizational data.
Desktop Analytics administrator	Can access and manage Desktop management tools and services.
Dynamics 365 administrator	Can manage all aspects of the Dynamics 365 product.
Exchange administrator	Can manage all aspects of the Exchange product.
Global administrator	Can manage all aspects of Azure AD and Microsoft services that use Azure AD identities.
Guest inviter	Can invite guest users independent of the 'members can invite guests' setting.
Information Protection administrator	Can manage all aspects of the Azure Information Protection product.

Select

Upgrade Azure AD to Premium P2



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Azure AD Identity Protection - Overview
Scott's Test Account

Refresh

Congratulations! You now have access to the new 'Security Overview' of the refreshed Azure AD Identity Protection. Try it out. →

Users flagged for risk

0

Risk events

No risk events detected for the selected date range.

08/25 09/24 10/24

High Medium Low Closed

0 0 0 0

Vulnerabilities

RISK LEVEL COUNT VULNERABILITY

Password reset - Authentication methods
Scott's Test Account - Azure Active Directory

Save Discard

Defines the number of alternate methods of identification a user in this directory must have to reset their password

Number of methods required to reset

1 2

Methods available to users

- Mobile app notification (preview)
- Mobile app code (preview)
- Email
- Mobile phone
- Office phone
- Security questions

Password reset - Authentication methods
Scott's Test Account - Azure Active Directory

Save Discard

Defines the number of alternate methods of identification a user in this directory must have to reset their password

Number of methods required to reset

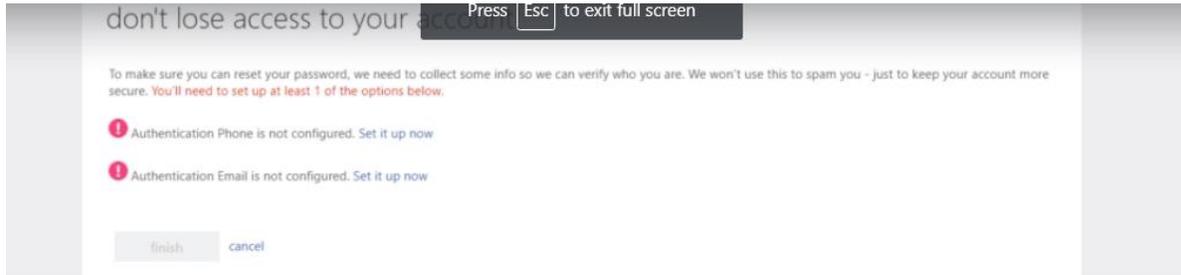
1 2

Methods available to users

- Mobile app notification (preview)
- Mobile app code (preview)
- Email
- Mobile phone
- Office phone
- Security questions

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First time you try to access with that user , you asked to setup MFA

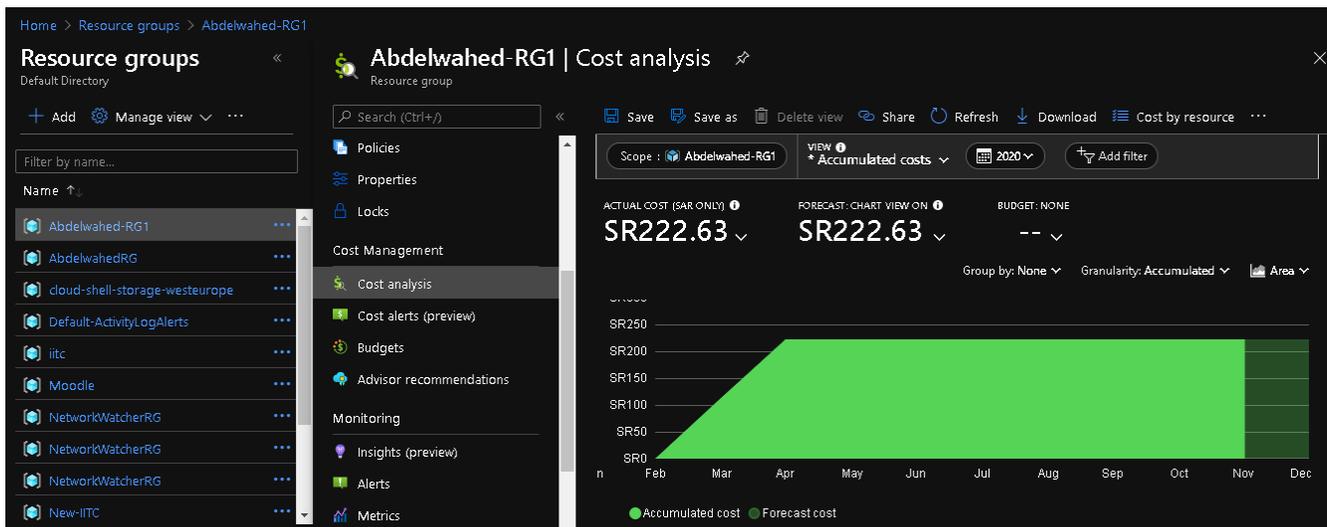


Governance and Compliance

Azure subscription types

- Sponsored subscriptions
- Pay as you go
- Enterprise subscriptions
- Azure for Students subscription (100\$ per month for 12 months)

Cost Management



Resource Tags (Azure resources to logically organize)

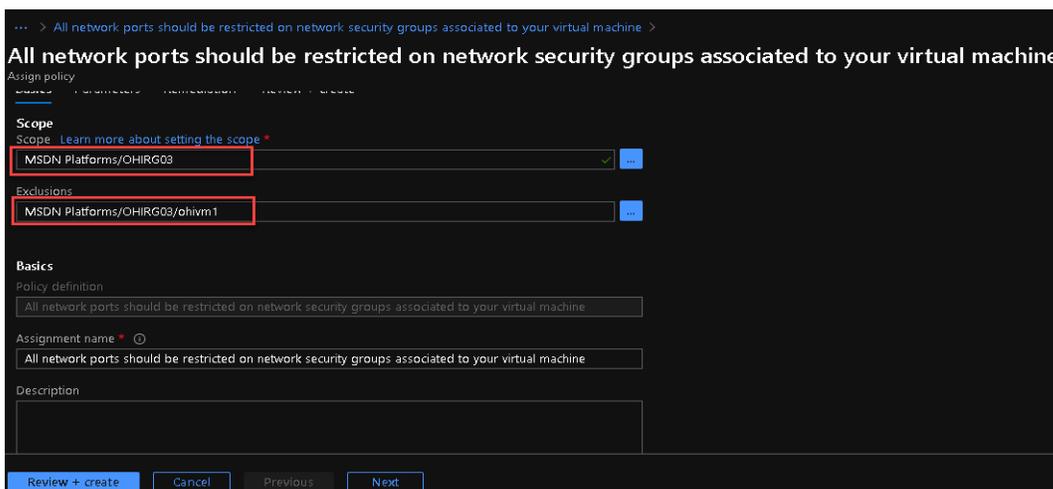
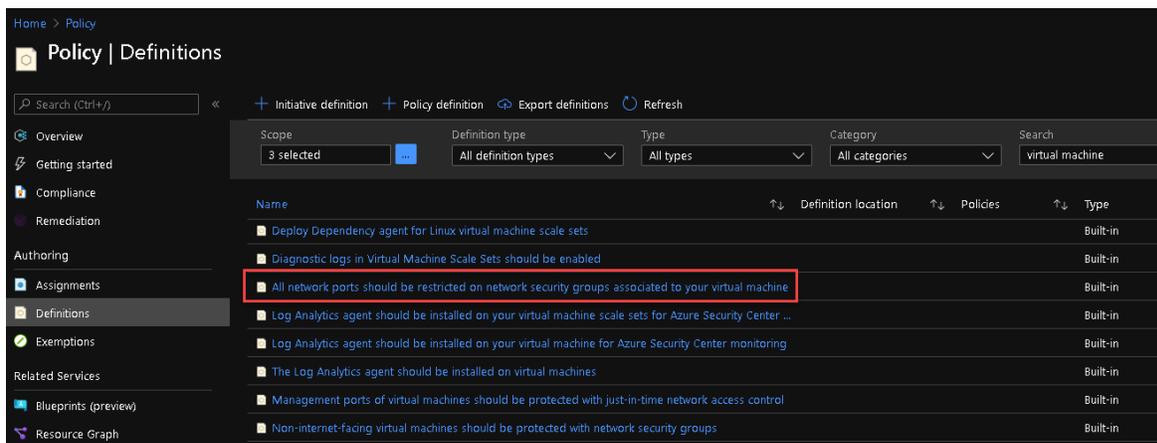
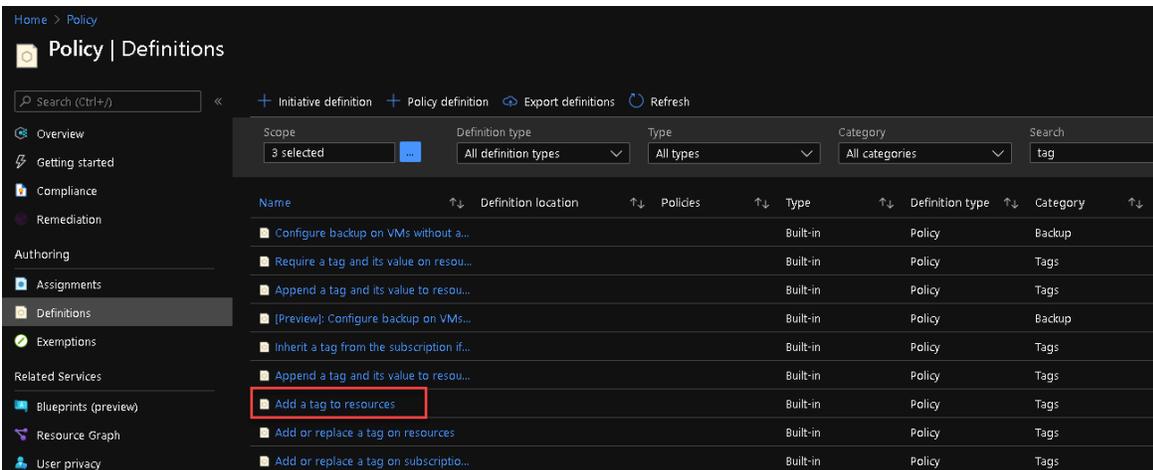
The screenshot shows the Azure Tags interface for the 'Resources with tag Environment : Test'. It lists 6 resources with their respective types, resource groups, locations, and subscriptions. The resources are filtered by 'Subscription == all' and 'Type == all'. The interface includes a left-hand navigation pane with a 'Tags' section and a 'Refresh' button. The top right shows various actions like Edit columns, Refresh, Export to CSV, Open query, Assign tags, and Feedback.

Name	Type	Resource group	Location	Subscription
abdelwahed	App Service	RG	Central US	MSDN Platforms
AbdelwahedCert	App Service Certificate	RG	Global	MSDN Platforms
AbdelwahedCertVault	Key vault	RG	Central US	MSDN Platforms
AbdelwahedHub (abdelwahednoti/Abdelwahed-...	Notification Hub	RG	Central US	MSDN Platforms
abdelwahednoti	Notification Hub Namesp...	RG	Central US	MSDN Platforms
ServicePlan10a1fc46-a829	App Service plan	RG	Central US	MSDN Platforms

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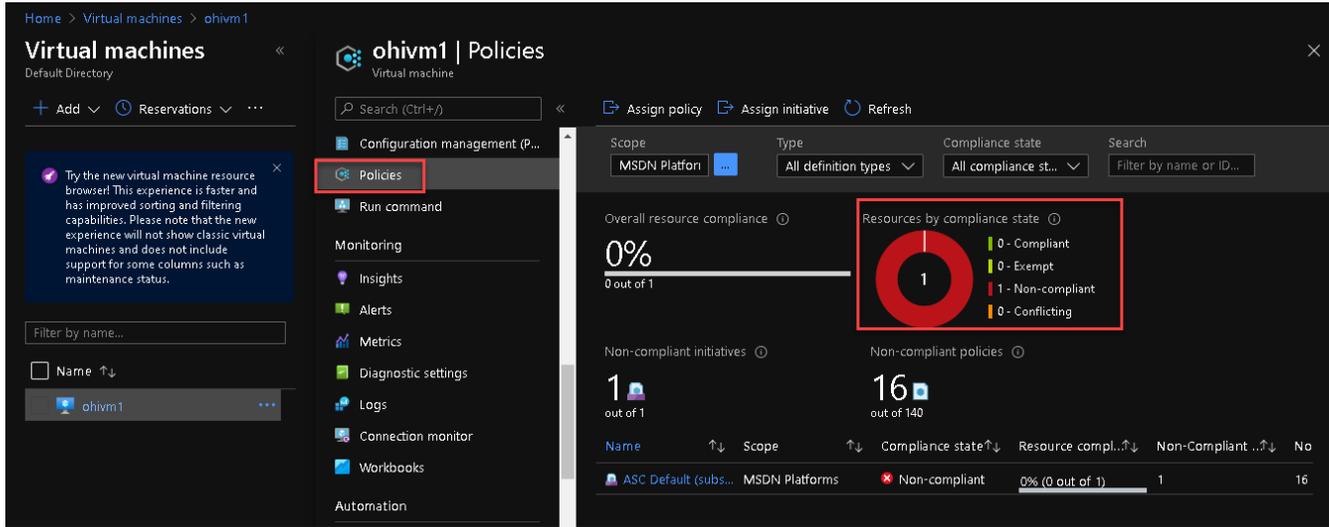
Azure Policy

add your company governance through azure policies so you can detect any non-compliant resource easily.

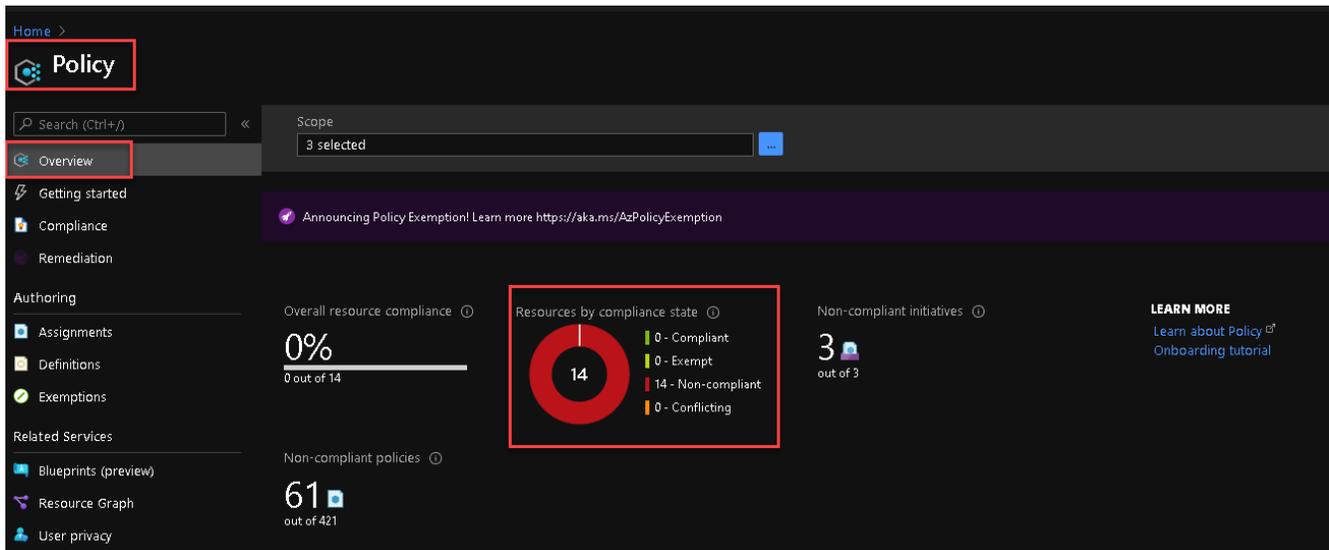


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Now you can see policy stat from resource portal



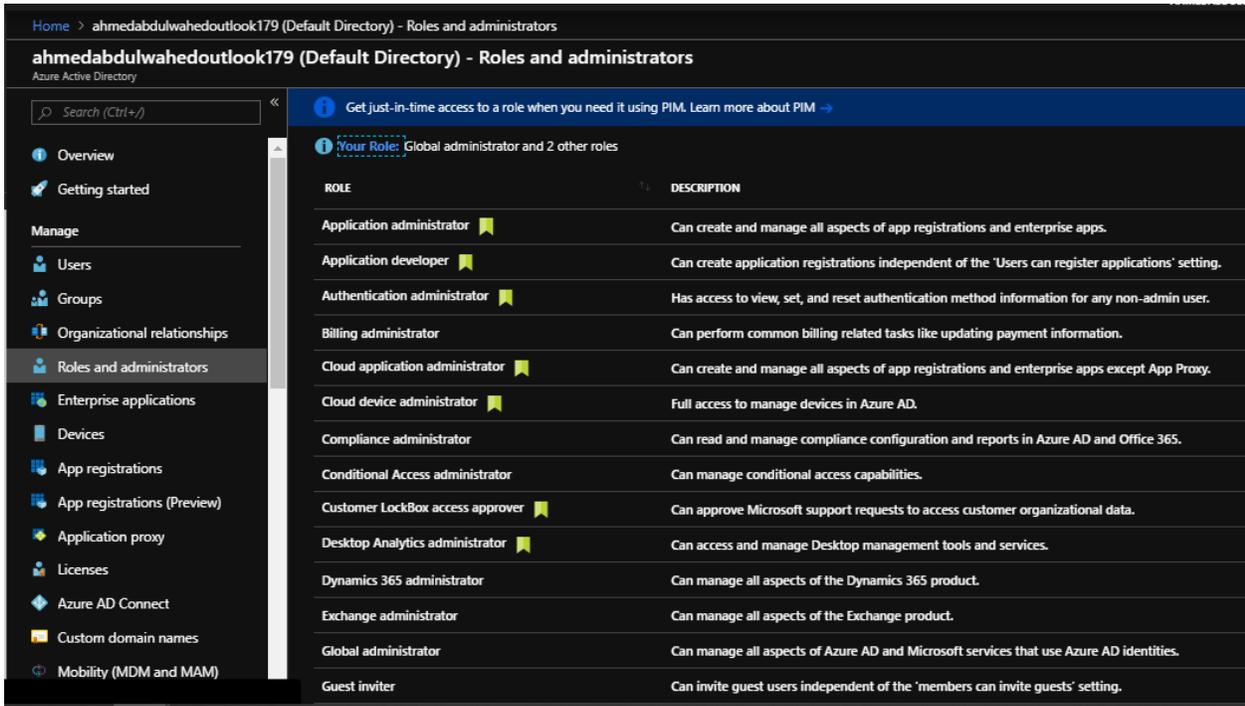
Also, from policy overview you can see summary for your all policies.



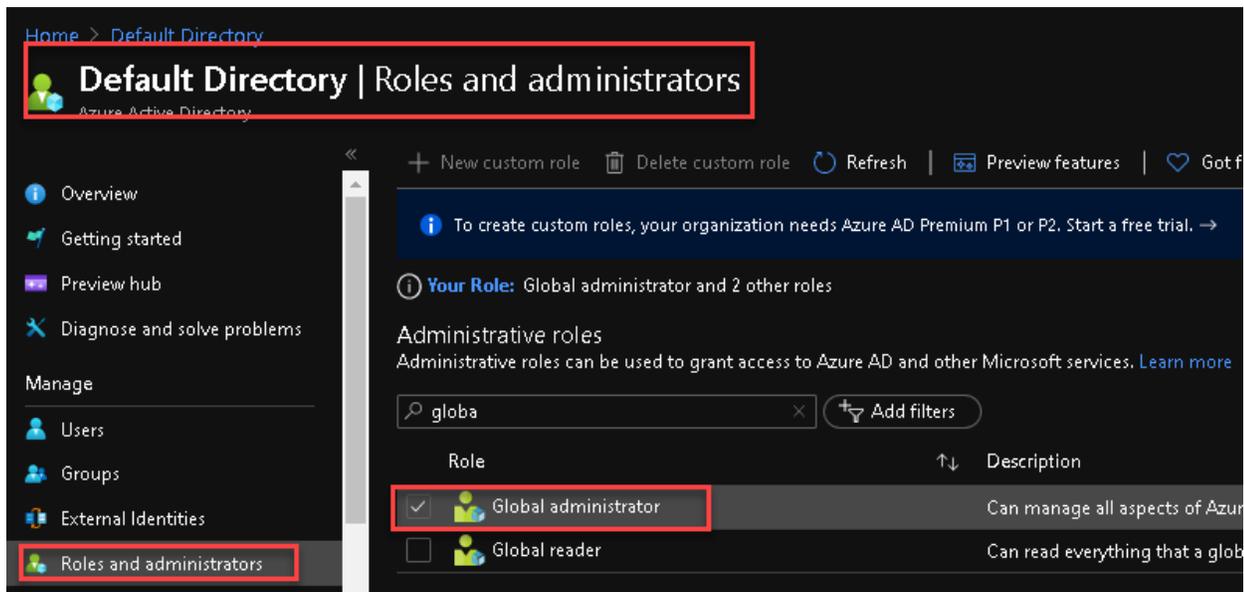
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Role-based access control (RBAC)

is a system that provides fine-grained access management of Azure resources. Using Azure RBAC, you can segregate duties within your team and grant only the amount of access to users that they need to perform their jobs.

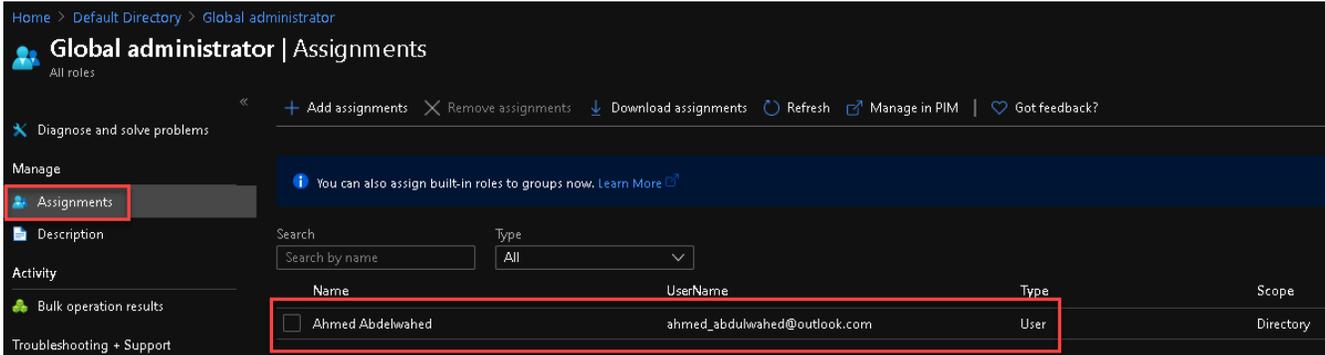


All members of Global admins



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through assignments tab you can see which user has this role.



Assign RBAC using Azure PowerShell and CLI

When you have large numbers of role assignments, you may prefer to use Azure PowerShell or the CLI.

```
#Role assignment properties  
$roleName = "Contributor"  
$assigneeName = ahmed@abdelwahed.me  
$resourceGroupName = "DBRG"
```

Azure PowerShell

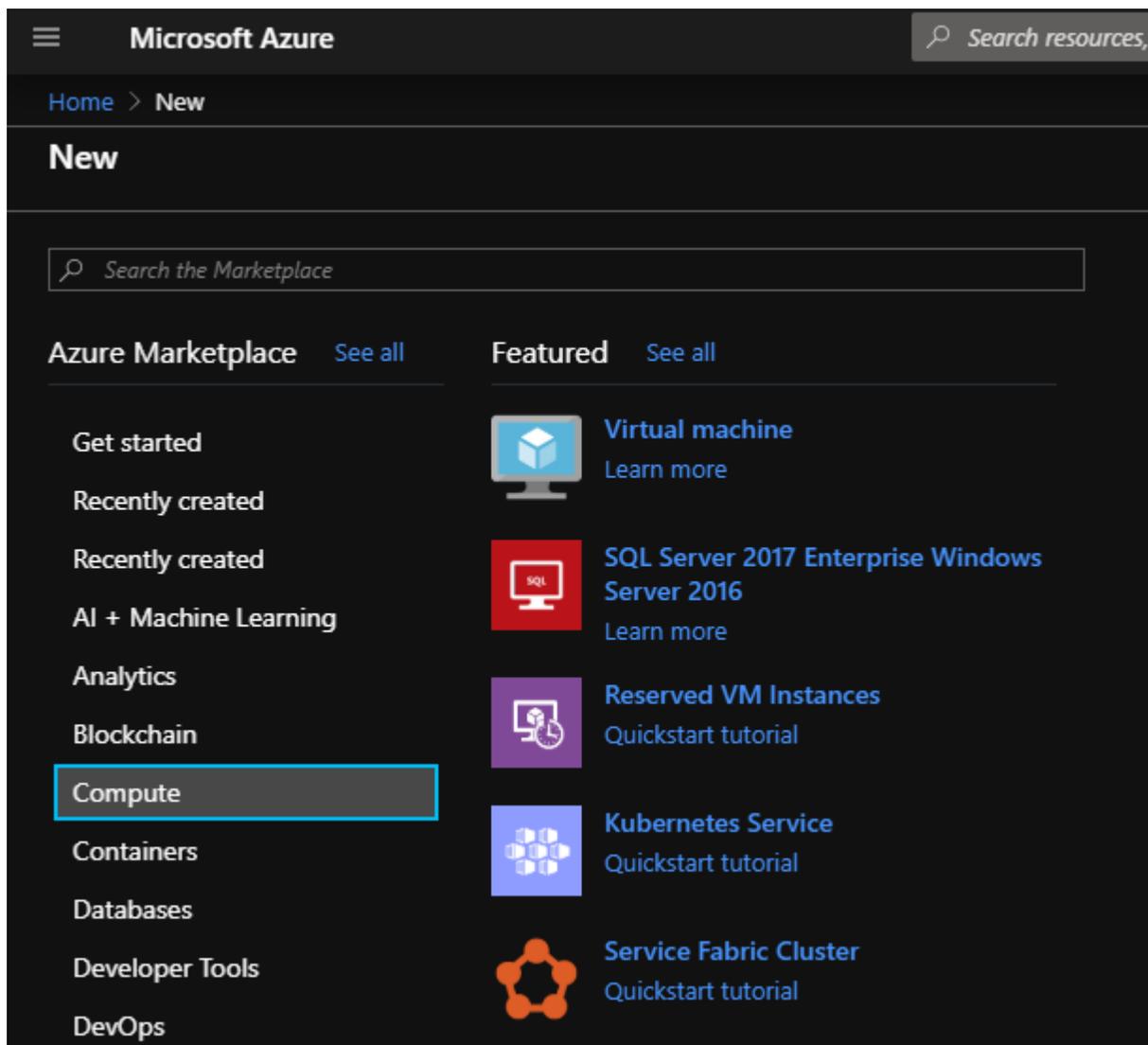
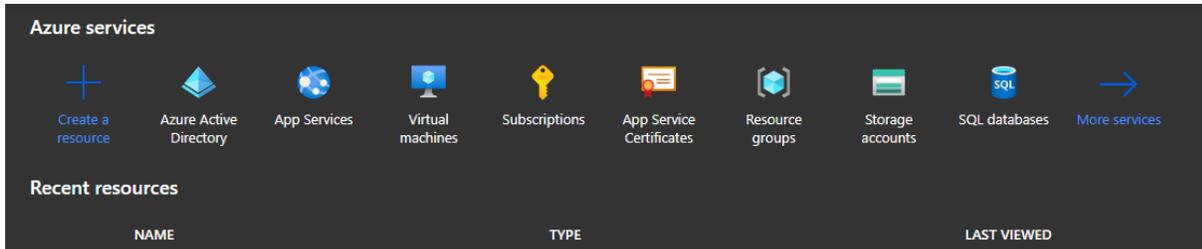
```
New-AzureRmRoleAssignment -RoleDefinitionName $roleName -SignInName $assigneeName -  
ResourceGroupName $resourceGroupName
```

CLI

```
az role assignment create --role $roleName --assignee $assigneeName --resource-group $resourceGroupName
```

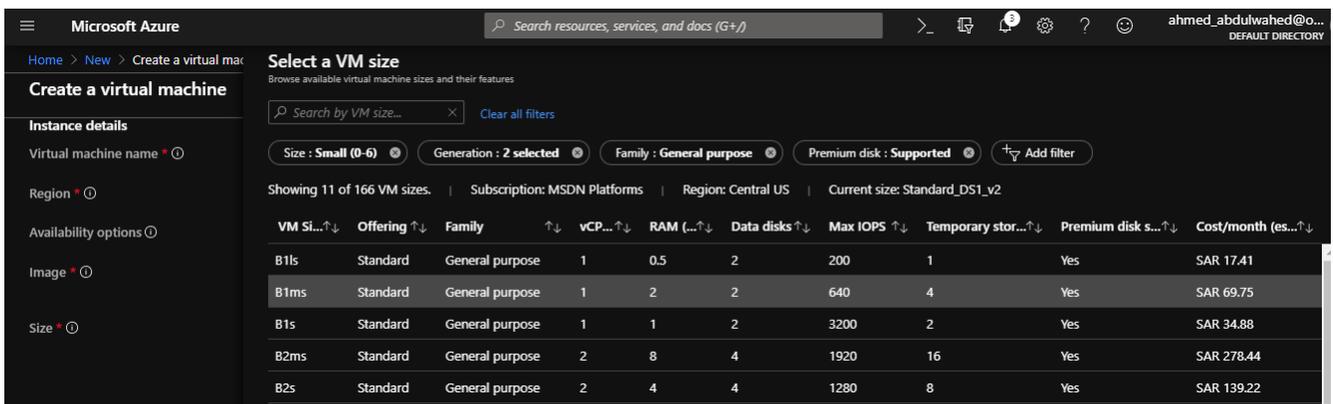
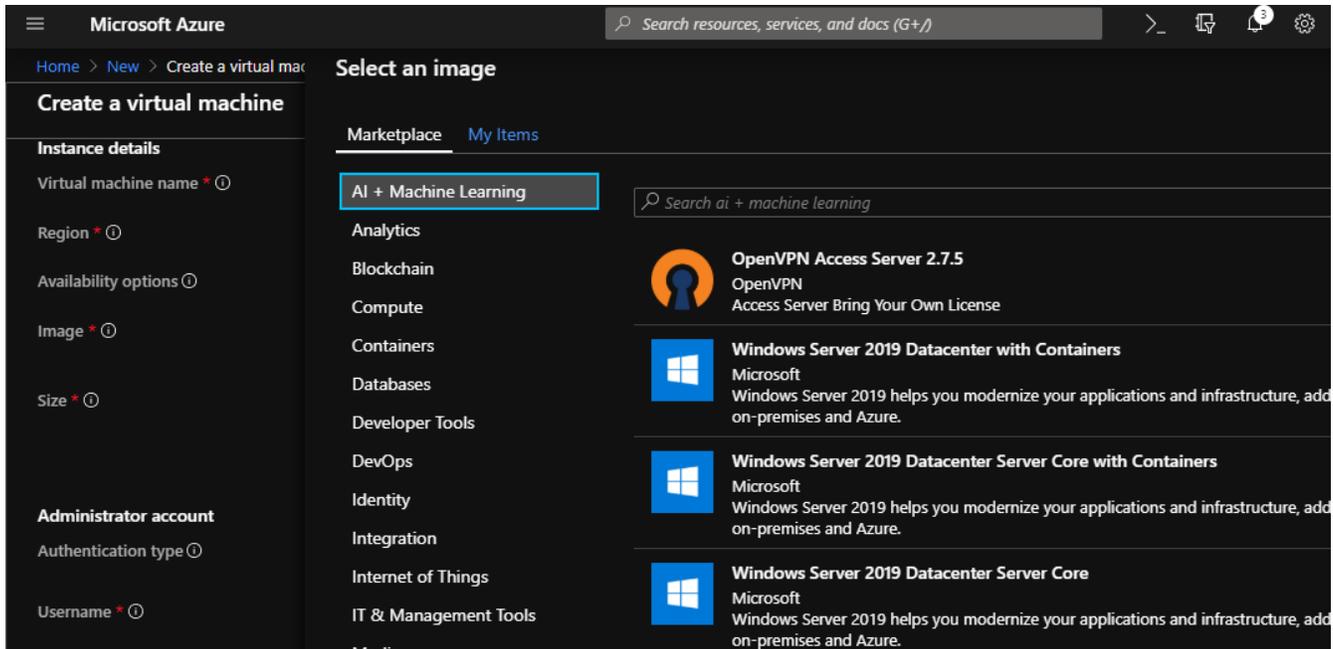
Azure Virtual Machines

Creating Virtual Machines in the Portal



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in first page fill the requested info starting with resource group, VM name, Image source, user name and password to access and VM size



Home > New > Create a virtual machine

Create a virtual machine

Virtual machine name * ⓘ

Region * ⓘ

Availability options ⓘ

Image * ⓘ
[Browse all public and private images](#)

Size * ⓘ **Standard B1ms**
1 vcpu, 2 GiB memory
[Change size](#)

Administrator account

Username * ⓘ

Password * ⓘ

Confirm password * ⓘ

Home > New > Create a virtual machine

Create a virtual machine

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 *

⚠ 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.

Save money

Save up to 49% with a license you already own using Azure Hybrid Benefit. [Learn more](#)

Already have a Windows Server license? * Yes No ⓘ

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Next Page its related for Disks options, you can add data disk from here or you can add it later

Create a virtual machine

Disk options

OS disk type * ⓘ Premium SSD ^

Enable Ultra Disk compatibility ⓘ

Standard HDD

Standard SSD

Premium SSD

Data disks

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
-----	------	------------	-----------	--------------

[Create and attach a new disk](#) [Attach an existing disk](#)

Advanced

Use managed disks ⓘ No Yes

Use ephemeral OS disk ⓘ No Yes

Next page for network options

Network interface

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

Virtual network * ⓘ (new) AZ-103-vnet v

[Create new](#)

Subnet * ⓘ (new) default (10.0.1.0/24) v

Public IP ⓘ (new) Abdelwahed-VM01-ip v

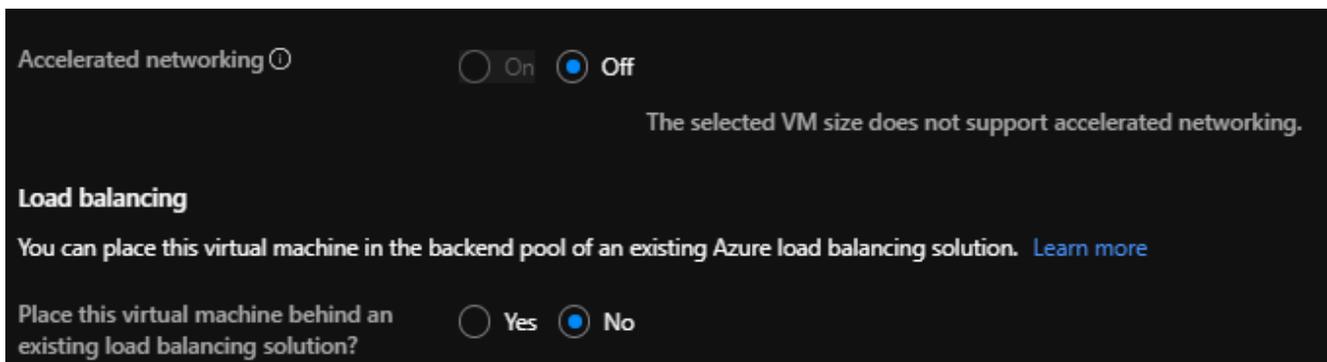
[Create new](#)

NIC network security group ⓘ None Basic Advanced

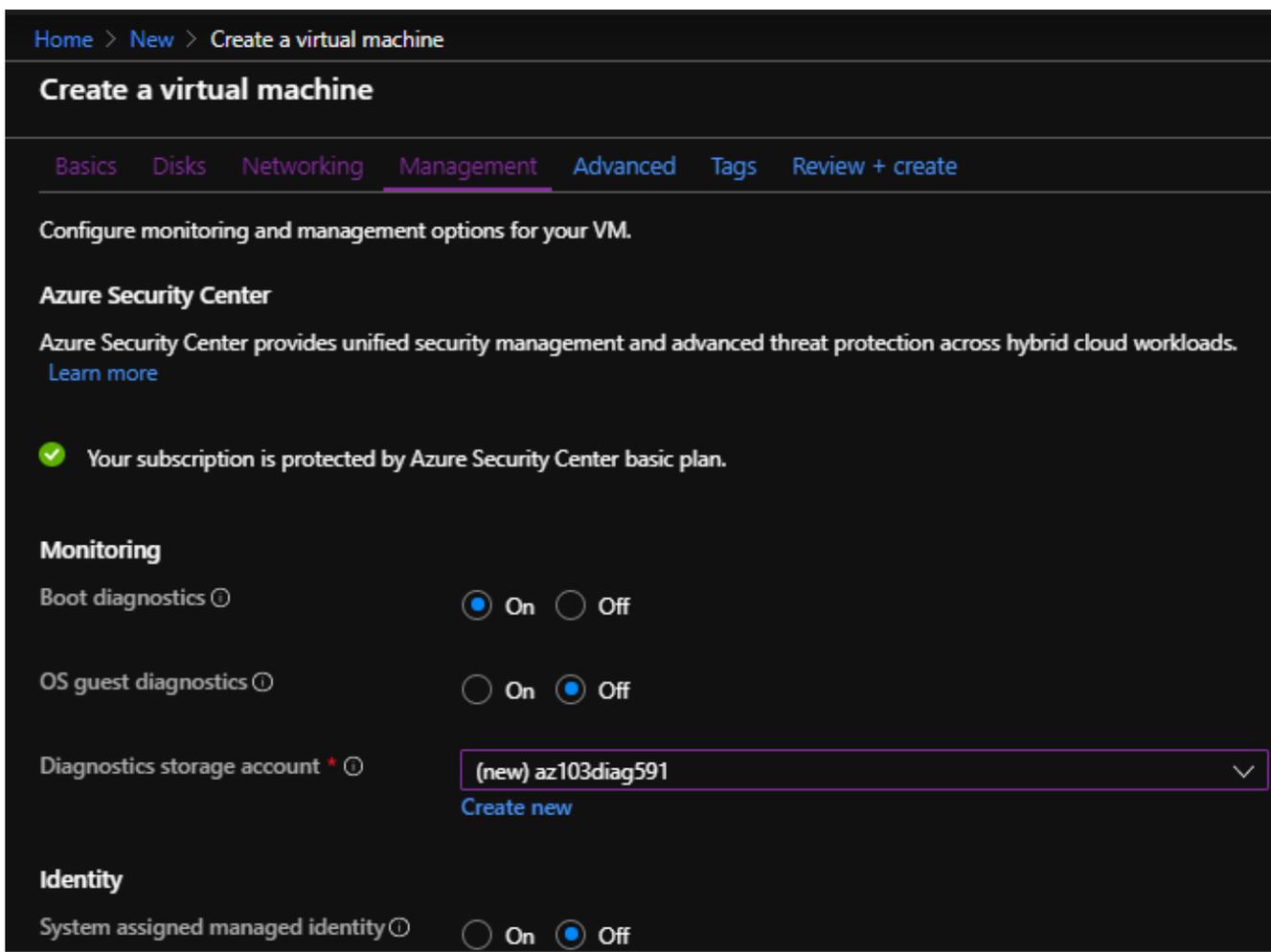
Public inbound ports * ⓘ None Allow selected ports

Select inbound ports * HTTP (80), HTTPS (443), SSH (22), RDP (3389) v

⚠ 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.



Next page is to add some management options like automatic shutdown machine



Identity
System assigned managed identity On Off

Auto-shutdown
Enable auto-shutdown On Off
Shutdown time
Time zone
Notification before shutdown On Off
Email

Backup
Enable backup On Off

Now you can go direct to review your configuration and start deployment

Home > New > Create a virtual machine

Create a virtual machine

✓ Validation passed

Basics

Subscription	MSDN Platforms
Resource group	(new) AZ-103
Virtual machine name	Abdelwahed-VM01
Region	(US) Central US
Availability options	No infrastructure redundancy required
Username	aabdelwahed
Public inbound ports	RDP, HTTP, HTTPS, SSH
Already have a Windows Server license?	No

Disks

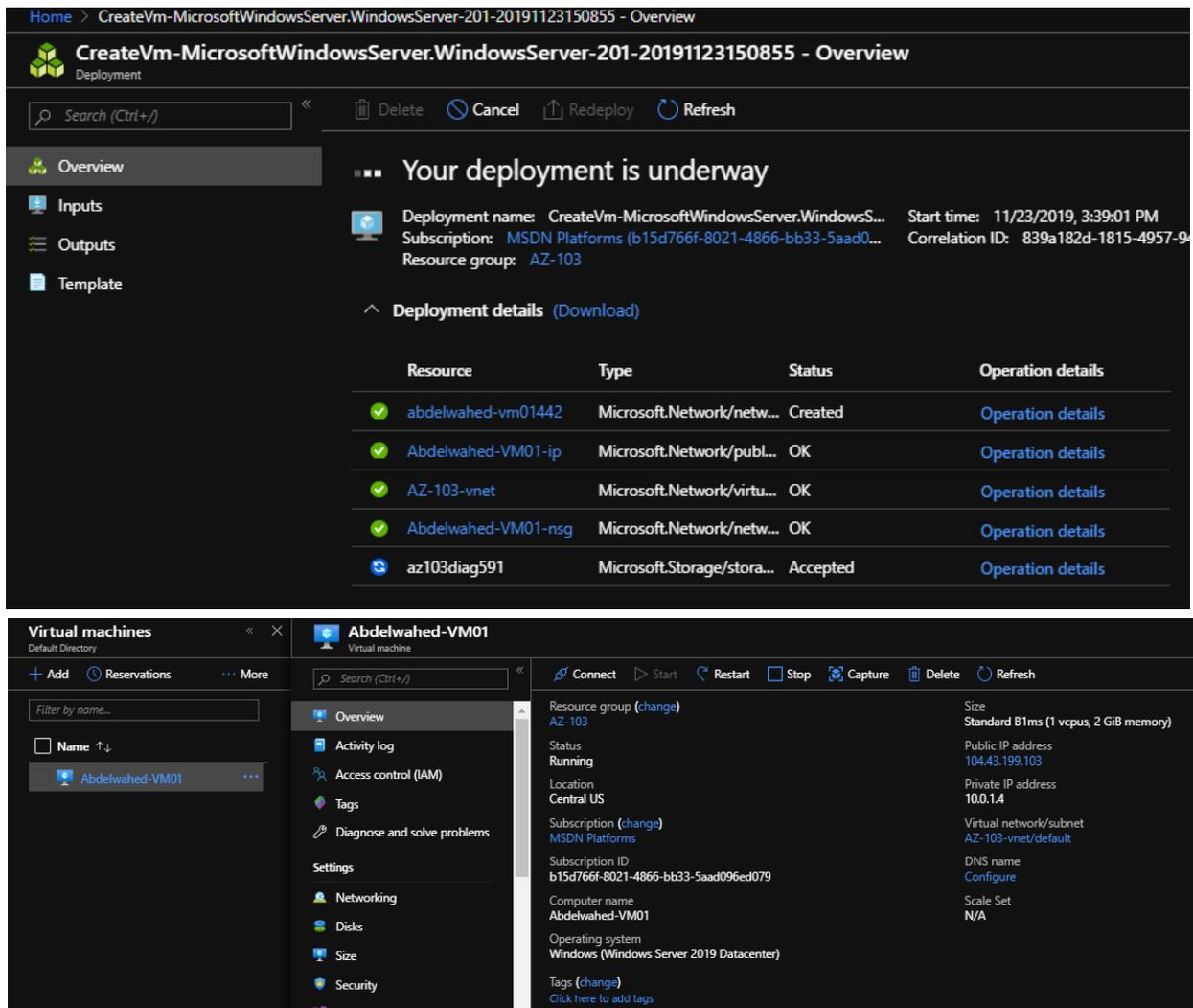
OS disk type	Premium SSD
Use managed disks	Yes
Use ephemeral OS disk	No

Networking

Virtual network	(new) AZ-103-vnet
Subnet	(new) default (10.0.1.0/24)

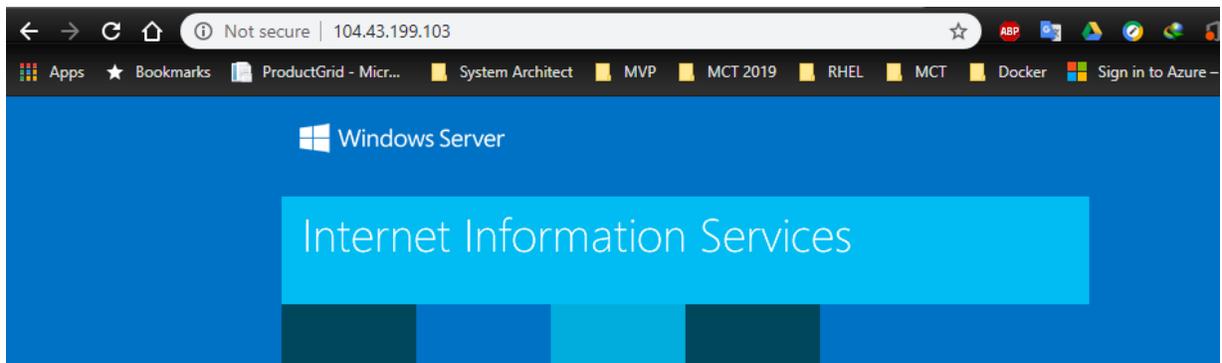
[Create](#) [< Previous](#) [Next >](#) [Download a template for automation](#)

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now you can connect to it by RDP and install different services you need, in the following example will add web server role

```
Install-WindowsFeature -name Web-Server -IncludeManagementTools
```



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Creating a Virtual Machine with PowerShell

First connect to your account using `Connect-AzAccount` and select specific subscription

```
Administrator: Windows PowerShell
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\WINDOWS\system32> Connect-AzAccount

Account                SubscriptionName TenantId Environment
-----                -
ahmed_abdulwahed@outlook.com MSDN Platforms AzureCloud

PS C:\WINDOWS\system32> Get-AzResourceGroup

ResourceGroupName : AbdelwahedRG
Location           : centralus
ProvisioningState  : Succeeded
Tags               :
ResourceId         : /subscriptions/.../resourceGroups/AbdelwahedRG

PS C:\WINDOWS\system32> Get-AzSubscription

Name                Id                TenantId State
-----                -
MSDN Platforms     6f                0        Enabled
MSDN Platforms     a7                0        Enabled
MSDN Platforms     b1                0        Enabled

PS C:\WINDOWS\system32> Connect-AzAccount -Subscription b15

Account                SubscriptionName TenantId Environment
-----                -
ahmed_ab             MSDN Platforms  061f                AzureCloud

PS C:\WINDOWS\system32> Connect-AzAccount -Tenant
```

```
$cred = Get-Credential
$vm = New-AzVMConfig -VMName az103vm -VMSize Standard_D1
$vm = Set-AzVMOperatingSystem `
>> -VM $vm `
>> -Windows `
>> -ComputerName az103vm `
>> -Credential $cred `
>> -ProvisionVMAgent -EnableAutoUpdate
$vm = Set-AzVMSourceImage `
>> -VM $vm `
>> -PublisherName MicrosoftWindowsServer `
>> -Offer WindowsServer `
>> -Skus 2016-Datacenter `
>> -Version latest

New-AzVm `
>> -ResourceGroupName "az103RG" `
>> -Name "az103vm" `
>> -Location "East US" `
>> -VirtualNetworkName "az103vnet" `
>> -SubnetName "az103subnet" `
>> -SecurityGroupName "az103SG" `
>> -PublicIpAddressName "az103PublicAddress" `
```

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>> -OpenPorts 80,3389

Finally, you will ask to provide login credential

```
Administrator: Windows PowerShell
PS C:\WINDOWS\system32> $um = New-AzVMConfig -VMName az103vm -VMSize Standard_D1

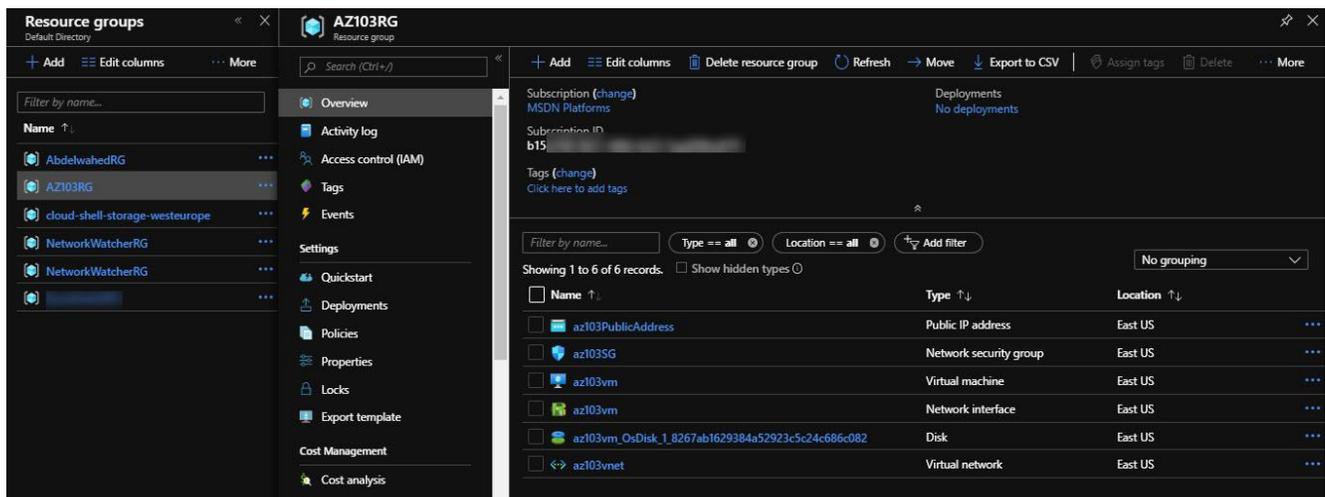
Creating Azure resources
26%
|
Creating virtualMachines/az103vm.

>> -UM $um
>> -PublisherName MicrosoftWindowsServer
>> -Offer WindowsServer
>> -Sku 2019-Datacenter
>> -Version latest
PS C:\WINDOWS\system32> New-AzVM
>> -ResourceGroupName "az103RG"
>> -Name "az103vm"
>> -Location "East US"
>> -VirtualNetworkName "az103vnet"
>> -SubnetName "az103subnet"
>> -SecurityGroupName "az103SG"
>> -PublicIpAddressName "az103PublicAddress"
>> -OpenPorts 80,3389

cmdlet New-AzVM at command pipeline position 1
Supply values for the following parameters:
Credential

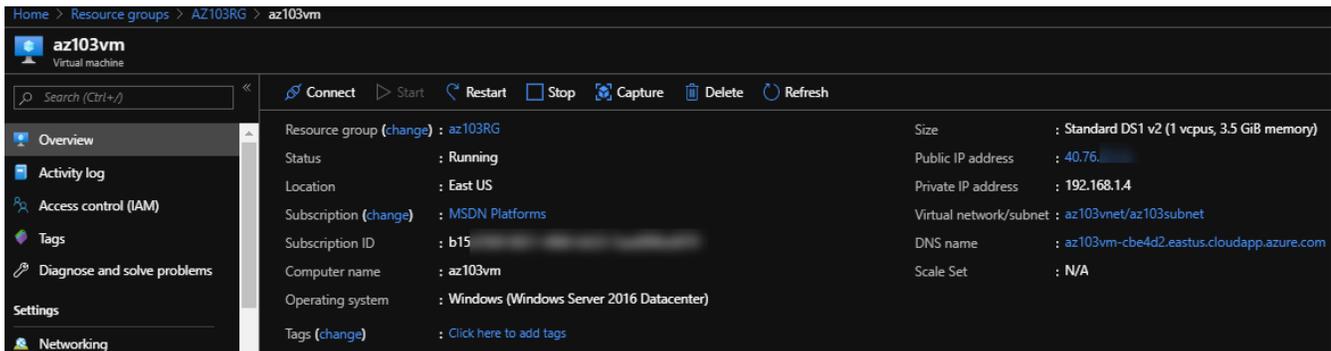
cmdlet New-AzVM at command pipeline position 1
Supply values for the following parameters:
Credential

ResourceGroupName      : az103RG
Id                    : /subscriptions/b15d766f-8021-4866-bb33-5aad096ed079/resourceGroups/az103RG/providers/Microso
ft.Compute/virtualMachines/az103vm
VmId                  : 552f8344-5793-492a-9a8b-5363ae90bd98
Name                  : az103vm
Type                  : Microsoft.Compute/virtualMachines
Location              : eastus
Tags                  : {}
HardwareProfile       : <VMSize>
NetworkProfile        : <NetworkInterfaces>
OSProfile              : <ComputerName, AdminUsername, WindowsConfiguration, Secrets, AllowExtensionOperations>
ProvisioningState     : Succeeded
StorageProfile        : <ImageReference, OsDisk, DataDisks>
FullyQualifiedDomainName : az103vm-685fe9.East US.cloudapp.azure.com
```



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try to connect vm using `mstsc /v:PublicIP`



The screenshot displays the Azure portal interface for a virtual machine named 'az103vm'. The breadcrumb navigation at the top reads 'Home > Resource groups > AZ103RG > az103vm'. The left-hand navigation pane includes sections for 'Overview', 'Activity log', 'Access control (IAM)', 'Tags', 'Diagnose and solve problems', 'Settings', and 'Networking'. The main content area features a toolbar with 'Connect', 'Start', 'Restart', 'Stop', 'Capture', 'Delete', and 'Refresh' buttons. Below the toolbar, the VM's configuration is listed in two columns:

Resource group (change)	: az103RG	Size	: Standard DS1 v2 (1 vcpu, 3.5 GiB memory)
Status	: Running	Public IP address	: 40.76.192.168
Location	: East US	Private IP address	: 192.168.1.4
Subscription (change)	: MSDN Platforms	Virtual network/subnet	: az103vnet/az103subnet
Subscription ID	: b15...	DNS name	: az103vm-cbe4d2.eastus.cloudapp.azure.com
Computer name	: az103vm	Scale Set	: N/A
Operating system	: Windows (Windows Server 2016 Datacenter)		
Tags (change)	: Click here to add tags		

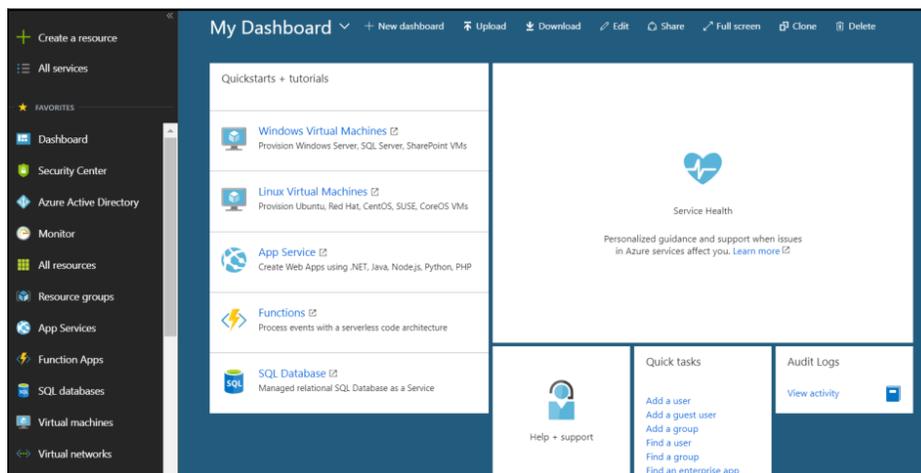
to clean up your resources use `Remove-AzResourceGroup -Name AZ103RG`

Azure Administration

Azure Resource Manager

Azure Resource Manager enables you to work with the resources in your solution as a group. You can deploy, update, or delete all the resources for your solution in a single, coordinated operation. You use a template for deployment and that template can work for different environments such as testing, staging, and production. Resource Manager provides security, auditing, and tagging features to help you manage your resources after deployment.

<https://portal.azure.com>



ARM templates, Microsoft stepped up and really changed cloud business. In the cloud and in DevOps, the **Infrastructure as code (IaC)** concept is very important and that was exactly what ARM templates were. You are able to create an ARM template and **reuse it multiple times to create similar environments**. By doing so, you automated your infrastructure deployment steps and removed possible mistakes in the deployment and configuration process.

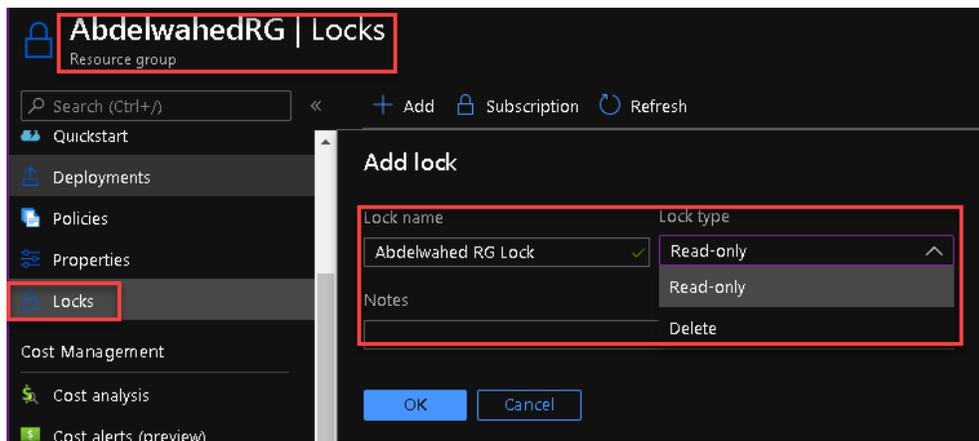
Managing Resources from ARM

Resource Manager Locks

Lock types

There are two types of resource locks.

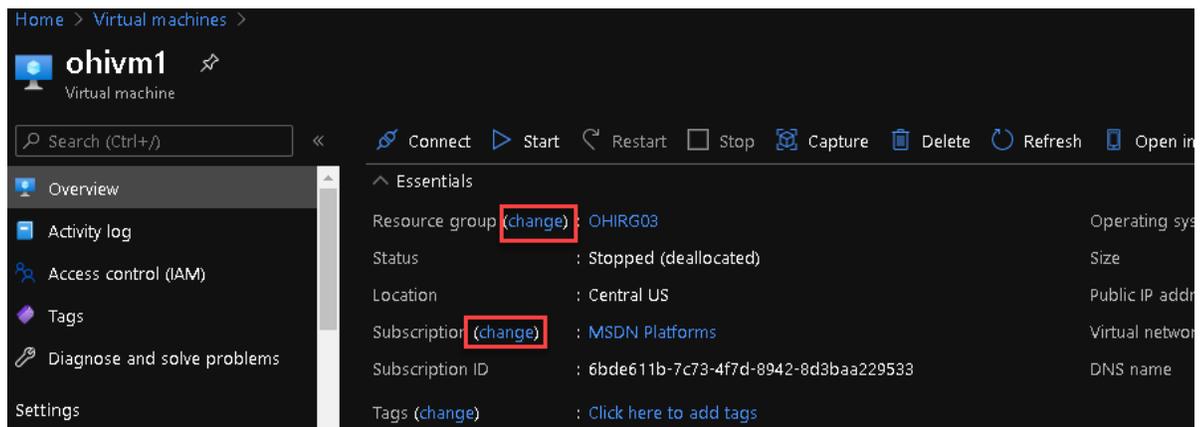
- **Read-Only locks**, which prevent any changes to the resource.
- **Delete locks**, which prevent deletion.
- ✓ Only the Owner and User Access Administrator roles can create or delete management locks.



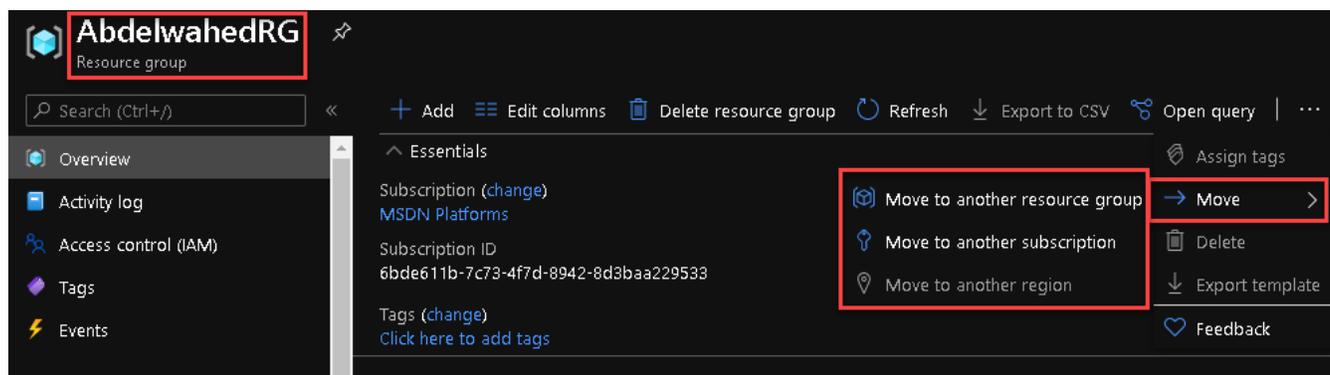
Moving Resources

Sometimes you may need to move resources to either a new subscription or a new resource group in the same subscription.

The following way from resource.



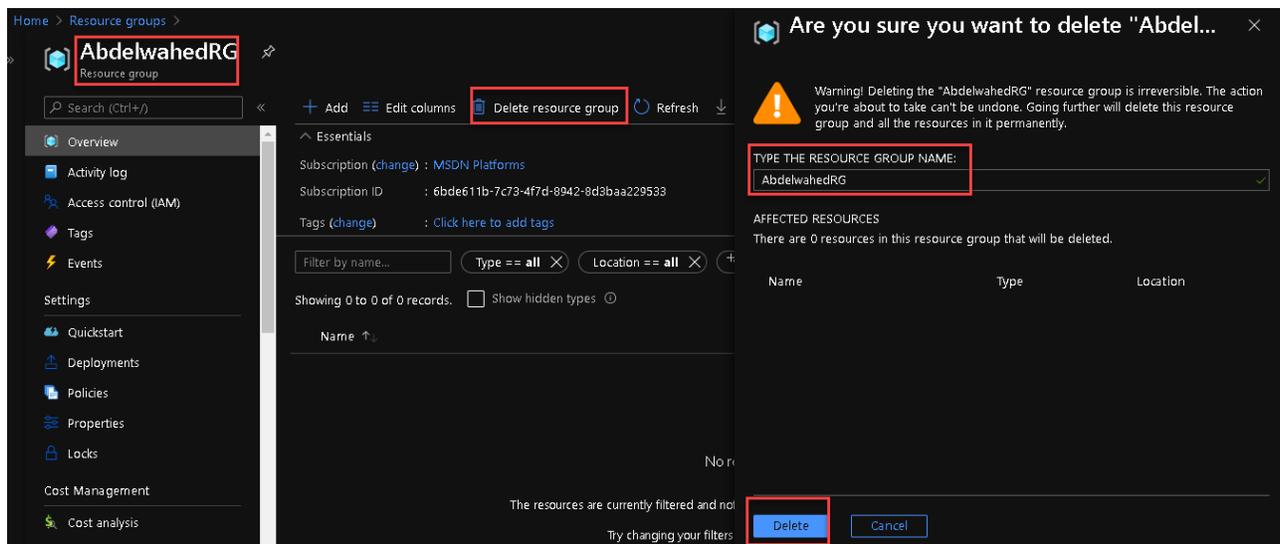
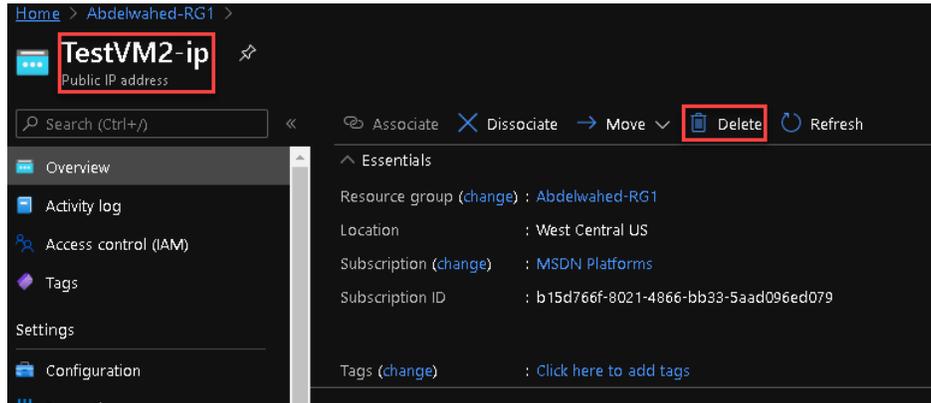
Another way from resource group as shown down.



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Removing Resources and Resource Groups

If you delete RG all resources included will removed also. Or you can delete some resources inside resource group.



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Resource Limits

You can use each Microsoft Azure resource up to its quota. Each subscription has separate quotas and usage is tracked per subscription. If you reach a quota cap, you can request an increase via [Help + Support](#).

The screenshot shows the 'Usage + quotas' page in the Azure portal. The page title is 'MSDN Platforms | Usage + quotas'. The subscription is 'MSDN Platforms'. The location is 'Central US'. The table below shows the following data:

Quota	Provider	Location	Usage
Total Regional vCPUs	Microsoft.Compute	Central US	0 % 0 of 20
Virtual Machine Scale Sets	Microsoft.Compute	Central US	0 % 0 of 2500
Premium Storage Managed Disks	Microsoft.Compute	Central US	0 % 0 of 50000
Static Public IP Addresses	Microsoft.Network	Central US	0 % 0 of 10
Public IP Addresses	Microsoft.Network	Central US	0 % 0 of 10
Subnets per Virtual Network	Microsoft.Network	Central US	0 % 0 of 3000
Peering per Virtual Network	Microsoft.Network	Central US	0 % 0 of 500
Storage Accounts	Microsoft.Storage	Central US	0 % 0 of 250

Manage Azure Resources using cloud shell connect from local PowerShell

```
PS C:\WINDOWS\system32> Install-Module -name azuread
PS C:\WINDOWS\system32> Get-Module azuread
PS C:\WINDOWS\system32> Connect-AzureAD
```

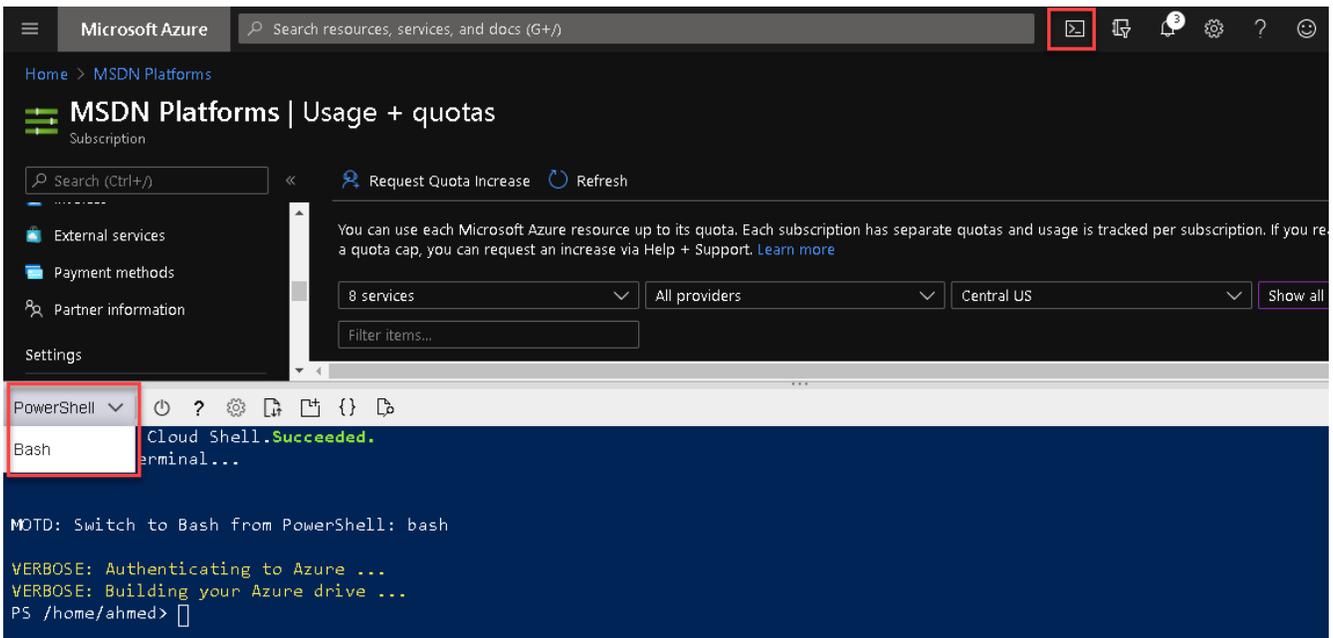
```
PS C:\WINDOWS\system32> Get-AzureADUser

ObjectID                DisplayName              UserPrincipalName
-----
ca351d00-8ca5-4b96-a431-95f40a77ca56 Ahmed Abdelwahed       ahmed@IITCLab10.onmicrosoft.com
00d9b105-24fb-47f1-989b-74d423f7ed09 Ali Mohamed            hr01@IITCLab10.onmicrosoft.com
584875fc-38a2-4e88-bea3-0c251164d46c HR01                   hr01@IITCLab10.onmicrosoft.com
498d9341-1f0b-40fa-898f-1a06dc73d48a HR02                   hr02@IITCLab10.onmicrosoft.com
a7243505-6756-43ce-b76a-57d9e89c6054 HR03                   hr03@IITCLab10.onmicrosoft.com
a7ff0ce1-c34c-4a17-8b3a-ce267777f402 HR04                   hr04@IITCLab10.onmicrosoft.com
8039effb-4b54-45c1-89b4-c78f4831393f HR05                   hr05@IITCLab10.onmicrosoft.com
a5e45c1a-57e6-4a63-9e0f-e6b0854ee2ba IT01                   it01@IITCLab10.onmicrosoft.com
3d90cbcs-a650-4d00-8237-a84a95a96939 IT02                   it02@IITCLab10.onmicrosoft.com
b86f1ba9-f514-49d5-9f4a-f53c87946fb2 IT03                   it03@IITCLab10.onmicrosoft.com
da051d88-2cba-4e28-bc5a-b9195336f20c IT04                   it04@IITCLab10.onmicrosoft.com
5a03e00d-d36a-4b3f-a017-04664d6972a6 IT05                   it05@IITCLab10.onmicrosoft.com
```

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- Get-AzureRmSubscription | gm
- help Get-AzureRmTenant -examples
- Get-AzureRmTenant
- Get-AzureRmNetworkUsage
- Get-Module -ListAvailable
- **Get-azurerm, commands start with azureRm**
- Install-Module az, install azure module
- Login-azureRmAccount

Through cloud shell



- az account list

Azure CLI and Working with Azure CLI Locally

Azure CLI is a command-line program to connect to Azure and execute administrative commands on Azure resources. It runs on Linux, macOS, and Windows, and allows administrators and developers to execute their commands through a terminal or a command-line prompt, (or script!) instead of a web browser. For example, to restart a VM, you would use a command such as the following:

You can download this tool <https://aka.ms/installazurecliwindows> and install it.

- Az login
- Az account list
- az group list
- az vm list
- Az storage list
- Az vm create
- Az group create

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ARM Templates

There are two ways to deploy resource using ARM template

- 1- Download resource template and follow instruction below

Install-Module AzureRM

Install-Module Azure

Download and install Azure Cli

Set-ExecutionPolicy -Scope process -ExecutionPolicy Bypass

cd E:\ExportedTemplate

.\deploy.ps1 -subscriptionId a7632f95-7f0d-4342-adda-dbc286dbe45c -resourceGroupName AZ300RG -deploymentName az300deploy1

```
PS E:\ExportedTemplate-CreateVm-MicrosoftWindowsServer.WindowsServer-200-20190317161336> .\deploy.ps1 -subscriptionId a7632f95-7f0d-4342-adda-dbc286dbe45c -resourceGroupName AZ300 -deploymentName az300deploy1
Logging in...
Selecting subscription 'a7632f95-7f0d-4342-adda-dbc286dbe45c'
Account          SubscriptionName TenantId          Environment
-----
ahmed_abdulwahed@outlook.com MSDN Platforms 06163712-12c2-4ae9-8e69-73d879a0e896 AzureCloud

Name          : MSDN Platforms (a7632f95-7f0d-4342-adda-dbc286dbe45c) - ahmed_abdulwahed@outlook.com
Account       : ahmed_abdulwahed@outlook.com
Environment   : AzureCloud
Subscription  : a7632f95-7f0d-4342-adda-dbc286dbe45c
Tenant        : 06163712-12c2-4ae9-8e69-73d879a0e896
TokenCache    : Microsoft.Azure.Commands.Common.Authentication.ProtectedFileTokenCache
VersionProfile :
ExtendedProperties : {}

Registering resource providers
Registering resource provider 'microsoft.network'

ProviderNamespace : Microsoft.Network
RegistrationState  : Registered
ResourceTypes     : {virtualNetworks, natGateways, publicIPAddresses, networkInterfaces...}
Locations         : {West US, East US, North Europe, West Europe...}
ZoneMappings      :

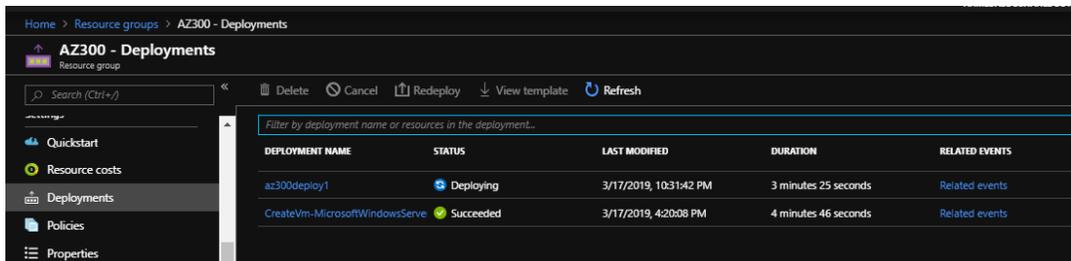
Registering resource provider 'microsoft.compute'

ProviderNamespace : Microsoft.Compute
RegistrationState  : Registered
ResourceTypes     : {availabilitySets, virtualMachines, virtualMachines/extensions, virtualMachineScaleSets...}
Locations         : {East US, East US 2, West US, Central US...}
ZoneMappings      :

Registering resource provider 'microsoft.devtestlab'

ProviderNamespace : Microsoft.DevTestLab
RegistrationState  : Registered
ResourceTypes     : {labs, schedules, labs/virtualMachines, labs/serviceRunners...}
Locations         : {West Central US, Japan East, West US, Australia Central...}
ZoneMappings      :

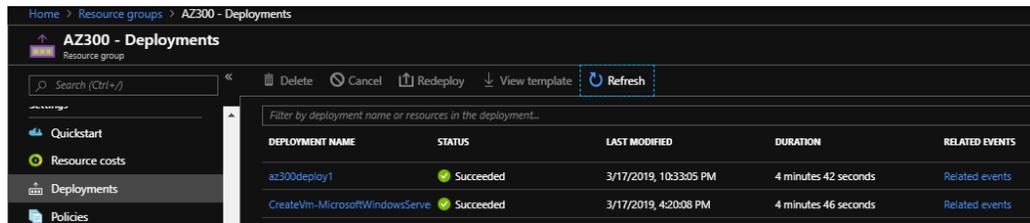
Using existing resource group 'AZ300'
Starting deployment...
```



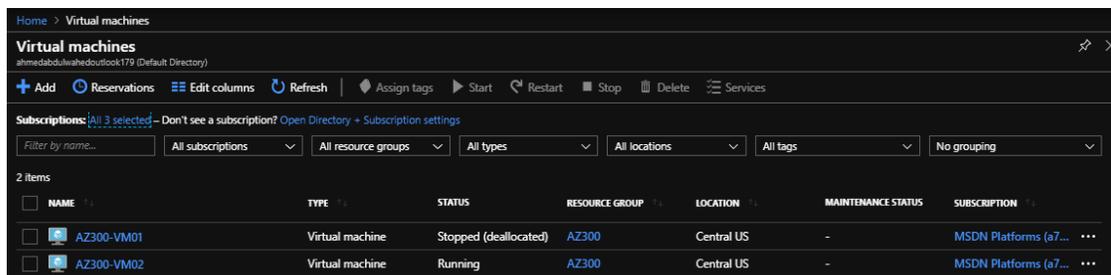
```
    "name": "RDP",
    "properties": {
      "priority": 360,
      "protocol": "TCP",
      "access": "Allow",
      "direction": "Inbound",
      "sourceAddressPrefix": "*",
      "sourcePortRange": "*",
      "destinationAddressPrefix": "*",
      "destinationPortRange": "3389"
    }
  }
]
subnetName      String      default
virtualNetworkName String    AZ300-vnet
addressPrefixes Array     [
  "10.0.0.0/24"
]
subnets        Array     [
  {
    "name": "default",
    "properties": {
      "addressPrefix": "10.0.0.0/24"
    }
  }
]
publicIpAddressName String    AZ300-VM02-ip
publicIpAddressType String    Dynamic
publicIpAddressSku String    Basic
virtualMachineName String    AZ300-VM02
virtualMachineRg String    AZ300
osDiskType       String    Standard_LRS
virtualMachineSize String    Standard_B1ms
adminUsername     String    aabelwahed
adminPassword     SecureString
autoShutdownStatus String    Enabled
autoShutdownTime String    19:00
autoShutdownTimeZone String    UTC
autoShutdownNotificationStatus String Disabled
autoShutdownNotificationLocale String en

Outputs
: {[adminUsername,
Microsoft.Azure.Commands.ResourceManager.Cmdlets.SdkModels.DeploymentVariable]}

OutputsString
:
=====
Name      Type      Value
-----
adminUsername String    aabelwahed
```

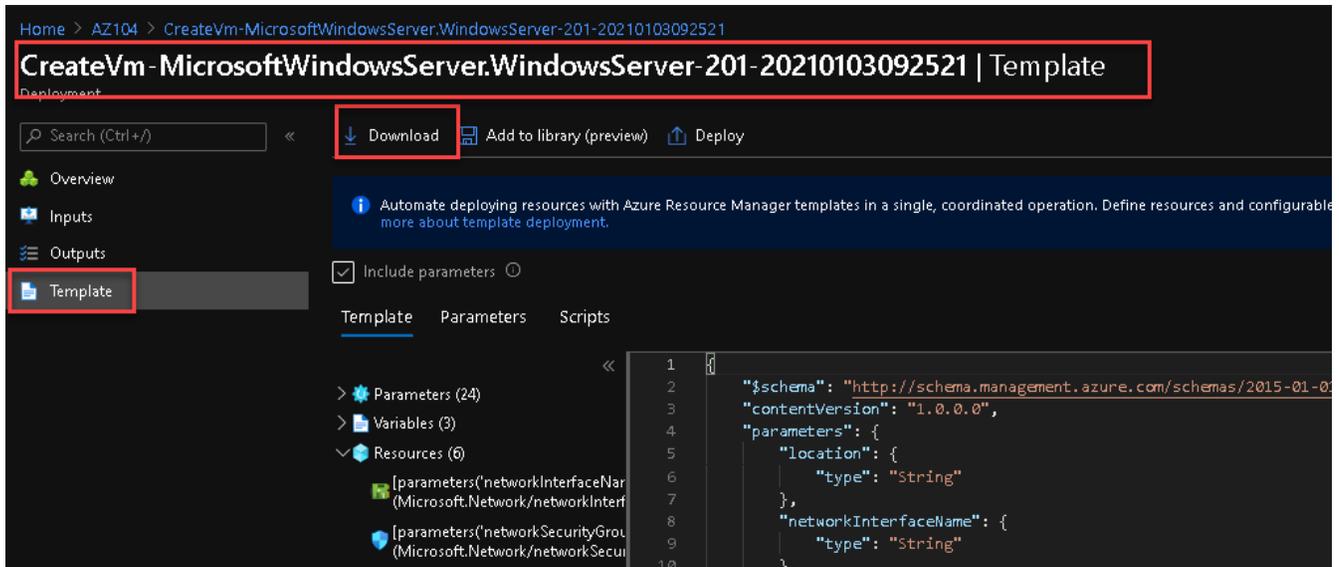
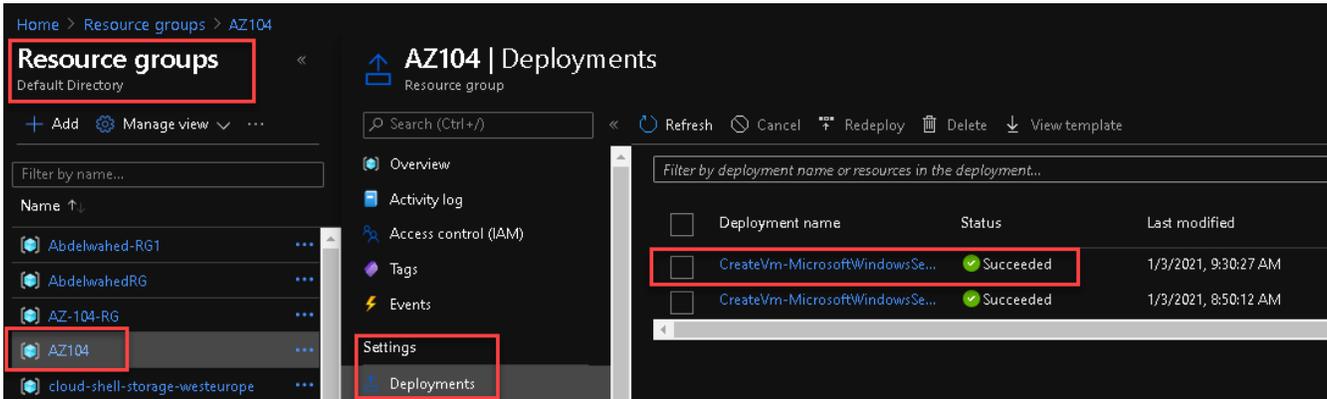


az vm image list --output table



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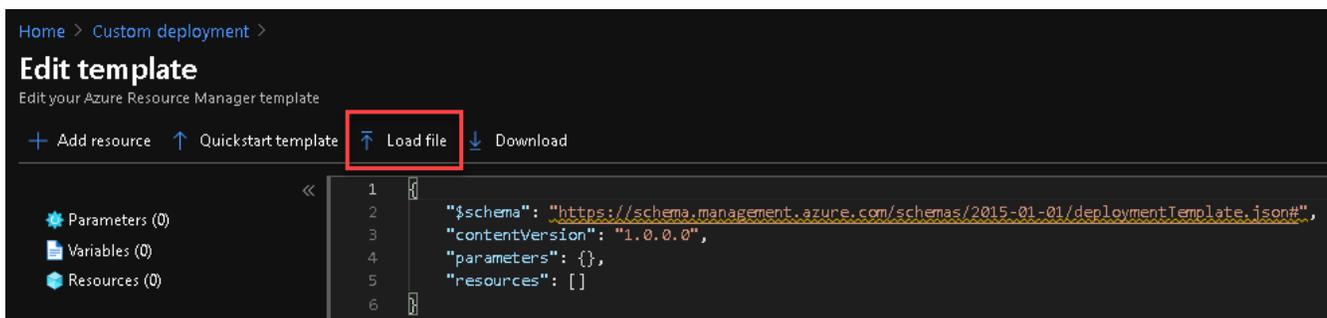
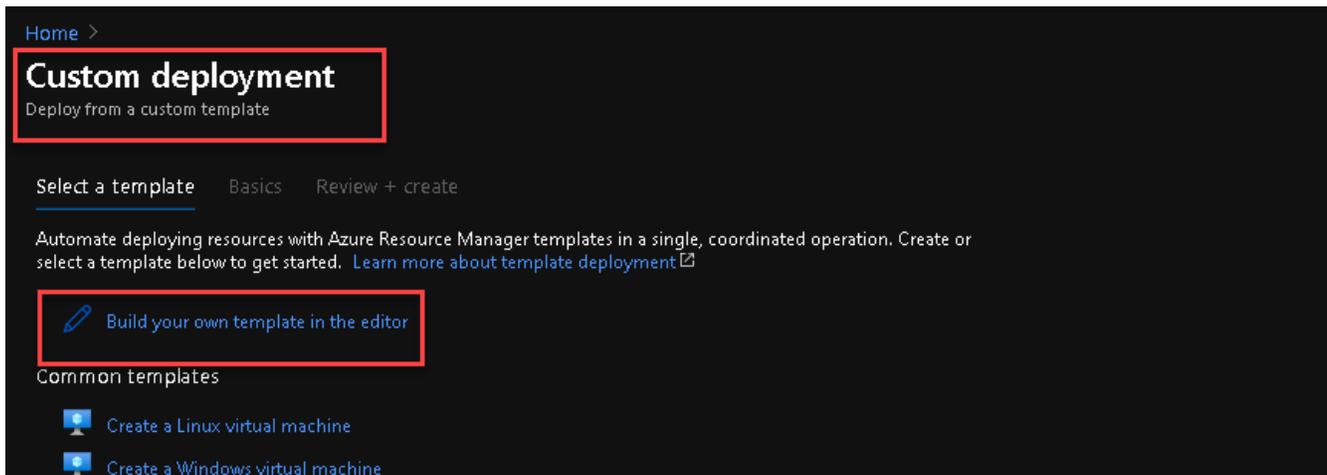
2- after deploy resource follow the instruction below



edit your Json file

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search for **Custom deployment** in azure portal



And upload the .Json file and edit it

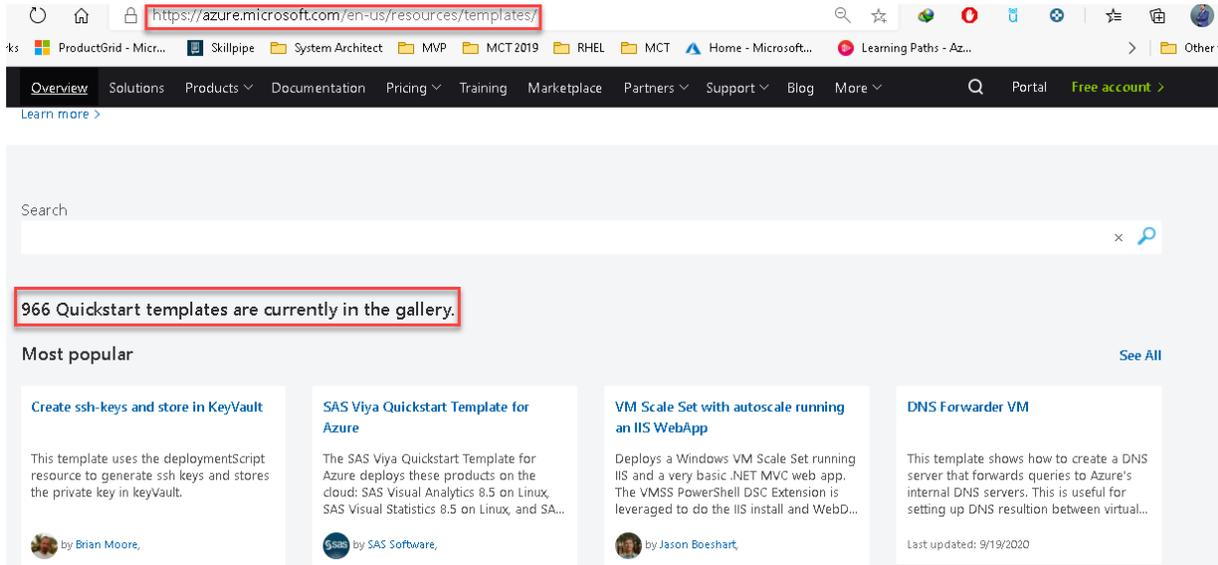
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3- Using QuickStart Templates

are Resource Manager templates provided by the Azure community?

[Azure Quickstart Templates \(microsoft.com\)](https://azure.microsoft.com/en-us/resources/templates/)

Select template



So, you can

```
PS C:\Users\Anand> New-AzResourceGroupDeployment -Name NewVmDeployment -ResourceGroupName Prod_IT -TemplateUri "C:\Users\Anand\Desktop\ARM_Templates\NewVM.json"

cmdlet New-AzResourceGroupDeployment at command pipeline position 1
Supply values for the following parameters:
(Type !? for Help.)
adminUsername:
```

deploy directly to azure

[Templates](#) / [Create a VM from Image Version](#)

Create a VM from Image Version



by Akshay Joshi

Last updated: 3/2/2020

[Deploy to Azure](#)

[Browse on GitHub](#)

This template allows you to create a Virtual Machines from an Image Version in a Shared Image Gallery. This template also deploys a Virtual Network, Public IP address Interface. Please ensure that you have created an Image Version using Image Version 101 Template first.

This Azure Resource Manager template was created by a member of the community and not by Microsoft. Each Resource Manager template is licensed to you under a license agreement by its own not responsible for Resource Manager templates provided and licensed by community members and does not screen for security, compatibility, or performance. Community Resource Manager templates under any Microsoft support program or service, and are made available AS IS without warranty of any kind.

Parameters

PARAMETER NAME	DESCRIPTION
----------------	-------------

www.abdelwahed.me

Templates / Create a VM from Image Version

Create a VM from Image Version

by Akshay Joshi
Last updated: 3/2/2020



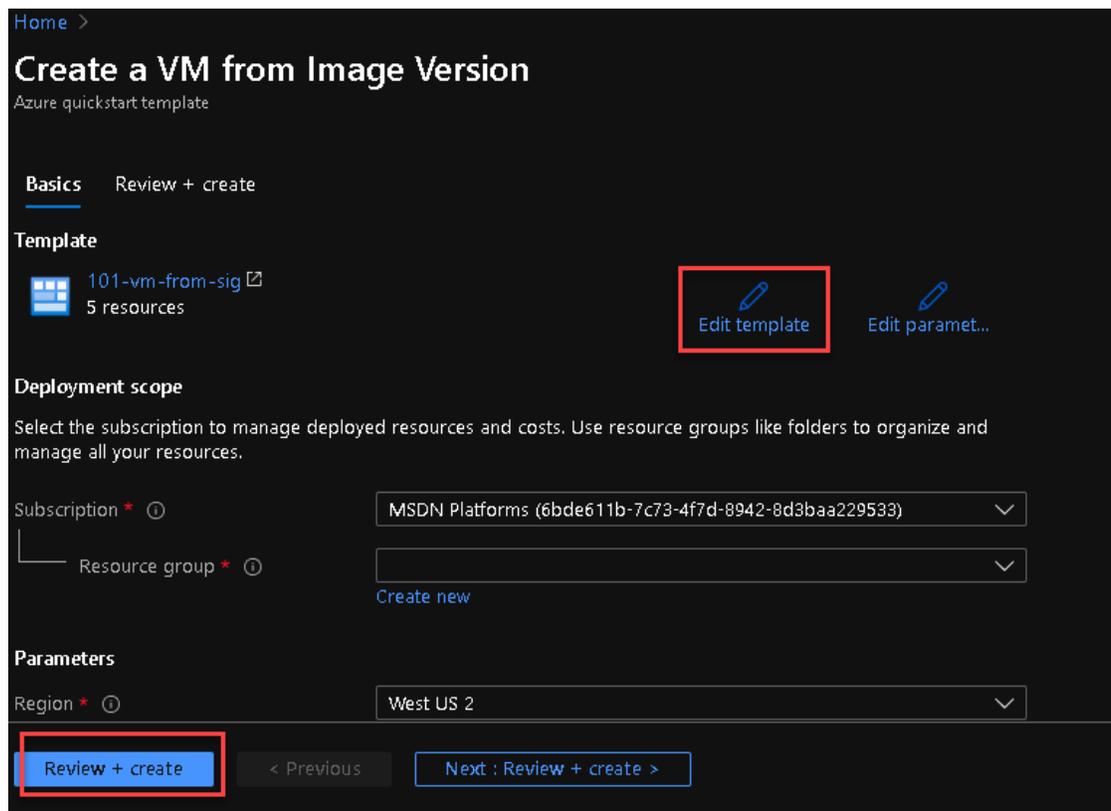
This template allows you to create a Virtual Machines from an Image Version in a Shared Image Gallery. This template also deploys a Interface. Please ensure that you have created an Image Version using Image Version 101 Template first.

This Azure Resource Manager template was created by a member of the community and not by Microsoft. Each Resource Manager template is licensed to you not responsible for Resource Manager templates provided and licensed by community members and does not screen for security, compatibility, or perform under any Microsoft support program or service, and are made available AS IS without warranty of any kind.

Parameters

PARAMETER NAME	DESCRIPTION
adminUsername	Username for the Virtual Machine.

Also, you can edit the selected template to meet your goal.



Intersite Connectivity

Virtual Network Peering – VNet Peering

You can connect virtual networks to each other with virtual network peering. Once virtual networks are peered, resources in both virtual networks can communicate with each other, with the same latency and bandwidth as if the resources were in the same virtual network.

Peering lab

Create 2 subnets inside one virtual network

Virtual network: 192.168.0.0/16

Subnet1: 192.168.10.0/24

Subnet2: 192.168.20.0/24

Now create 2 VMs:

VM1: is webserver1 connected to subnet1

VM2: is webserver2 connected to subnet2

Now test connectivity between both VMs (connected), this because the default NSG rule (check NSG rules)

There is default routing between all subnets in same VNet

There are two types of VNet peering.

- **Regional VNet peering** connects Azure virtual networks in the same region.
- **Global VNet peering** connects Azure virtual networks in different regions.

VNet1: 192.168.0.0/24

Subnet1: 192.168.10.0/24

Location: CentralUS

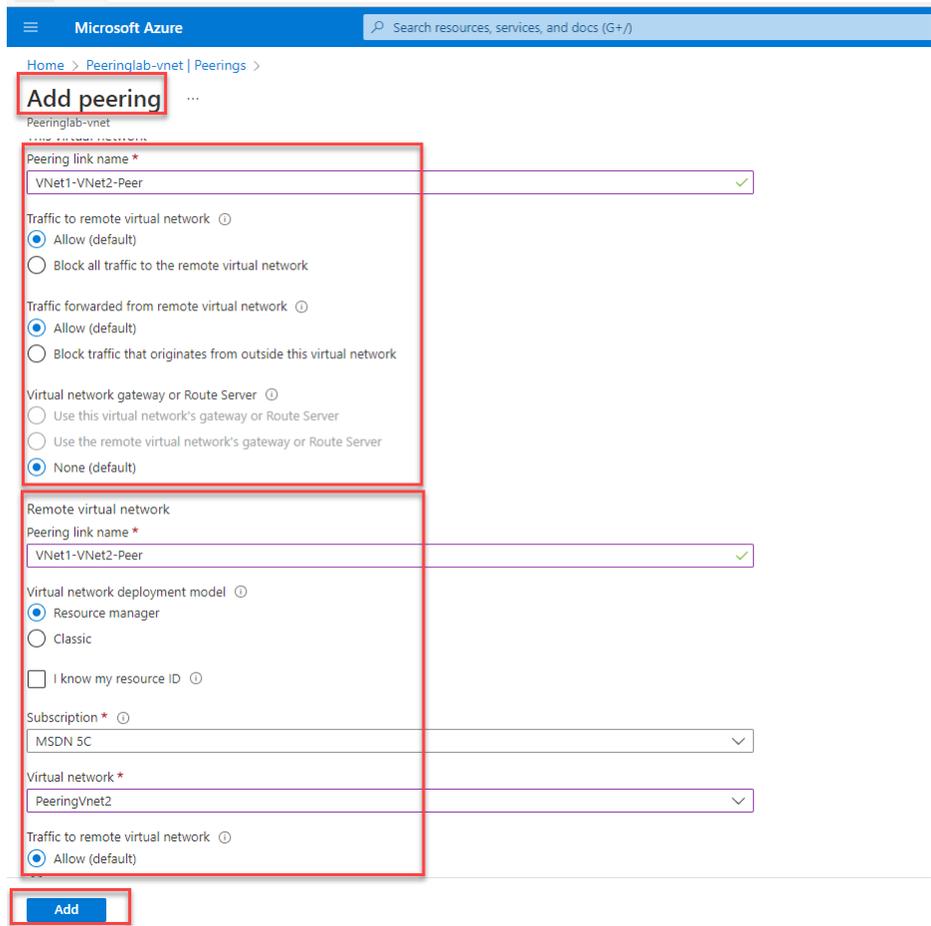
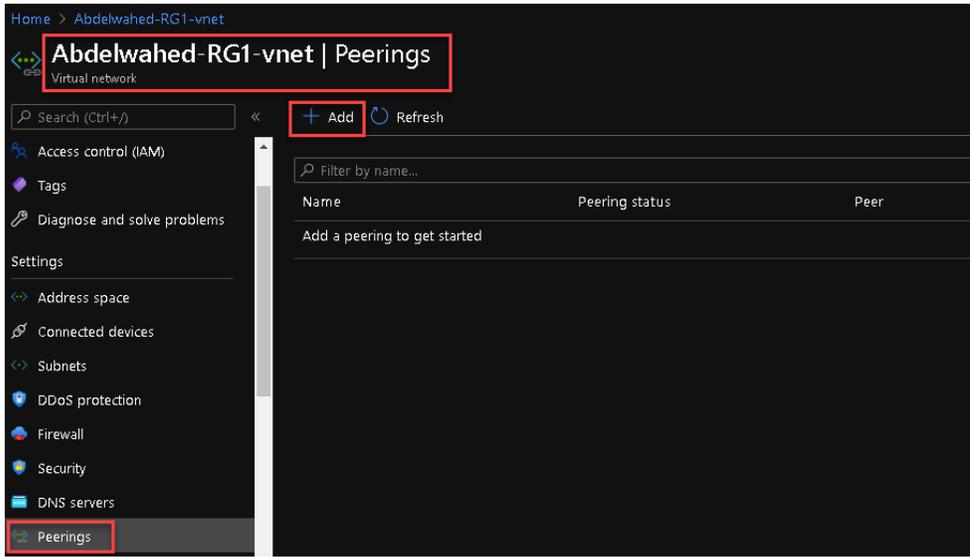
VNet2: 10.0.0.0/8

Subnet1: 10.0.0.0/8

Location: South Africa

You can connect these VNets using VNet peering as explained below

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Network Traffic Management

Network Routing

First, we will create firewall as a virtual appliance then we will learn how to route all traffic to it

Azure Firewall is a managed, cloud-based network security service that protects Azure Virtual Network resources. It is **Firewall as a Service** with built-in high availability and scalability.

With Azure Firewall, you can create, enforce, and log application and network connectivity policies. Static public IP addresses for your virtual network resources allow outside firewalls to identify traffic originating from your virtual network. The service is integrated with Azure Monitor for logging and analytics.

Configuring Azure Firewall

- Set up a network environment (Create Resource group, VNet and VM)
- Deploy a firewall
- Create a default route
- Configure RDP and internet through the firewall rules

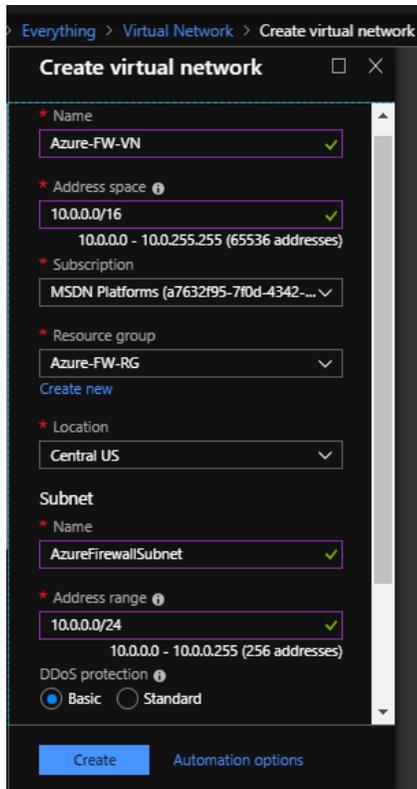
Create a resource group

The screenshot shows the 'Create a resource group' page in the Azure portal. The page is titled 'Create a resource group' and has a navigation bar with 'Basics', 'Tags', and 'Review + Create' tabs. The 'Basics' tab is selected. Below the tabs, there is a description of a resource group: 'Resource group - A container that holds related resources for an Azure solution. The resource group can include all the resources for the solution, or only those resources that you want to manage as a group. You decide how you want to allocate resources to resource groups based on what makes the most sense for your organization. [Learn more](#)'. Below this, there are two sections: 'PROJECT DETAILS' and 'RESOURCE DETAILS'. Under 'PROJECT DETAILS', there is a 'Subscription' field with a dropdown menu showing 'MSDN Platforms (a7632f95-7f0d-4342-adda-dbc286dbe45c)' and a 'Resource group' field with a dropdown menu showing 'Azure-FW-RG'. Under 'RESOURCE DETAILS', there is a 'Region' field with a dropdown menu showing 'Central US'.

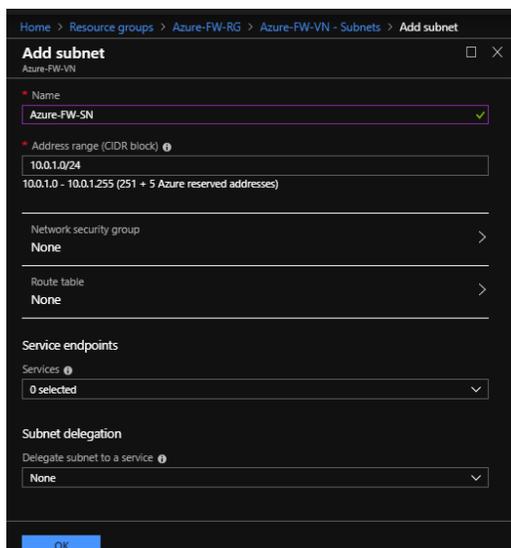
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Create a VNet

The minimum size of the AzureFirewallSubnet subnet is /26.



Create additional subnets to associate it with firewall



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NAME	ADDRESS RANGE	AVAILABLE ADDRESSES	SECURITY GROUP
AzureFirewallSubnet	10.0.0.0/24	251	-
Azure-FW-SN	10.0.1.0/24	251	-

Create virtual machines

Subscription: MSDN Platforms (a763295-7f0d-4342-adda-dbc286dbe45c)
Resource group: Azure-FW-RG

INSTANCE DETAILS

Virtual machine name: Azure-FW-VM
Region: Central US
Availability options: No infrastructure redundancy required
Image: Windows Server 2016 Datacenter
Size: Standard DS1 v2 (1 vcpu, 3.5 GB memory)

ADMINISTRATOR ACCOUNT

Username:
Password:
Review + create

Basics Disks **Networking** Management Guest config Tags Review + create

Define network connectivity for your virtual machine by configuring network interface card (NIC) settings. You can control ports, inbound and outbound connectivity with security group rules, or place behind an existing load balancing solution. [Learn more](#)

NETWORK INTERFACE

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

CONFIGURE VIRTUAL NETWORKS

Virtual network: Azure-FW-VN
Subnet: Azure-FW-SN (10.0.1.0/24)
Public IP: (new) Azure-FW-VM-PIP
NIC network security group: None Basic Advanced
Public inbound ports: None Allow selected ports
Select inbound ports: RDP, HTTP, HTTPS

Review + create Previous Next: Management >

Note the private IP address. You'll use it later when you create the default route.

Deploy the firewall

Home > Resource groups > Azure-FW-RG > Everything > Firewall > Create a firewall

Create a firewall

PROJECT DETAILS

Subscription: MSDN Platforms (a763295-7f0d-4342-adda-dbc286dbe45c)
Resource group: Azure-FW-RG

INSTANCE DETAILS

Name: Azure-FW
Region: Central US
Choose a virtual network: Create new Use existing
Virtual network: Azure-FW-VN (Azure-FW-RG)

PUBLIC IP ADDRESS

Public IP address: Create new Use existing
Public IP address name: AzureFirewalls-PIP
Public IP address SKU: Standard

Review + create Previous Next: Tags > Download a template for automation

Create a firewall

Basics Tags **Review + create**

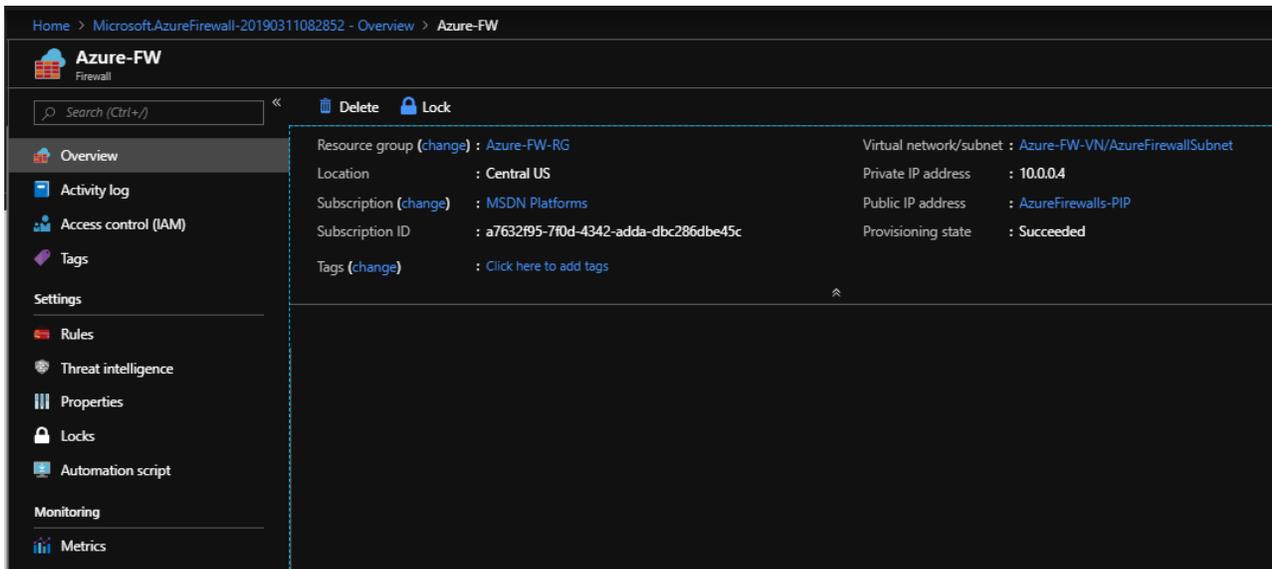
Summary

Basics

Subscription	MSDN Platforms
Resource group	Azure-FW-RG
Region	Central US
Virtual network	Azure-FW-VN
Address space	10.0.0.0/16
Public IP address	AzureFirewalls-PIP

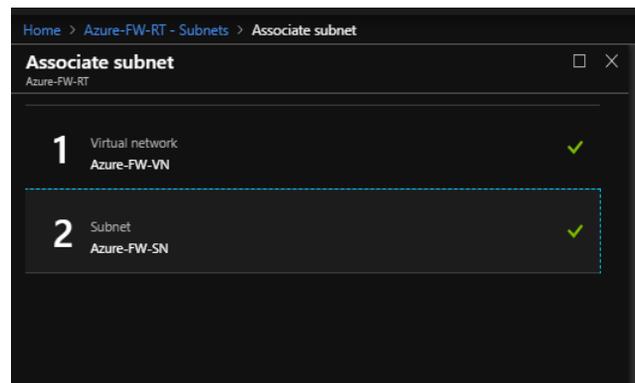
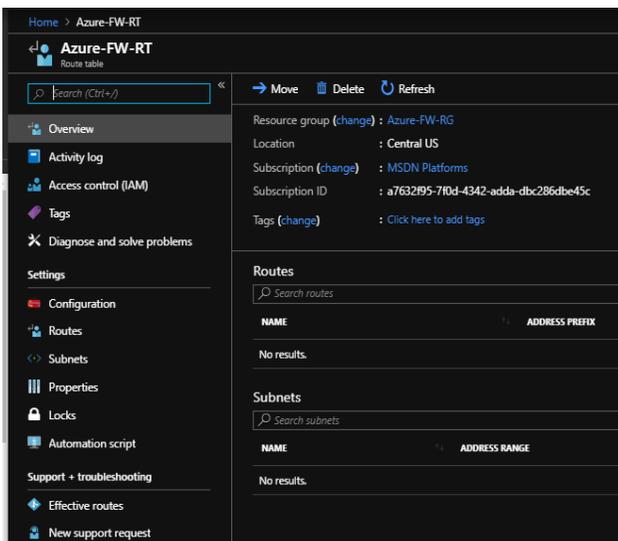
Create Previous Next Download a template for automation

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Create a default route

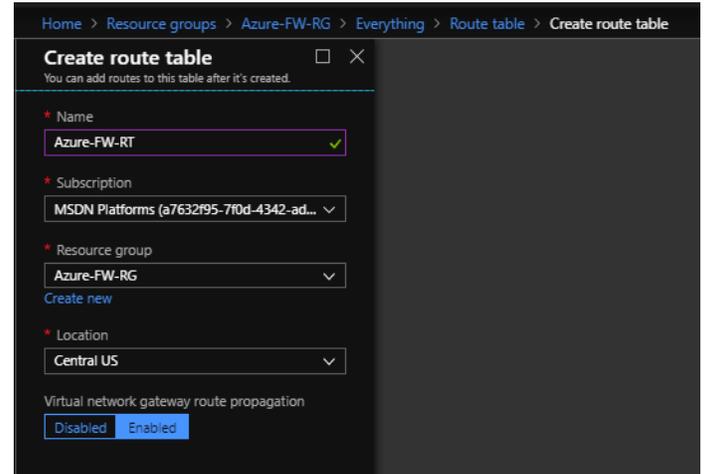
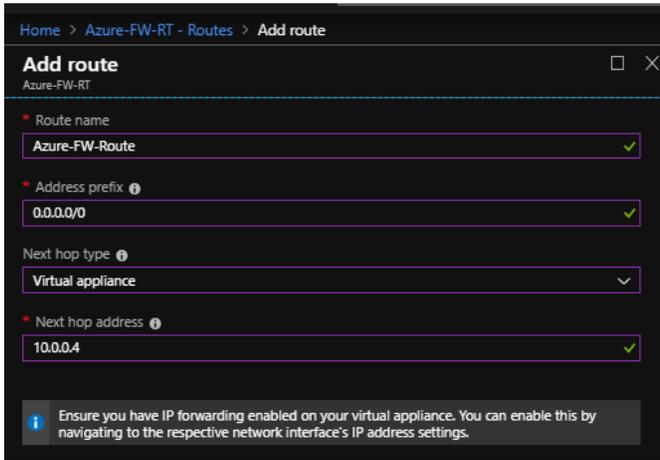
From all services search for route table and after create Click **Refresh** then Click **Subnets** > **Associate**



Now all incoming traffic will be forwarded to the firewall, so now you can allow or deny network traffic coming to that subnet.

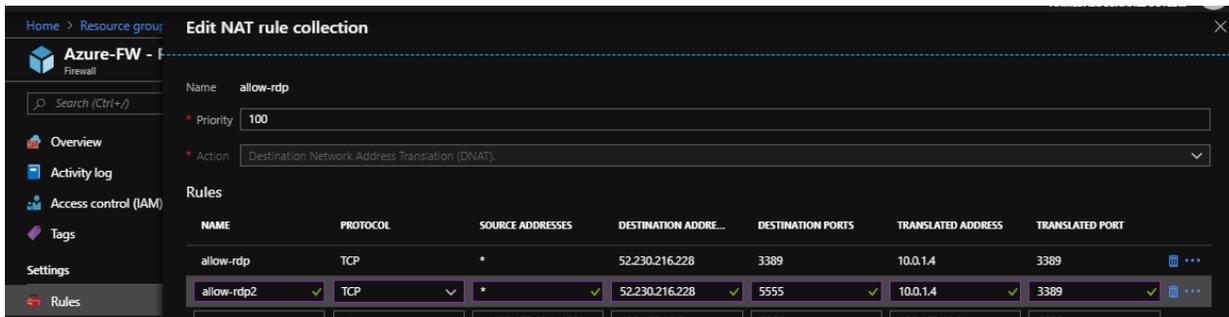
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Click **Routes > Add**.

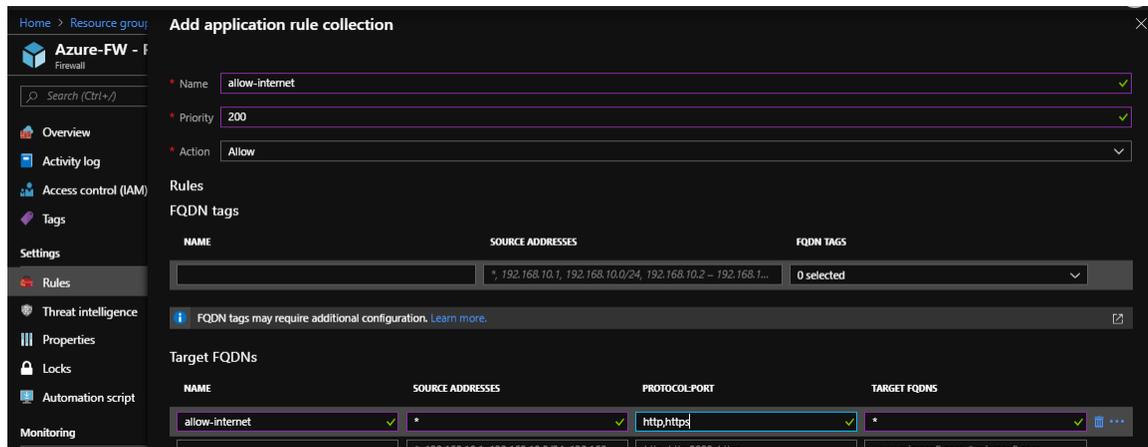


Configure an application rule

From firewall under setting select Rules, in this lab allows incoming RDP. Also change rdp port from 3389 to 5555



also internet is blocked, so we have to allow http and https traffic.



Network Routing and Endpoints

System Routes

Azure uses **system routes** to direct network traffic between virtual machines, on-premises networks, and the Internet. The following situations are managed by these system routes:

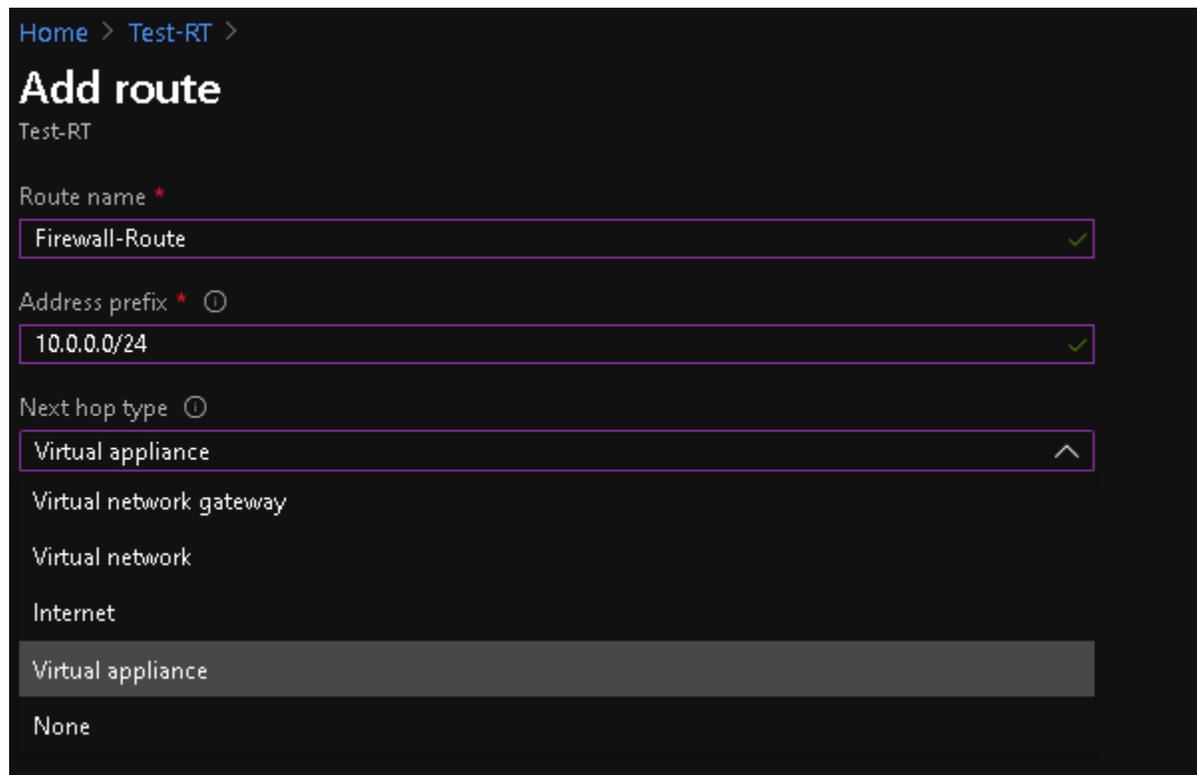
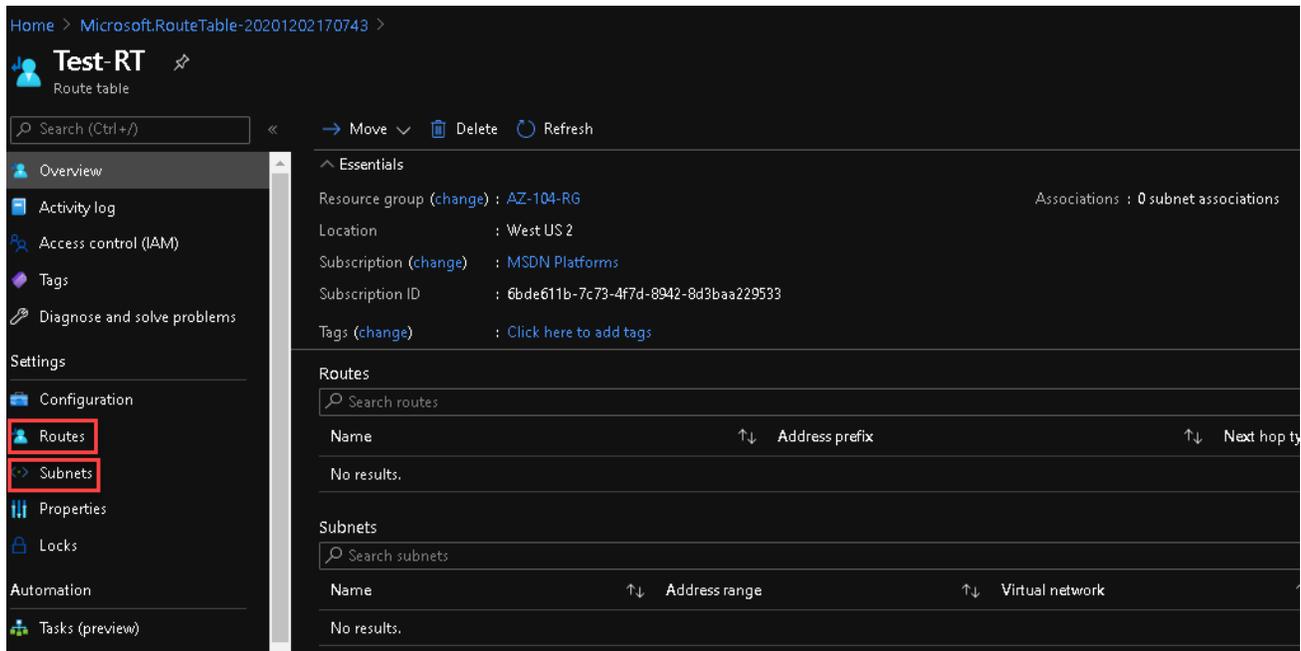
- Traffic between VMs in the same subnet.
- Between VMs in different subnets in the same virtual network.
- Data flow from VMs to the Internet.
- Site-to-Site and ExpressRoute communication through the VPN gateway.

Creating User defined Route

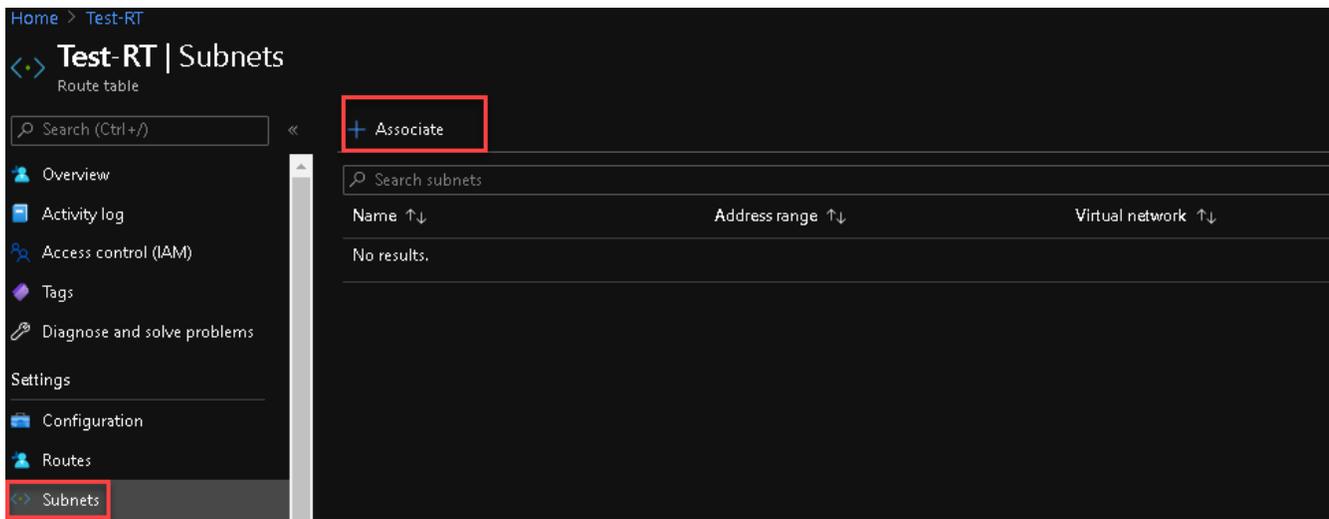
- 1- First create the routing table
- 2- Create routes

The screenshot shows the 'Create Route table' page in the Azure portal. The breadcrumb navigation at the top reads 'Home > Route tables >'. The main heading 'Create Route table' is highlighted with a red box. Below the heading are three tabs: 'Basics', 'Tags', and 'Review + create', with 'Basics' being the active tab. The 'Project details' section includes a description and two dropdown menus: 'Subscription' (MSDN Platforms (6bde611b-...)) and 'Resource group' ((New) AZ-104-RG). The 'Instance details' section includes a 'Region' dropdown (West US 2), a 'Name' dropdown (Test-RT) which is highlighted with a red box, and 'Propagate gateway routes' radio buttons (Yes and No, with 'No' selected). At the bottom, there are three buttons: 'Review + create', '< Previous', and 'Next : Tags >'.

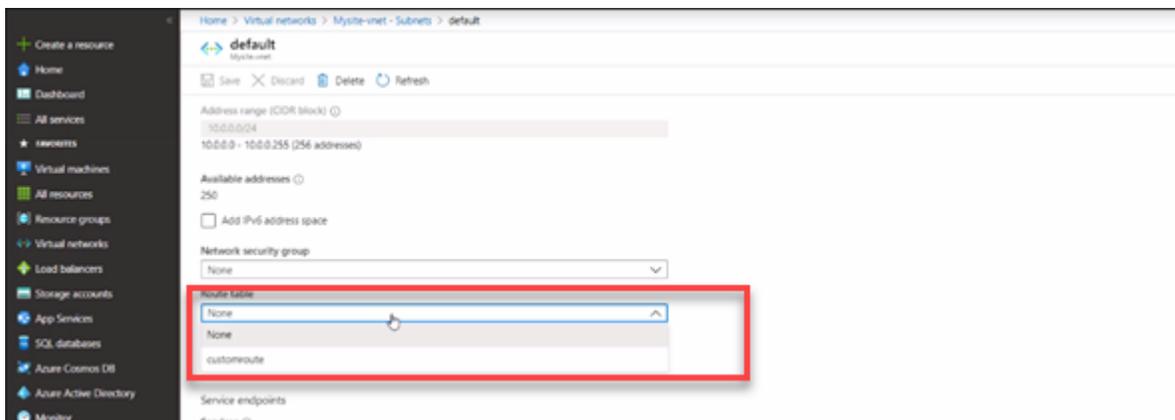
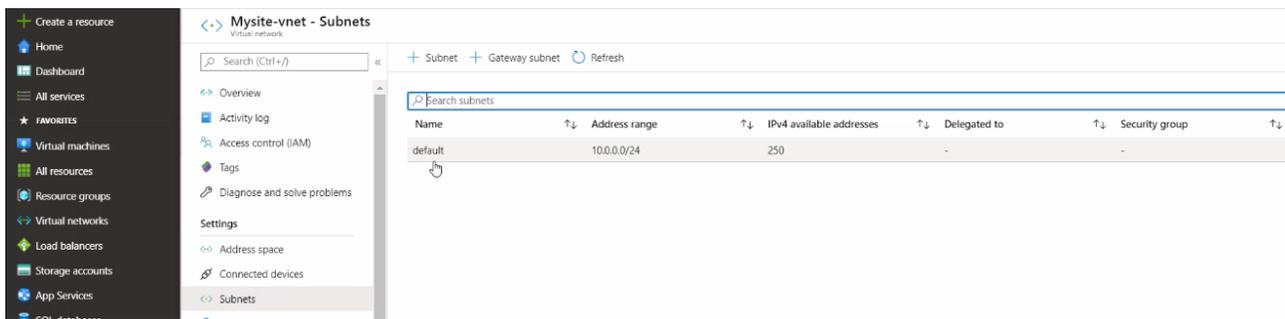
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Azure Administrator (AZ-104) | Lab Guide



or from VNet select subnet you want to associate to the new custom route



Azure Load Balancers

Create 3 VMs to host web server

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

Create a virtual machine ...

i Based on the number of availability zones selected, 3 virtual machines will be created. The following settings will be applied to each virtual machine unless specified otherwise.

Basics | Disks | Networking | Management | Monitoring | 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 *

Resource group *
[Create new](#)

Instance details

Virtual machine names
i 3 virtual machines will be created with the names shown above. [Edit names](#)

Region *

Availability options

Availability zone *
i Based on your zone selection, we will place 3 virtual machines, one in each selected zone. It is highly recommended to place them behind a load balancing solution to make your configuration resilient. You can do this in the 'Networking' tab

Security type

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

VM architecture Arm64
 x64
i Arm64 is not supported with the selected image.

Run with Azure Spot discount

Size *
[See all sizes](#)

Azure Administrator (AZ-104) | Lab Guide

Administrator account

Username * ⓘ ✓

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 * ✓

⚠ 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.

Basics **Disks** Networking Management Monitoring 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 * ⓘ ✓

If performance is critical for your workloads, choose Premium SSD disks for lower latency, higher IOPS and bandwidth, and bursting. [Learn more](#)

Delete with VM ⓘ

Enable encryption at host ⓘ

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

Encryption type * ✓

Enable Ultra Disk compatibility ⓘ
Ultra disk is not supported for the selected VM size Standard_DS2_v2 in Central US.

Azure Administrator (AZ-104) | Lab Guide

Basics Disks **Networking** Management Monitoring Advanced Tags Review + create

Define network connectivity for your virtual machine by configuring network interface card (NIC) settings. You can control ports, inbound and outbound connectivity with security group rules, or place behind an existing load balancing solution. [Learn more](#)

Network interface

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

Virtual network * ⓘ

Subnet * ⓘ

Public IP ⓘ
 ⓘ 3 public IPs will be created with the names shown above.

NIC network security group ⓘ None Basic Advanced

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](#)

Load balancing options ⓘ None Azure load balancer Application gateway
Supports all TCP/UDP network traffic, port-forwarding, and outbound flows.
Web traffic load balancer for HTTP/HTTPS with URL-based routing, SSL termination, session persistence, and web application firewall.

Select a load balancer * ⓘ

Create a load balancer



Load balancer name *

Type * ⓘ

Public
Provides outbound connections for virtual machines inside your virtual network using public load balancers.

Internal
Used to load balance traffic inside a virtual network. A load balancer frontend can be accessed from an on-premises network in a hybrid scenario.

Protocol * ⓘ

TCP

UDP

Rules

- Rules
- Load balancer rule
 - Inbound NAT rule

Load balancer rule

A load balancing rule distributes incoming traffic that is sent to a selected IP address and port combination across a group of backend pool instances. Only backend instances that the health probe considers healthy receive new traffic.

Port * ⓘ

Backend port * ⓘ

Inbound NAT rule

An inbound NAT rule forwards incoming traffic sent to a selected IP address and port combination to a specific virtual machine.

Frontend port range start * ⓘ

Backend port * ⓘ

Azure Administrator (AZ-104) | Lab Guide

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](#)

Load balancing options None
 Azure load balancer
Supports all TCP/UDP network traffic, port-forwarding, and outbound flows.
 Application gateway
Web traffic load balancer for HTTP/HTTPS with URL-based routing, SSL termination, session persistence, and web application firewall.

Select a load balancer *
[Create a load balancer](#)

[Review + create](#)

< Previous

Next : Management >

Virtual machines

Default Directory (ahmedabdulwahedoutlook179.onmicrosoft.com)

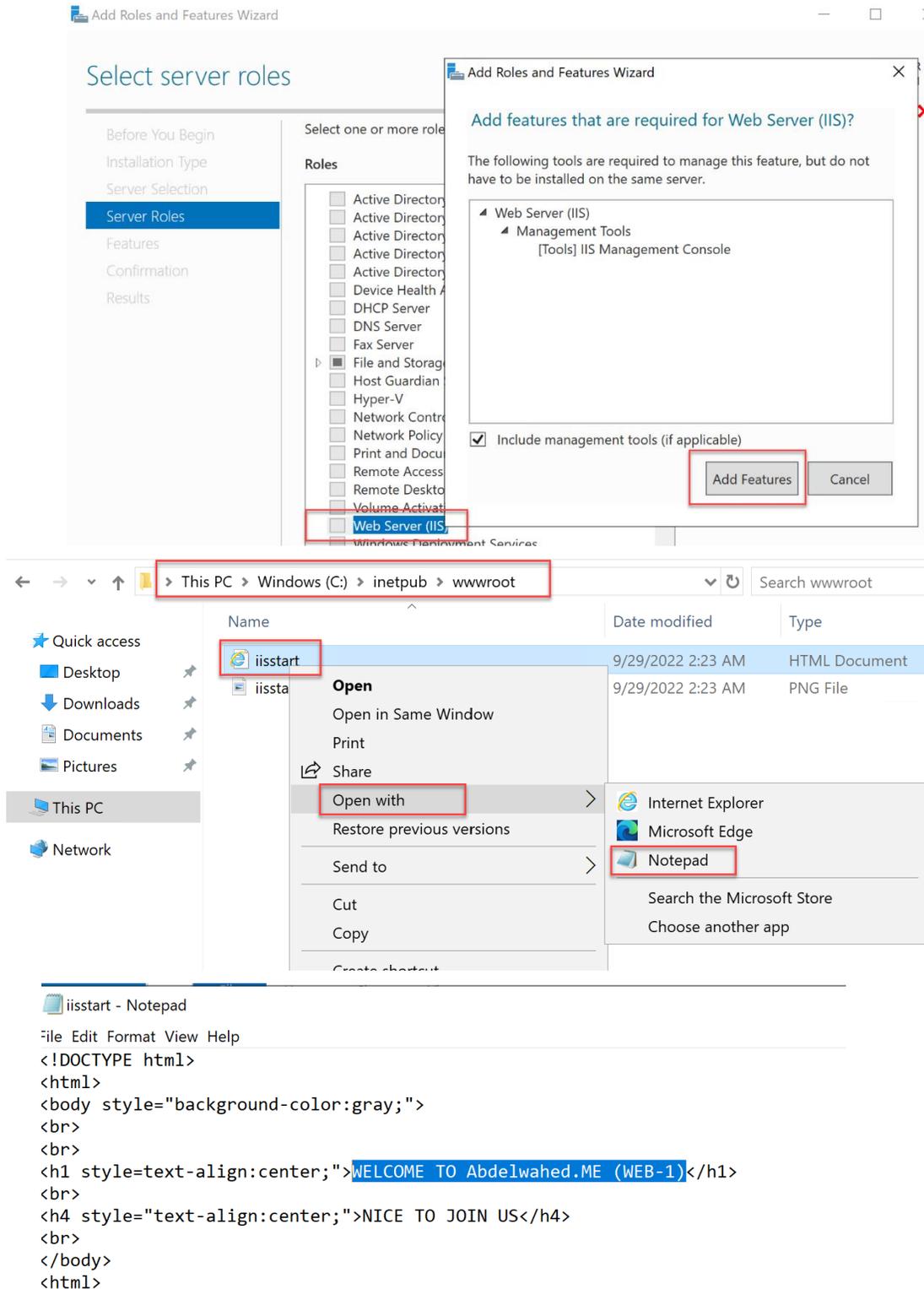
+ Create Switch to classic Reservations Manage view Refresh Export to CSV Open query Assign tags

Filter for any field... Subscription equals all Type equals all Resource group equals all Location equals all Add filter

<input type="checkbox"/>	Name ↑↓	Type ↑↓	Subscription ↑↓	Resource group ↑↓	Location ↑↓	Status ↑↓
<input type="checkbox"/>	 web-1	Virtual machine	MSDN 5C	LBLabs	Central US	Running
<input type="checkbox"/>	 web-2	Virtual machine	MSDN 5C	LBLabs	Central US	Running
<input type="checkbox"/>	 web-3	Virtual machine	MSDN 5C	LBLabs	Central US	Running

Azure Administrator (AZ-104) | Lab Guide

Now, access each server to add and configure web server (iis) using default installation settings.



Azure Administrator (AZ-104) | Lab Guide

Using Load balancer public IP address, you can access web service in these 3 servers

Home > Load balancing | Load Balancer > Ahmed-LB01

Ahmed-LB01 | Frontend IP configuration

Search

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems

Settings

- Frontend IP configuration
- Backend pools

Filter by name...

Name	IP address
Ahmed-LB01-frontendconfig01	20.221.117.223 (Ahmed-LB01-publicip)

Home > Load balancing | Load Balancer > Ahmed-LB01

Ahmed-LB01 | Backend pools

Search

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems

Settings

- Frontend IP configuration
- Backend pools
- Health probes
- Load balancing rules
- Inbound NAT rules

Filter by name...

Backend pool == all Resource Name == all Resource Status == all IP address == all Network interface == all Availability zone == all

Group by Backend pool

Backend pool	Resource Name	Resource Status	IP address	Network interface	Availability zone
Ahmed-LB01-backendpool01					
Ahmed-LB01-backendpool...	web-1	Running	10.2.0.4	web-117_z1	1
Ahmed-LB01-backendpool...	web-3	Running	10.2.0.5	web-1478_z3	3
Ahmed-LB01-backendpool...	web-2	Running	10.2.0.6	web-1779_z2	2

Not secure | 20.221.117.223

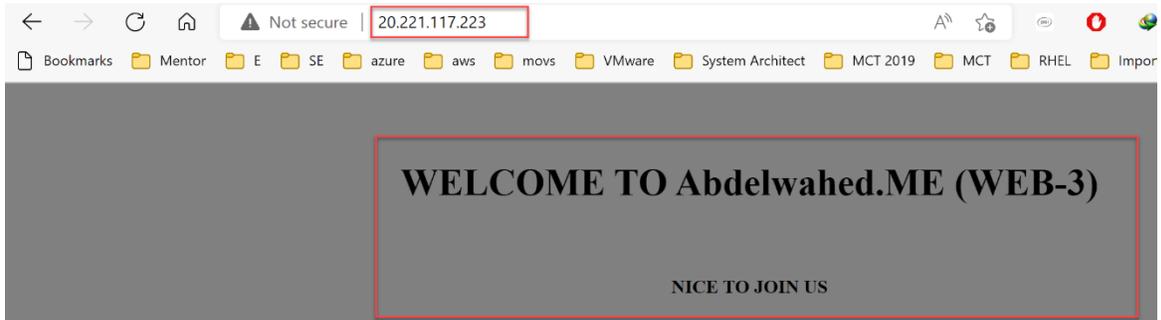
Bookmarks: Mentor, E, SE, azure, aws, movs, VMware, System Architect, MCT 2019, MCT, RHEL, Im

WELCOME TO Abdelwahed.ME (WEB-2)

NICE TO JOIN US

Azure Administrator (AZ-104) | Lab Guide

To test load balancer refresh or shutdown web-2 and try to access using load balancer IP address



Azure Storage

Azure Storage is a service that you can use to store files, messages, tables, and other types of information. You can use Azure storage on its own—for example as a file share—but it is often used by developers as a store for working data. Such stores can be used by websites, mobile apps, desktop applications, and many other types of custom solutions. Azure storage is also used by IaaS virtual machines, and PaaS cloud services. You can generally think of Azure storage in three categories.

Storage for Virtual Machines

This includes disks and files. Disks are persistent block storage for Azure IaaS virtual machines. Files are fully managed file shares in the cloud.

Unstructured Data

This includes Blobs and Data Lake Store. Blobs are highly scalable, REST based cloud object store. Data Lake Store is Hadoop Distributed File System (HDFS) as a service.

Structured Data

This includes Tables, Cosmos DB, and Azure SQL DB. Tables are a key/value, auto-scaling NoSQL store. Cosmos DB is a globally distributed database service. Azure SQL DB is a fully managed database-as-a-service built on SQL.

Creating an Azure Storage account

[Home](#) > [Storage accounts](#) >

Create a storage account ...

Basics | [Advanced](#) | [Networking](#) | [Data protection](#) | [Encryption](#) | [Tags](#) | [Review](#)

Resource group * [Create new](#)

Instance details

If you need to create a legacy storage account type, please click [here](#).

Storage account name *

Region *

Performance * **Standard:** Recommended for most scenarios (general-purpose v2 account)

Premium: Recommended for scenarios that require low latency.

Redundancy *

Make read access to data available in the event of regional unavailability.

[Review](#)

[< Previous](#)

[Next : Advanced >](#)

Home > Storage accounts >

Create a storage account ...

Basics Advanced **Networking** Data protection Encryption Tags Review

Network connectivity

You can connect to your storage account either publicly, via public IP addresses or service endpoints, or privately, using a private endpoint.

Network access *

- Enable public access from all networks
 - Enable public access from selected virtual networks and IP addresses
 - Disable public access and use private access
- i** Enabling public access from all networks might make this resource available publicly. Unless public access is required, we recommend using a more restricted access type. [Learn more](#)

Create a storage account ...

Basics Advanced Networking **Data protection** Encryption Tags Review

- Enable soft delete for blobs
Soft delete enables you to recover blobs that were previously marked for deletion, including blobs that were overwritten. [Learn more](#)
Days to retain deleted blobs ⓘ
- Enable soft delete for containers
Soft delete enables you to recover containers that were previously marked for deletion. [Learn more](#)
Days to retain deleted containers ⓘ
- Enable soft delete for file shares
Soft delete enables you to recover file shares that were previously marked for deletion. [Learn more](#)
Days to retain deleted file shares ⓘ

Tracking

Manage versions and keep track of changes made to your blob data.

- Enable versioning for blobs
Use versioning to automatically maintain previous versions of your blobs. [Learn more](#)

Review

< Previous

Next : Encryption >

Azure Administrator (AZ-104) | Lab Guide

Home > Storage accounts > ohist01 Storage account

Search

Upload Open in Explorer Delete Move Refresh Open in mobile Feedback

Overview

- Activity log
- Tags
- Diagnose and solve problems
- Access Control (IAM)
- Data migration
- Events
- Storage browser

Data storage

- Containers
- File shares
- Queues
- Tables

Security + networking

- Networking
- Azure CDN

Essentials

Resource group (move) : StorageRG Performance : Standard

Location : East US Replication : Read-access geo-redundant storage (RA-GRS)

Primary/Secondary Location : Primary: East US, Secondary: West US Account kind : StorageV2 (general purpose v2)

Subscription (move) : MSDN SC Provisioning state : Succeeded

Subscription ID : a7632f95-7f0d-4342-adda-dbc286dbe45c Created : 9/29/2022, 9:00:34 AM

Disk state : Primary: Available, Secondary: Available

Tags (edit) : Click here to add tags

Properties Monitoring Capabilities (7) Recommendations Tutorials Developer Tools

Blob service

- Hierarchical namespace Disabled
- Default access tier Hot
- Blob public access Enabled
- Blob soft delete Disabled
- Container soft delete Disabled
- Versioning Disabled
- Change feed Disabled
- NFS v2 Disabled

Security

- Require secure transfer for REST API operations Enabled
- Storage account key access Enabled
- Minimum TLS version Version 1.2
- Infrastructure encryption Disabled

Networking

- Allow access from All networks

Create Container and File Share

Home > ohist01 Containers Storage account

Search

+ Container Change access level Restore containers Refresh Delete

Search containers by prefix Show deleted containers

Name	Last modified	Public access level	Lease state
<input type="checkbox"/> \$logs	9/29/2022, 9:00:59 AM	Private	Available
<input type="checkbox"/> ahmed-container	9/29/2022, 9:03:56 AM	Container	Available

Containers

File shares

Queues

Tables

Home > Storage accounts > ohist01 | File shares > archive-data

archive-data | Properties

Search

- Overview
- Diagnose and solve problems
- Access Control (IAM)

Settings

Properties

Operations

- Snapshots
- Backup

NAME

archive-data

URL

https://ohist01.file.core.windows.net/archive-data

LAST MODIFIED

9/29/2022, 9:12:50 AM

ETAG

0x8DAA1D94172E4DF

QUOTA

100 GiB

USAGE

472.61 KiB

TIER

Cool

Map Network Drive

What network folder would you like to map?

Specify the drive letter for the connection and the folder that you want to connect to:

Drive:

Z:

Folder:

\\ohist01.file.core.windows.net/archive-data

Browse...

Example: \\server\share

Reconnect at sign-in

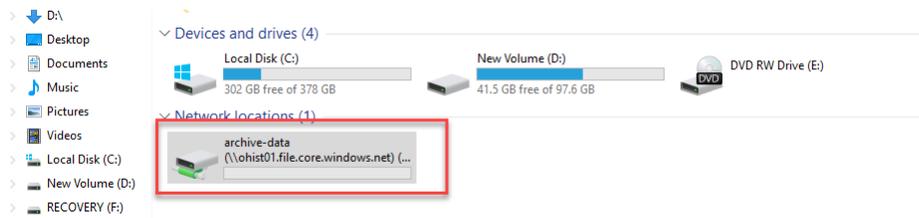
Connect using different credentials

[Connect to a Web site that you can use to store your documents and pictures.](#)

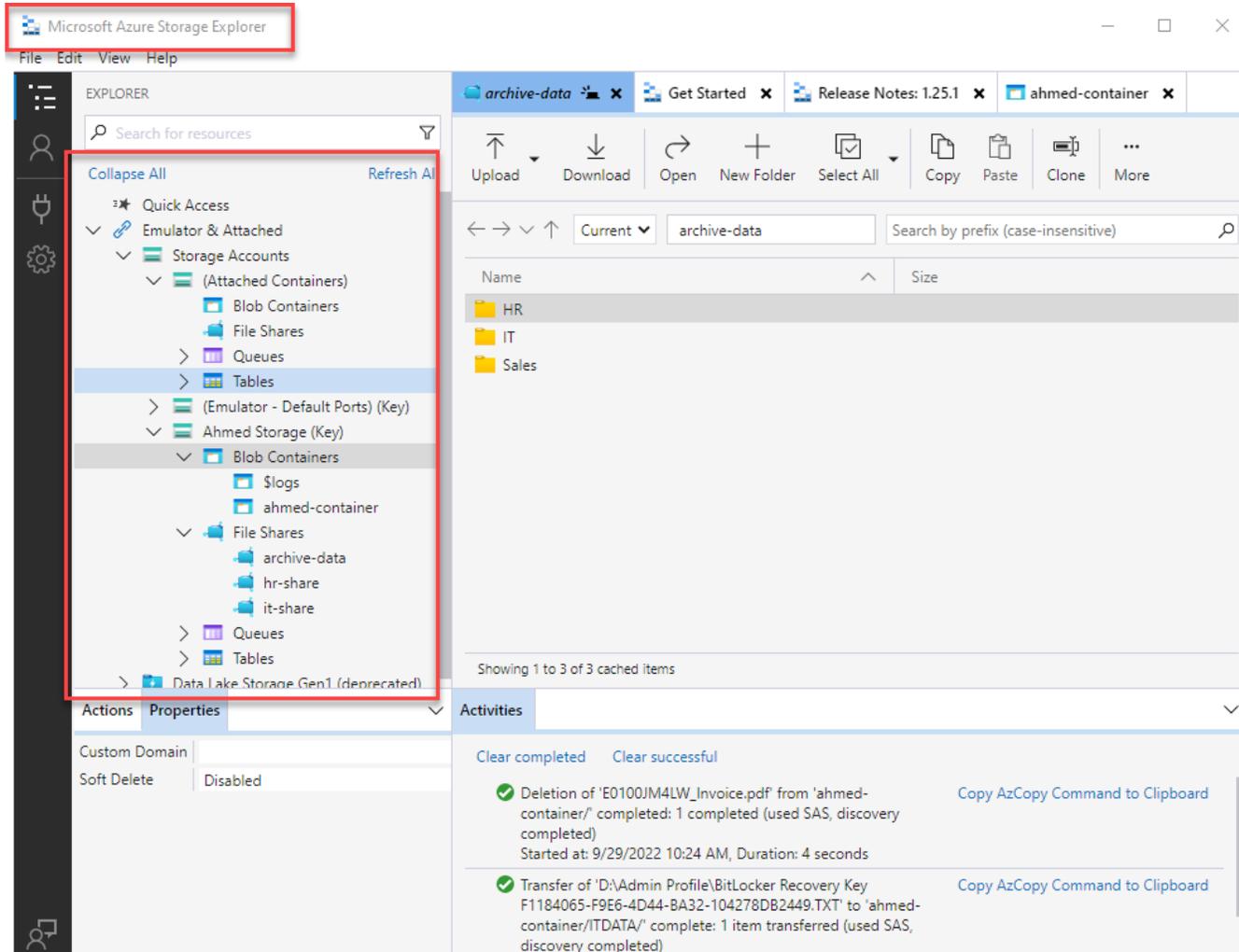
Finish

Cancel

Azure Administrator (AZ-104) | Lab Guide



Access all storage account items using Microsoft storage explorer



Data Protection

Backup Azure VMs

We have to create recovery service vault

[Home](#) > [Recovery Services vaults](#) >

Create Recovery Services vault

*** Basics** Tags Review + create

Project Details

Select the subscription and the resource group in which you want to create the vault.

Subscription * ⓘ	<input type="text" value="MSDN 5C"/>
Resource group * ⓘ	<input type="text" value="LBLabs"/>

[Create new](#)

Instance Details

Vault name * ⓘ	<input type="text" value="AhmedRSV"/>
Region * ⓘ	<input type="text" value="Central US"/>

Review + create

Next: Tags

Azure Administrator (AZ-104) | Lab Guide

Go for properties to check vault configuration

AhmedRSV
Recovery Services vault

Search

Backup Enable Site Recovery Delete Refresh Feedback

For backups, try our new Backup Center. It offers Azure Backup customers a unified view of Recovery Services Vaults used for backup in Azure. It also has new governance capabilities. Click here to get the new experience.

Essentials

Overview Backup Site Recovery

What's new

- Azure Backup Metrics are now in public preview →
- Multi-user authorization for Azure Backup is now generally available →
- Multiple backups a day for Azure Files is now in public preview →
- Enhanced experience for archive is now generally available →
- Backup for Azure Managed Disk is now Generally Available →
- A new and improved way to enable Azure Site Recovery on your VMware machines is in public preview →

Backup Site Recovery

Home > Microsoft.RecoveryServicesV2-1664425538893 | Overview > AhmedRSV

AhmedRSV | Properties
Recovery Services vault

Search

Multi-User Authorization for Backup is now generally available. Click here to configure. →

Resource group
LBLabs

Diagnostics Settings
Update

BACKUP

Backup Configuration
Update

Encryption Settings
Update

Multi-User Authorization
Update

Security Settings
Update

Backup Configuration

Save Discard

Storage replication type
Locally-redundant Zone-redundant **Geo-redundant**

This option cannot be changed after protecting items. Geo-Redundant Storage (GRS) provides a higher level of data availability than Zonal-Redundant Storage and Local-Redundant Storage. Zonal-Redundant Storage helps to replicate the data in the availability zones of the same region. Review the trade-offs between lower cost and higher cost availability [here](#).

Cross Region Restore
Enable **Disable**

Note:

- This allows you to **restore in the secondary region** for both BCDR drills and outage scenarios.
- This is **available for Azure Virtual Machines** and SQL/SAP HANA databases running inside Azure VMs in this vault. No support for classic VMs.
- Cross Region Restore is currently **non-reversible** storage property.

Learn more about [Cross Region Restore](#) and [pricing impact](#).

Azure Administrator (AZ-104) | Lab Guide

Home > Microsoft.RecoveryServicesV2-1664425538893 | Overview > AhmedRSV

AhmedRSV | Properties ☆ ...
Recovery Services vault

Search

Multi-User Authorization for Backup is now generally available. Click here to configure. →

Resource group: LBLabs

Diagnostics Settings: Update

BACKUP

Backup Configuration: Update

Encryption Settings: Update

Multi-User Authorization: Update

Security Settings: Update

Security Settings
AhmedRSV

Save Discard

If you have enabled [Azure multi-factor authentication](#), you will be required to additionally authenticate using another device (for example, a mobile phone) while signing in to the Azure portal.

Soft Delete (For workloads running in Azure)
Enable this setting to protect backup data for Azure VM, SQL Server in Azure VM and SAP HANA in Azure VM from accidental deletes. [Learn More](#)

Enabled Disable

Security Features (For workloads running on-premises)
Enable this setting to protect hybrid backups against accidental deletes and add additional layer of authentication for critical operations. Refer [this link](#) for minimum agent version requirement to enable this setting. [Learn more](#).

Enabled Disable

Start VM backup

AhmedRSV | Backup ...
Recovery Services vault

Search

The storage replication is set to Geo-Redundant. This option cannot be changed later. Before proceeding further, click here. →

Where is your workload running?
Azure

What do you want to backup?
Virtual machine

Step: Configure Backup

Backup

Backup

Azure Administrator (AZ-104) | Lab Guide

Home > Microsoft.RecoveryServicesV2-1664425538893 | Overview > AhmedRSV | Backup >

Configure Backup

AhmedRSV

Policy sub type *

- Standard
 - Once a day backup
 - 1-5 days operational tier
 - Vault tier
 - ZRS resilient snapshot tier
 - Support for Trusted Azure VM
- Enhanced
 - Multiple backups per day (Preview)
 - 1-30 days operational tier
 - Vault tier
 - ZRS resilient snapshot tier
 - Support for Trusted Azure VM

Backup policy *

EnhancedPolicy
[Create a new policy](#)

Protection operations are based on the OS disk type selected for Azure VM. Enhanced Policy takes the first snapshot as configuration. Pricing of Standard policy and enhanced policy varies. [Learn more](#).

Policy Details

Full Backup

Backup Frequency
Every 4 hour(s) starting 8:00 AM UTC for 12 Hour(s)

Instant Restore
Retain instant recovery snapshot(s) for 2 day(s)

Retention of daily backup point
Retain backup taken every day for 30 Day(s)

Virtual Machines

Name

No Virtual machines selected.

[Add](#)

[Enable backup](#)

[Download a template for automation](#)

Create policy

Azure Virtual Machine

Policy name

AhmedBKPPolicy

- The value has a length of at least 3.
- The value has a length of at most 150.
- Characters are valid.
- Policy name is available.

Backup schedule

Frequency * Start time * Schedule * Duration * Timezone *

Hourly 8:00 AM Every 4 Hours 12 Hours (UTC) Coordinated Universal Time

Instant Restore

Retain instant recovery snapshot(s) for 7 Day(s)

Retention range

Azure Backup transfers the data from instant restore point to vault once a day. [Learn more](#)

- Retention of daily backup point
For 30 Day(s)
- Retention of weekly backup point
Not Configured
- Retention of monthly backup point
Not Configured
- Retention of yearly backup point

[OK](#)

Home > Microsoft.RecoveryServicesV2-1664425538893 | Overview > AhmedRSV | Backup >

Configure Backup

AhmedRSV

- Vault tier
- ZRS resilient snapshot tier
- Support for Trusted Azure VM
- Vault tier
- ZRS resilient snapshot tier
- Support for Trusted Azure VM

Backup policy *

(new) AhmedBKPPolicy
[Edit this policy](#)

Protection operations are based on the OS disk type selected for Azure VM. Enhanced Policy takes the first snapshot as configuration. Pricing of Standard policy and enhanced policy varies. [Learn more](#).

Policy Details

Full Backup

Backup Frequency
Every 4 hour(s) starting 8:00 AM UTC for 12 Hour(s)

Instant Restore
Retain instant recovery snapshot(s) for 7 day(s)

Retention of daily backup point
Retain backup taken every day for 30 Day(s)

Virtual Machines

Name

No Virtual machines selected.

[Add](#)

OS Disk only backup option allows you to backup Azure Virtual Machine with only OS disk and exclude all the data disks. You can learn more about this feature, its limitation and pricing. [Learn more](#).

[Enable backup](#)

[Download a template for automation](#)

Select virtual machines

Discovering virtual machines that can be backed up, are in the same region as vault and not protected by another vault.

Filter items by name

Virtual machine name	Resource Group
<input checked="" type="checkbox"/> web-1	LBLabs
<input type="checkbox"/> web-2	LBLabs
<input type="checkbox"/> web-3	LBLabs

< Previous Page 1 of 1 Next >

[OK](#)

[Cancel](#)

Azure Administrator (AZ-104) | Lab Guide

Home > ConfigureProtection-1664426939480 | Overview > AhmedRSV

AhmedRSV | Backup items

Recovery Services vault

Search

Refresh

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Settings
 - Identity
 - Private endpoint connections
 - Properties
 - Locks
- Getting started
 - Backup
 - Site Recovery
- Protected items
 - Backup items**
 - Replicated items

Primary Region Secondary Region

BACKUP MANAGEMENT TYPE BACKUP ITEM COUNT

BACKUP MANAGEMENT TYPE	BACKUP ITEM COUNT
Azure Virtual Machine	1
Azure Backup Agent	0
Azure Backup Server	0
DPM	0
Azure Storage (Azure Files)	0
SQL in Azure VM	0
SAP HANA in Azure VM	0

Home > ConfigureProtection-1664426939480 | Overview > AhmedRSV | Backup items >

Backup Items (Azure Virtual Machine)

AhmedRSV

Refresh + Add Filter

With Backup center, you can view all your IaaS VM items across vaults, subscriptions and regions in a single pane of glass. Click here to use the new experience. →

All data fetched from the service.

Filter items ...

Name ↑↓	Resource Group ↑↓	Backup Pre-Check	Last Backup Status	Latest restore point ↑↓
web-1	LB Labs	Passed	Warning (Initial backup pending)	

< Previous Page 1 of 1 Next >

Azure Administrator (AZ-104) | Lab Guide

Now you can restore and stop the backup

Home > AhmedRSV | Backup items > Backup Items (Azure Virtual Machine) >

web-1 ...
Backup Item

Backup now **Restore VM** File Recovery **Stop backup** Resume backup Delete backup data Restore to Secondary Region Undelete

Backup pre-checks for this item point to issues that may lead to backup failures. Click here to resolve them →

Essentials

Recovery services vault : [AhmedRSV](#)
Subscription (move) : [MSDN_SC](#)
Subscription ID : a7632f95-7f0d-4342-adda-dbc286dbe45c
Alerts (in last 24 hours) : [View alerts](#)
Jobs (in last 24 hours) : [View jobs](#)

Backup Pre-Check : **Warning**
Last backup status : **Success** 9/29/2022, 10:52:30 AM
Backup policy : [AhmedBKPolicy](#)
Oldest restore point : 9/29/2022, 10:31:57 AM (37 minute(s) ago)

Recovery points

This list is filtered for last 30 days of recovery points. To recover from recovery point older than 30 days, as well as vault-archive, [click here](#).
Long term recovery points can be moved to vault-archive. To move all 'recommended recovery points' to vault-archive tier, [click here](#).

CRASH CONSISTENT 0 APPLICATION CONSISTENT 2 FILE-SYSTEM CONSISTENT 0

Time ↑↓	Consistency	Recovery type
9/29/2022, 10:52:33 AM	Application Consistent	Snapshot
9/29/2022, 10:31:57 AM	Application Consistent	Snapshot

Home > AhmedRSV | Backup items > Backup Items (Azure Virtual Machine) > web-1 >

Restore Virtual Machine

web-1

Restore allows you to restore VM/disks from a selected Restore Point.

Restore point *
[Select](#)

Data Store Snapshot

Restore Configuration

Create new
 Replace existing

i To create an alternate configuration when restoring your VM (from the following menus), use PowerShell cmdlets.

Restore Type *

Virtual machine name *

Resource group *
LBLABS

Virtual network *

Subnet *

Staging Location *
[Can't find your storage account?](#)

Restore

Backup files and folders

Home > Recovery Services vaults > AhmedRSV

The screenshot shows the Azure Backup configuration interface for a Recovery Services vault named 'AhmedRSV'. The left-hand navigation pane includes sections for 'Overview', 'Activity log', 'Access control (IAM)', 'Tags', 'Diagnose and solve problems', 'Settings', and 'Getting started'. The 'Getting started' section is expanded, and the 'Backup' option is highlighted with a red box. The main content area contains two dropdown menus: 'Where is your workload running?' with 'On-Premises' selected (highlighted with a red box), and 'What do you want to backup?' with 'Files and folders' selected (highlighted with a red box). Below these dropdowns, a list of backup targets is shown with checkboxes: 'Files and folders' (checked), 'Hyper-V Virtual Machine', 'VMWare Virtual Machine', 'Microsoft SQL Server', 'Microsoft SharePoint', 'Microsoft Exchange', 'System State', and 'Bare Metal Recovery'.

This screenshot shows the 'Prepare Infrastructure' step of the Azure Backup configuration. The left-hand navigation pane is the same as in the previous screenshot. The main content area shows the 'Where is your workload running?' dropdown set to 'On-Premises' and the 'What do you want to backup?' dropdown set to 'Files and folders'. Below these, the text 'Step: Prepare Infrastructure' is displayed, followed by a blue button labeled 'Prepare Infrastructure' which is highlighted with a red box.

Download both of backup agent and vault credentials to the server you want to backup (I'll use web-2 VM)

Home > Recovery Services vaults > AhmedRSV | Backup >

Prepare infrastructure ...

Recovery Services Agent

Please follow the steps mentioned below.

1. Install Recovery Services agent
[Download Agent for Windows Server or Windows Client](#)
2. Download vault credentials to register the server to the vault. Vault credentials will expire after 10 days.
 Already downloaded or using the [latest Recovery Services Agent](#)

[Download](#)

3. Schedule backup using Recovery Services Agent UI. [Learn More](#)
4. Once the backups are scheduled, you can use backup jobs page to monitor the backups. [Browse jobs page](#)
5. You can also Configure Notifications from alerts page to receive email alerts for backup failures. [Browse alerts page](#)

Microsoft Azure Recovery Services Agent Setup Wizard X

Installation Settings

Installation Stages

- Installation Settings
- Proxy Configuration
- Microsoft Update Opt-In
- Installation

Installation Folder

Microsoft Azure Recovery Services Agent will be installed in the following folder. To choose a different installation folder, click Browse. The location specified must have at least 1 GB of free space.

[Browse](#)

Cache Location

Microsoft Azure Recovery Services Agent can use this to keep track of files being backed up from your computer. The location specified must have free space which is atleast 5% of the backup data.

[Browse](#)

[< Back](#) [Next >](#) [Cancel](#)

Microsoft Azure Recovery Services Agent Setup Wizard ×



Installation

Installation Stages

- Installation Settings
- Proxy Configuration
- Microsoft Update Opt-In
- Installation

Microsoft Azure Recovery Services Agent uses some optional Windows features that might not be installed on this server. The setup wizard is checking that the prerequisite software is installed.

Any missing software will be installed along with Microsoft Azure Recovery Services Agent.

Required software	Status
✓ Microsoft .NET Framework 4.5	Available
✓ Windows Powershell	Available

Microsoft Azure Recovery Services Agent Setup Wizard ×



Installation

Installation Stages

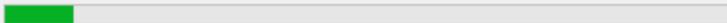
- Installation Settings
- Proxy Configuration
- Microsoft Update Opt-In
- Installation

Microsoft Azure Recovery Services Agent uses some optional Windows features that might not be installed on this server. The setup wizard is checking that the prerequisite software is installed.

Any missing software will be installed along with Microsoft Azure Recovery Services Agent.

Required software	Status
✓ Microsoft .NET Framework 4.5	Available
✓ Windows Powershell	Available

Validating install...



Microsoft Azure Recovery Services Agent Setup Wizard



Installation

Installation Stages

- Installation Settings
- Proxy Configuration
- Microsoft Update Opt-In
- Installation

Microsoft Azure Recovery Services Agent uses some optional Windows features that might not be installed on this server. The setup wizard is checking that the prerequisite software is installed.

Any missing software will be installed along with Microsoft Azure Recovery Services Agent.

Required software	Status
✓ Microsoft .NET Framework 4.5	Available
✓ Windows Powershell	Available

✓ Microsoft Azure Recovery Services Agent installation has completed successfully.

Click proceed to registration to register the server to a backup vault.

Proceed to Registration

Close

Register Server Wizard



Vault Identification

Vault Identification

Encryption Setting

Server Registration

Select the vault credentials downloaded from the quick start page in the Microsoft Azure Backup Vault.

Vault Credentials:

C:\Users\ahmed\Desktop\AhmedRSV_Thu Sep 29 2022.VaultCre

Browse

Backup Vault:

AhmedRSV

Region:

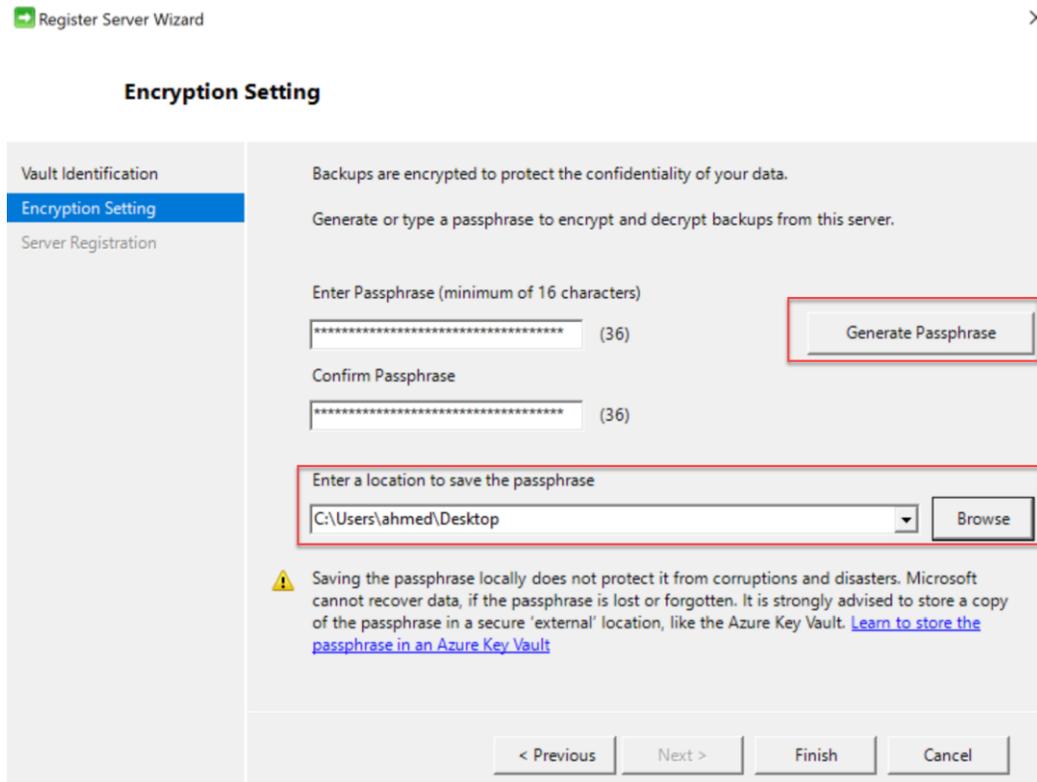
centralus

Subscription Identifier:

a7632f95-7f0d-4342-adda-dbc286dbe45c

Vault Credential expiry:

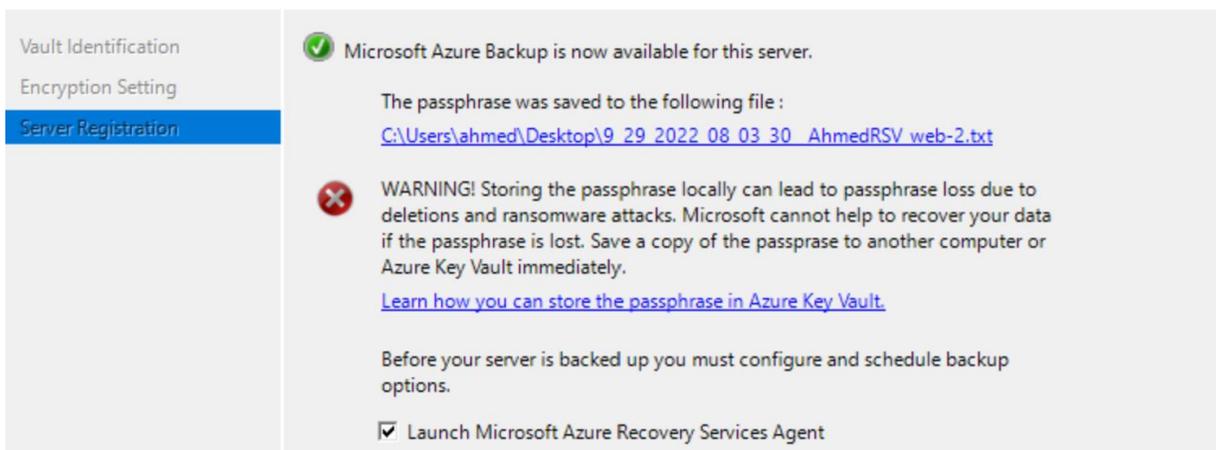
10/09/2022 07:58:54



Now server registered and we can back up our files

Register Server Wizard

Server Registration



Azure Administrator (AZ-104) | Lab Guide

Now going to back up user documents

The screenshot shows the Microsoft Azure Backup management interface. At the top, it states: "Microsoft Azure Backup supports scheduled backups of files and folders, and Windows System State (New) to an online location". Below this, there are sections for "Jobs (Activity in the past 7 days, double click on the message to see details)", "Status", and "Last Backup", "Next Backup", "Available Recovery Points", and "Last Recovery". On the right-hand side, an "Actions" menu is open, with the "Schedule Backup" option highlighted by a red box.

Schedule Backup Wizard

Select Items to Backup

The screenshot shows the "Select Items to Backup" wizard. On the left, a sidebar lists steps: "Getting started", "Select Items to Backup" (highlighted), "Specify Backup Schedule...", "Select Retention Policy (F...", "Choose Initial Backup Ty...", "Confirmation", and "Modify Backup Progress". The main area contains the instruction: "Click Add Items to select the files and folders you want to backup." Below this, a text box contains the path "C:\Users\ahmed\Documents\". At the bottom, a file explorer window is open to "This PC > Documents", showing two files: "9_29_2022_08_03_30_AhmedRSV_web-2" and "AhmedRSV_Thu Sep 29 2022.VaultCredentials". The "Add Items" button is highlighted with a red box.

Schedule Backup Wizard

Specify Backup Schedule (Files and Folders)

Getting started
Select Items to Backup
Specify Backup Schedule ...
Select Retention Policy (F...
Choose Initial Backup Ty...
Confirmation
Modify Backup Progress

Define a schedule when you want to create a backup copy for selected files and folders

Schedule a backup every

Day Week

At following times (Maximum allowed is three times a day)

11:30 PM 4:00 PM 8:30 PM

Schedule Backup Wizard

Select Retention Policy (Files and Folders)

Getting started
Select Items to Backup
Specify Backup Schedule ...
Select Retention Policy (F...
Choose Initial Backup Ty...
Confirmation
Modify Backup Progress

Specify the retention policy for the backup copy of files and folders

Daily Retention Policy

Retain backup copies taken At 11:30 PM 4:00 PM 8:30 PM for 180 Days

Weekly Retention Policy

Retain backup copies taken on Saturday At 11:30 PM 4:00 PM for 104 Weeks

Monthly Retention Policy

Retain backup copies taken on Saturday of Last Week On day(s) 1 At 11:30 PM 4:00 PM for 60 Months

Yearly Retention Policy

Retain backup copies taken on Saturday of Last Week of March March 1 At 11:30 PM 4:00 PM for 10 Years

Schedule Backup Wizard

Choose Initial Backup Type (Files and Folders)

Getting started
Select Items to Backup
Specify Backup Schedule ...
Select Retention Policy (F...
Choose Initial Backup Ty...
Confirmation
Modify Backup Progress

Initial Backup transfers a full backup of your data to Azure. Subsequent backups transfer only changes in your data. Specify the option for transferring the Initial Backup. [Help me choose.](#)

Online

Transfer over the network
Uses your network to move the initial backup data to Azure

Offline

Seed initial backup using storage devices without using network. Recommended for limited network bandwidth environments. Subsequent backups are done over the network.

Transfer using Microsoft Azure Data Box disks
Order an Azure Data Box (up to 100TB) or a single Data Box disk (up to 8TB) to transfer data from this server to Azure. Saves effort to procure and ship disks. Ensure you have already ordered your Data Box device. To order go to Azure > [Data Box](#). [Learn more.](#)

Transfer using my own disks
To transfer initial backup using this option, you must use Azure-compatible disks, connectors and shipping partners. Refer to our Offline Backup documentation for more details. [Learn more.](#)

Schedule Backup Wizard



Confirmation

Getting started

- Select Items to Backup
- Specify Backup Schedule ...
- Select Retention Policy (F...
- Choose Initial Backup Ty...
- Confirmation**
- Modify Backup Progress

You are about to save the following backup schedule and initiate initial backup.

Policy Type	Files and Folders
Files and Folders	

Backup Items	Selected items (C:\)
File (s) Excluded:	None
Backup Time:	11:30 PM, 4:00 PM, 8:30 PM
Backup Days:	Everyday
Weekly frequency:	Every 1 week(s)
Retention Days:	180
Initial Backup Creation	Network

Schedule Backup Wizard



Modify Backup Progress

Getting started

- Select Items to Backup
- Specify Backup Schedule ...
- Select Retention Policy (F...
- Choose Initial Backup Ty...
- Confirmation
- Modify Backup Progress**

Status:

✔ You have successfully created a backup schedule.

Action	Status
✔ Create backup schedule for Files and Folders	Success

You can also backup now

Back Up Now Wizard

Confirmation

Select Backup Item

Retain Backup Till

Confirmation

Backup progress

Back Up Now will backup this server using the following settings.

Backup Items: C:\Users\ahmed\Documents\

Files excluded: None

Retain Backup Till: 10/29/2022

Server Settings

Network throttling settings: Not Configured

Proxy server settings: Not Configured

[Change Properties](#)

< Previous Next > **Back Up** Cancel

Backup

- Register Server
- Schedule Backup
- Back Up Now**
- Recover Data
- Change Properties
- Open Portal
- About Microsoft Azure
- Privacy & Cookies
- View
- Help

Azure Administrator (AZ-104) | Lab Guide

Home > Recovery Services vaults > AhmedRSV

AhmedRSV | Backup items
Recovery Services vault

Search [] Refresh

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems

Settings

- Identity

For backups, try our new Backup Center. It offers Azure Backup customers a unified view of Recovery Services V along with new governance capabilities. Click here to get the new experience.

Primary Region Secondary Region

BACKUP MANAGEMENT TYPE	BACKUP ITEM COUNT
Azure Virtual Machine	1
Azure Backup Agent	1

Home > Recovery Services vaults > AhmedRSV | Backup items > Backup Items (Azure Backup Agent) >

C:\ on web-2.
Backup Item

Essentials

Recovery services vault : [AhmedRSV](#)

Computer name : [web-2](#)

Item Type : File-Folders

Last backup status : ✔ Success

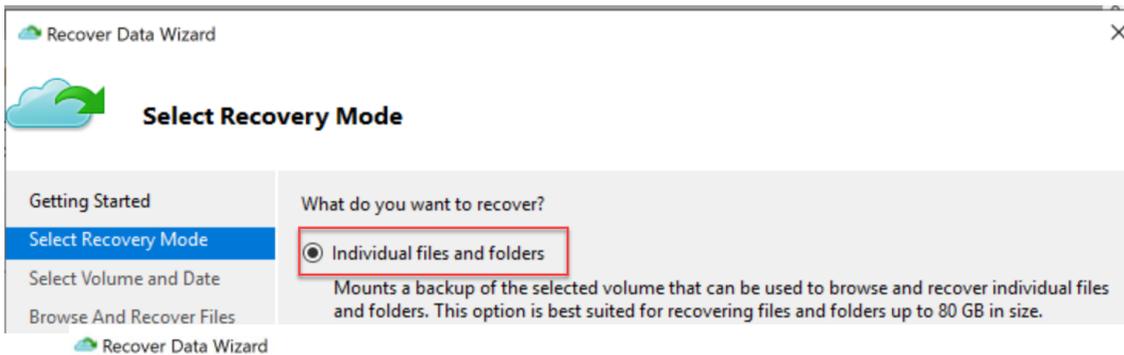
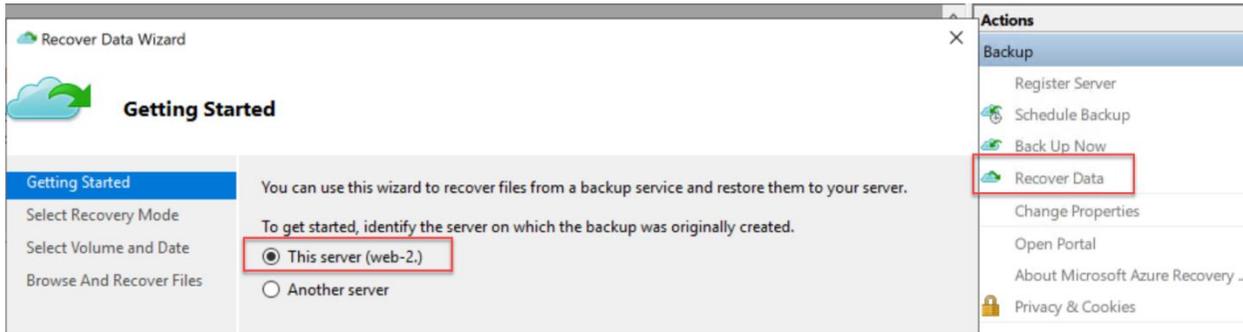
Last refreshed at : 9/29/2022, 1:24:05 PM

Monitoring

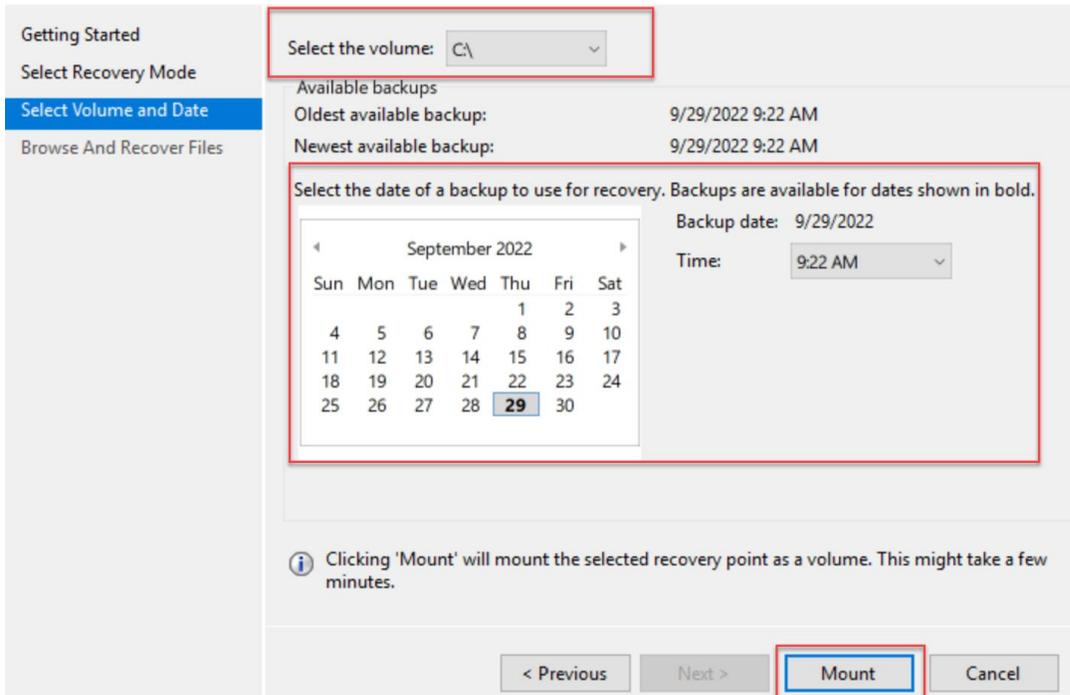
Recovery points	
Latest	9/29/2022, 1:22:12 PM
Oldest	9/29/2022, 1:22:12 PM
Total	1

Azure Administrator (AZ-104) | Lab Guide

To recover these data, you have to recover from azure backup agent



Select Volume and Date



Recover Data Wizard

Browse And Recover Files

Getting Started
Select Recovery Mode
Select Volume and Date
Browse And Recover Files

Status: Recovery volume mounted as disk. Browse volume from file explorer to recover items.

Recovery Details
Recovery Volume : F:\

ahmed > Documents

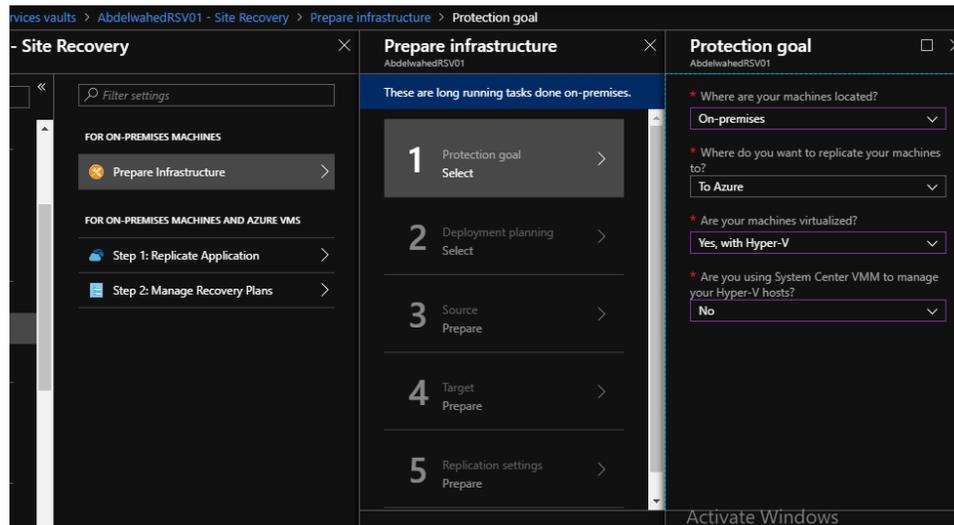
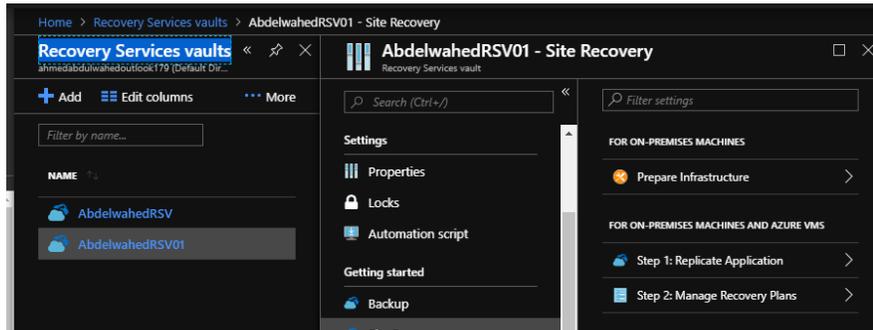
Name	Date modified	Type
9_29_2022_08_03_30_AhmedRSV_web-2	9/29/2022 8:03 AM	Text
AhmedRSV_Thu Sep 29 2022.VaultCredentials	9/29/2022 7:59 AM	VAU

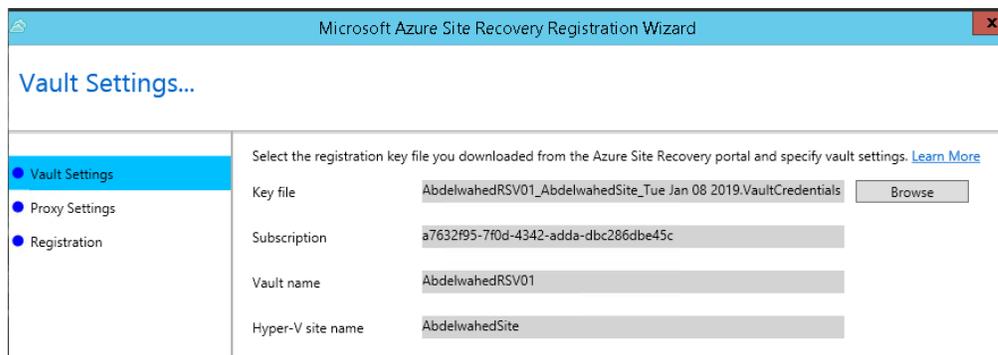
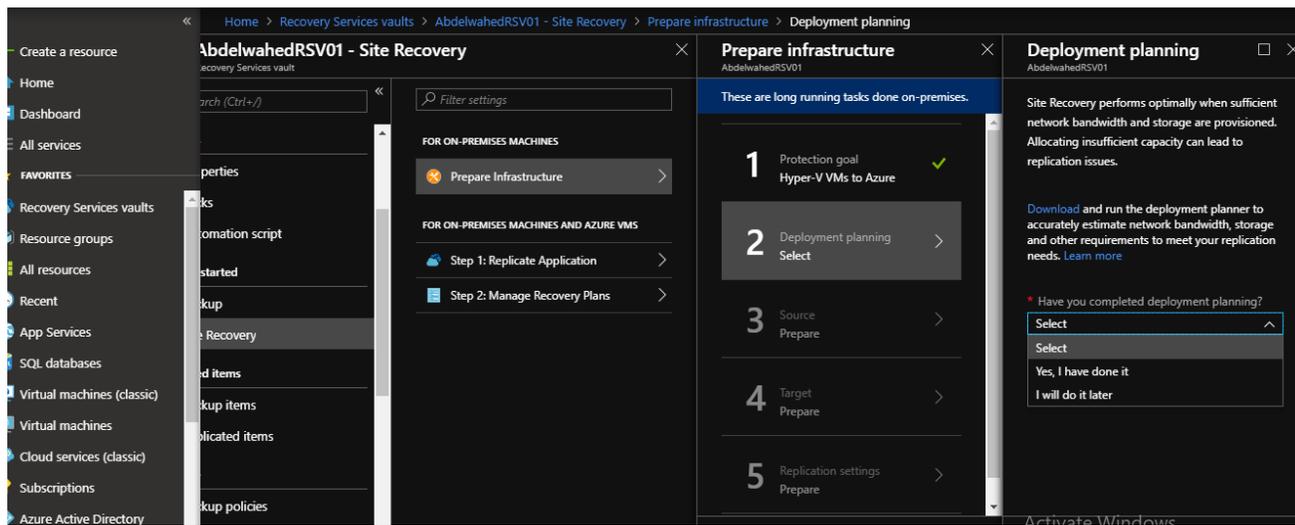
< Previous Next > **Browse** Unmount

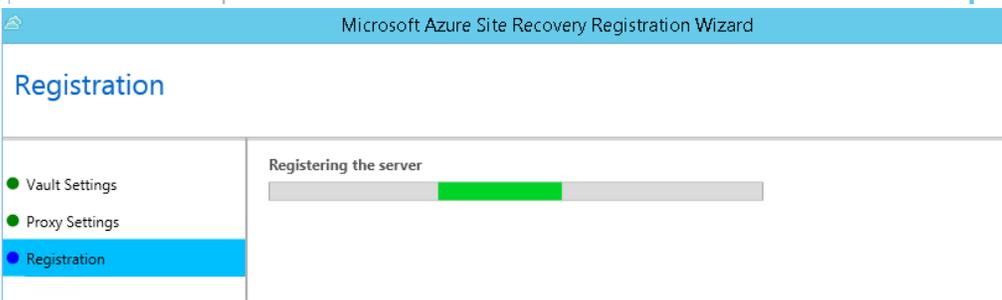
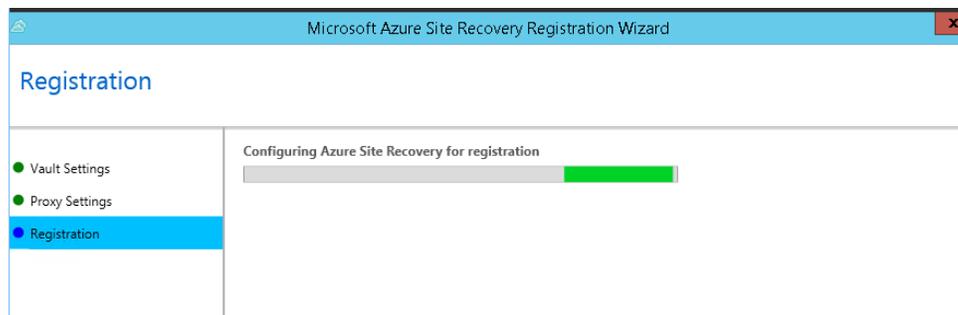
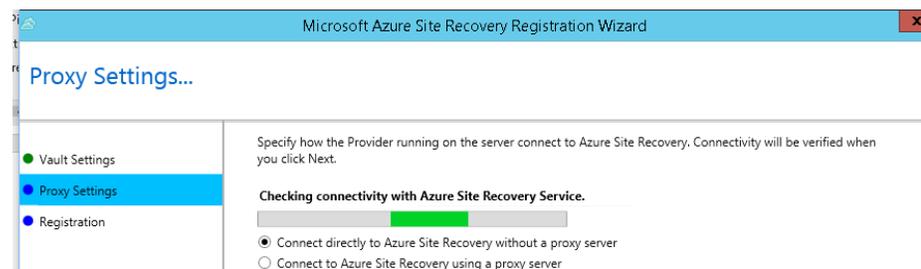
Azure Site Recovery

Configuring ASR for on-premises resources

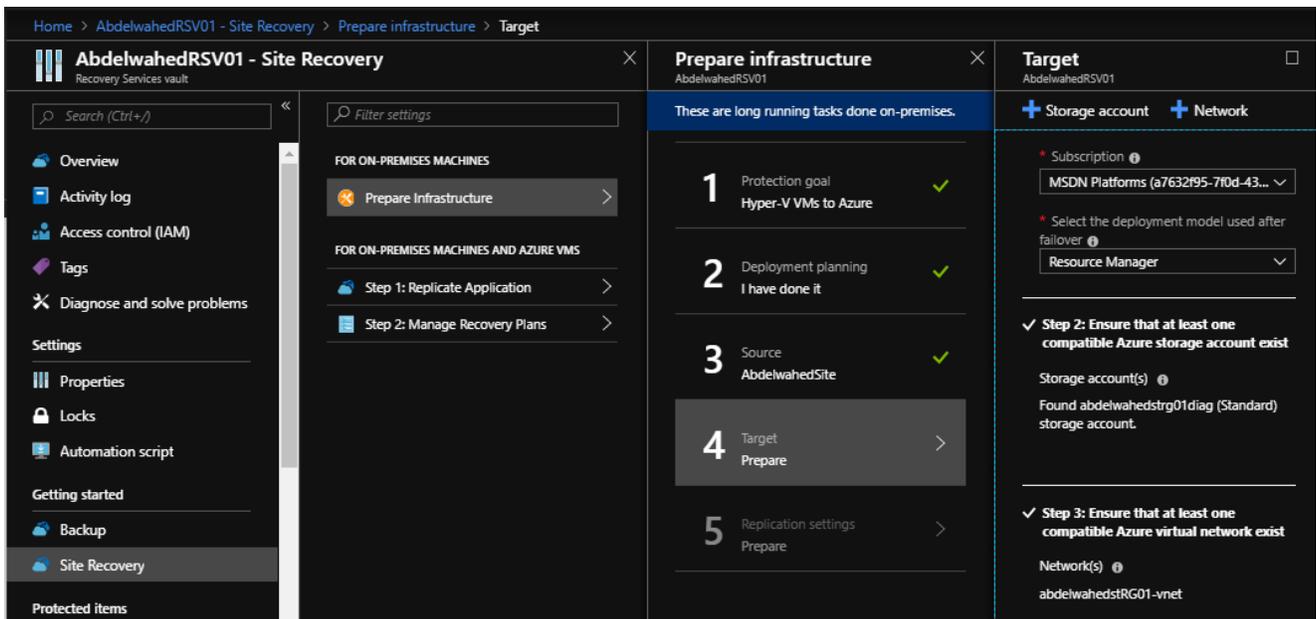
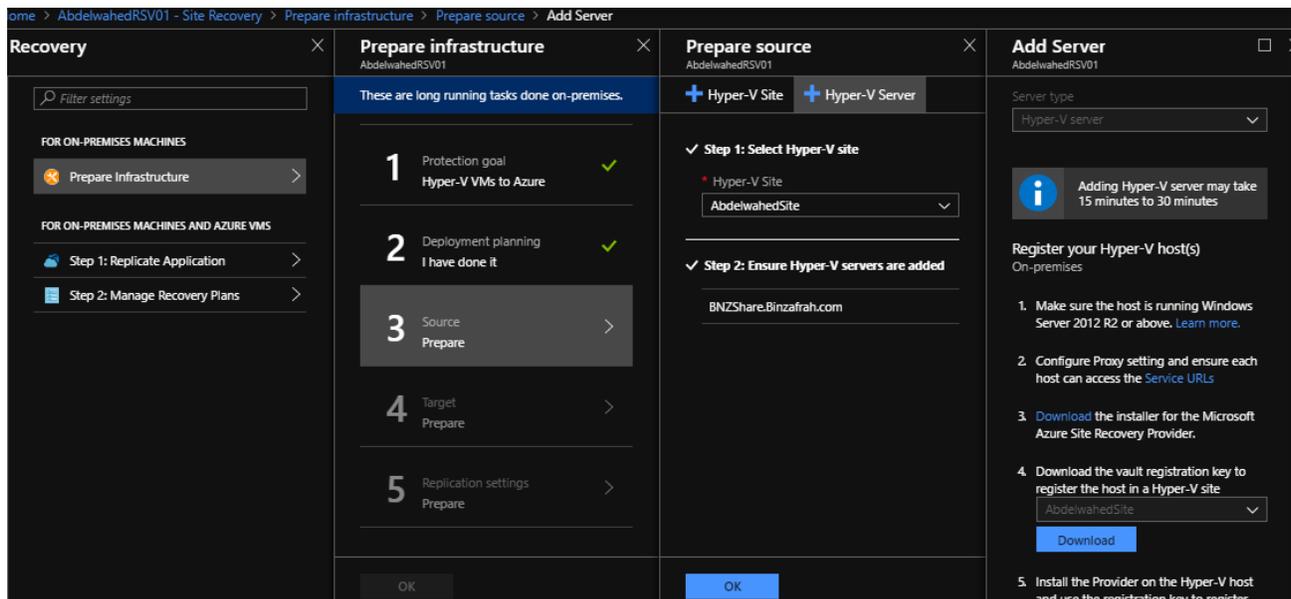
1. Prepare Infrastructure
2. Replicate Application
3. Manage Recovery Plans

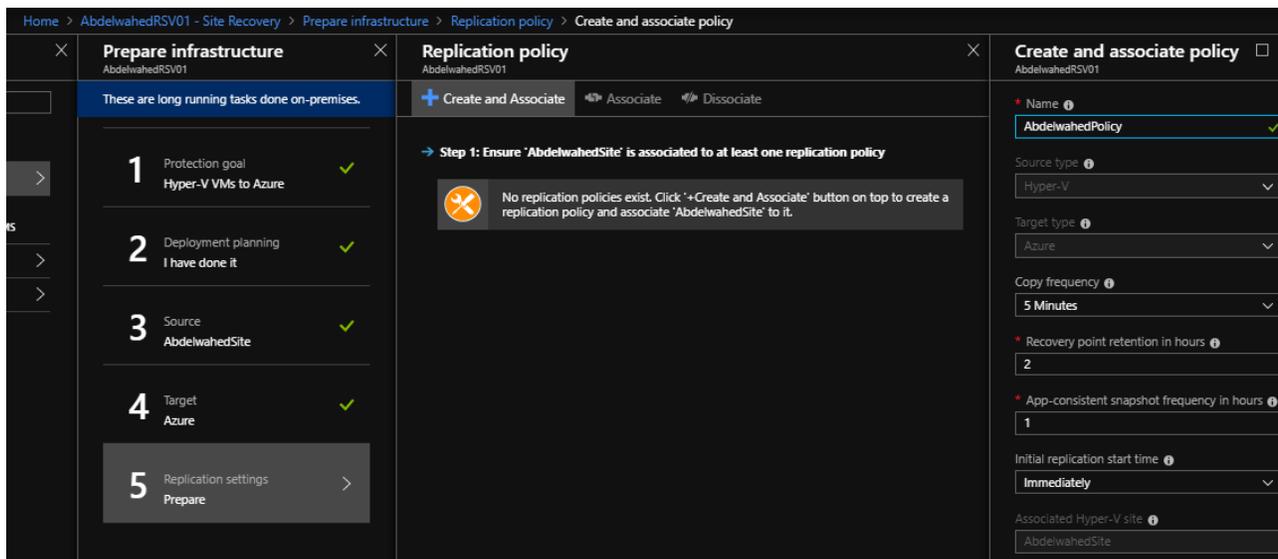






Azure Administrator (AZ-104) | Lab Guide





Home > AbdelwahedRSV01 - Site Recovery > Prepare infrastructure > Replication policy > Create and associate policy

Prepare infrastructure AbdelwahedRSV01

These are long running tasks done on-premises.

- 1 Protection goal: Hyper-V VMs to Azure ✓
- 2 Deployment planning: I have done it ✓
- 3 Source: AbdelwahedSite ✓
- 4 Target: Azure ✓
- 5 Replication settings: Prepare >

Replication policy AbdelwahedRSV01

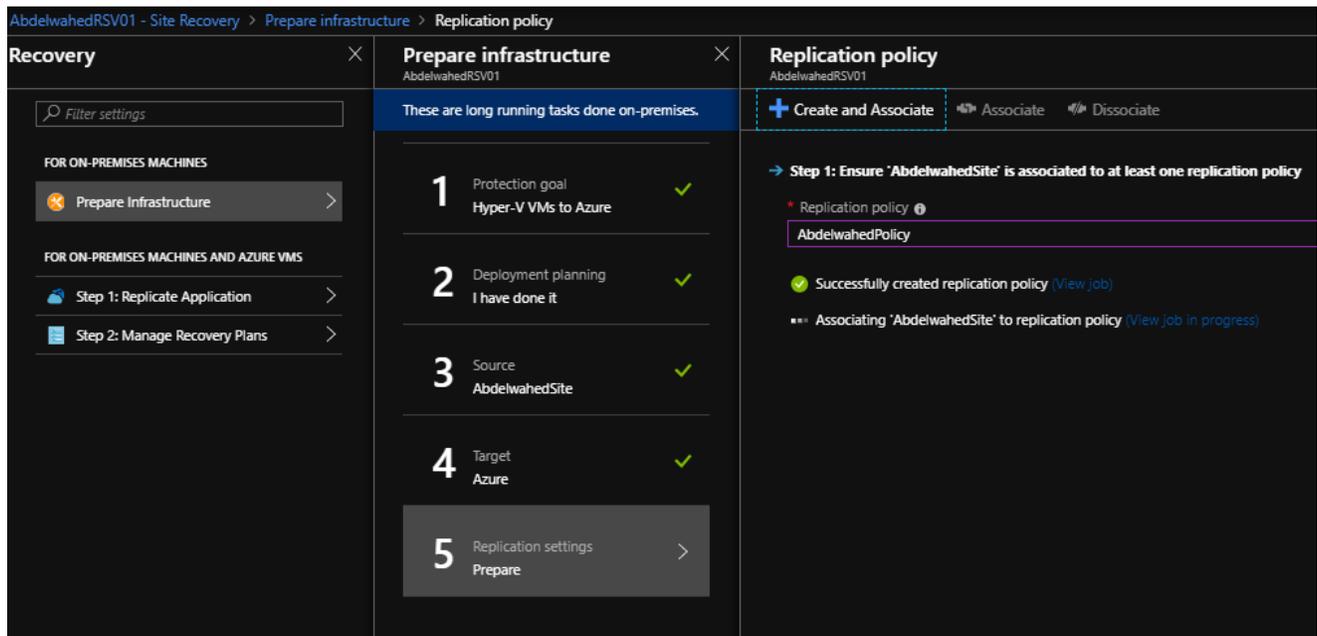
+ Create and Associate Associate Dissociate

→ Step 1: Ensure 'AbdelwahedSite' is associated to at least one replication policy

No replication policies exist. Click '+Create and Associate' button on top to create a replication policy and associate 'AbdelwahedSite' to it.

Create and associate policy AbdelwahedRSV01

- Name: AbdelwahedPolicy ✓
- Source type: Hyper-V
- Target type: Azure
- Copy frequency: 5 Minutes
- Recovery point retention in hours: 2
- App-consistent snapshot frequency in hours: 1
- Initial replication start time: Immediately
- Associated Hyper-V site: AbdelwahedSite



AbdelwahedRSV01 - Site Recovery > Prepare infrastructure > Replication policy

Recovery

Filter settings

FOR ON-PREMISES MACHINES

- Prepare Infrastructure >

FOR ON-PREMISES MACHINES AND AZURE VMs

- Step 1: Replicate Application >
- Step 2: Manage Recovery Plans >

Prepare infrastructure AbdelwahedRSV01

These are long running tasks done on-premises.

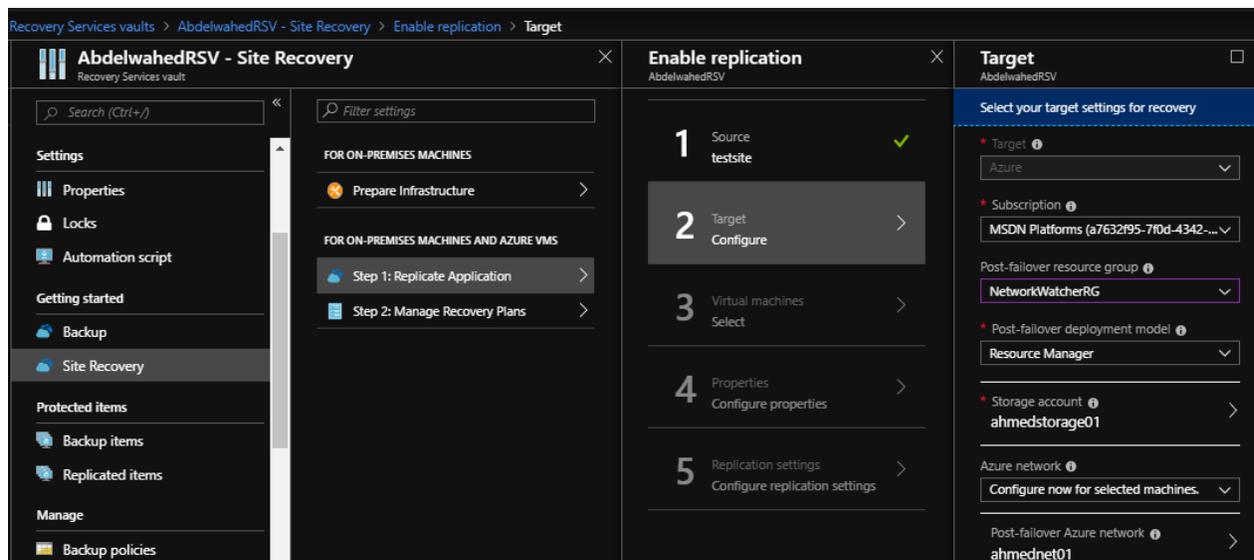
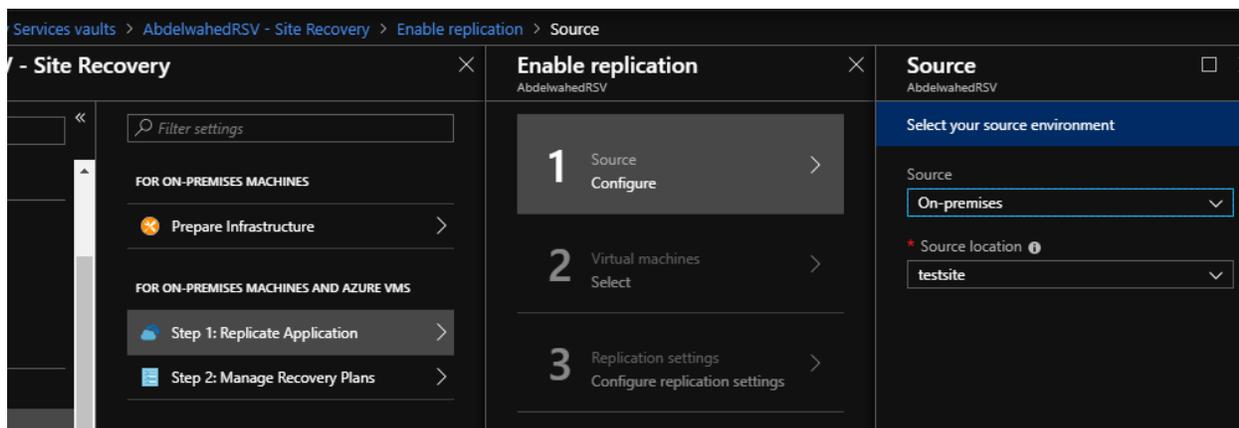
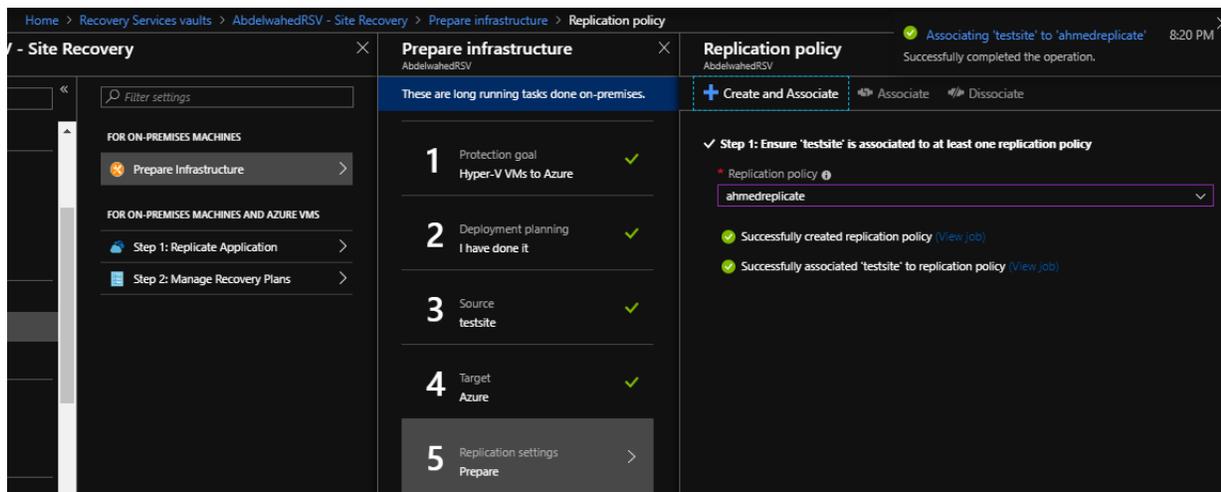
- 1 Protection goal: Hyper-V VMs to Azure ✓
- 2 Deployment planning: I have done it ✓
- 3 Source: AbdelwahedSite ✓
- 4 Target: Azure ✓
- 5 Replication settings: Prepare >

Replication policy AbdelwahedRSV01

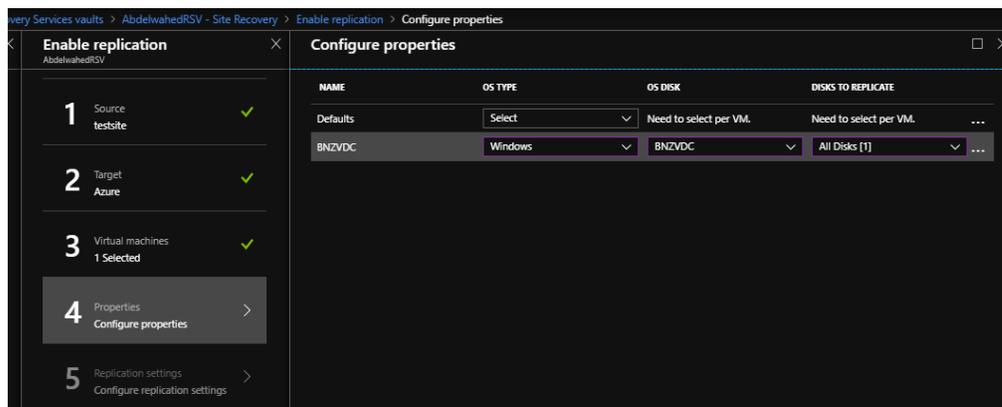
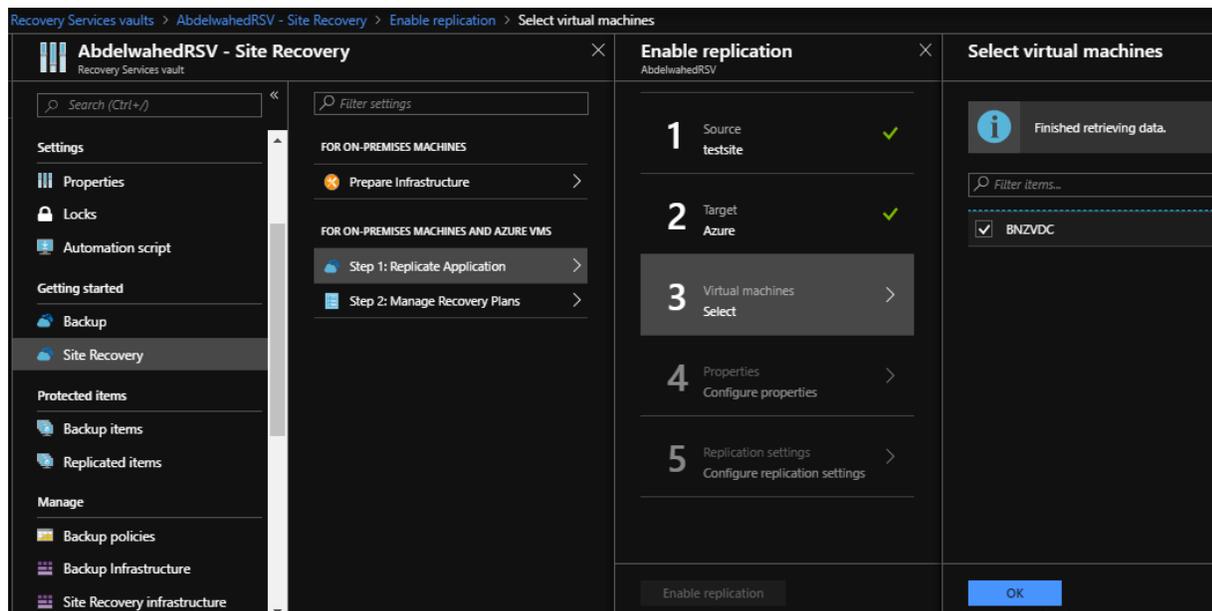
+ Create and Associate Associate Dissociate

→ Step 1: Ensure 'AbdelwahedSite' is associated to at least one replication policy

- Replication policy: AbdelwahedPolicy
- Successfully created replication policy (View job)
- Associating 'AbdelwahedSite' to replication policy (View job in progress)

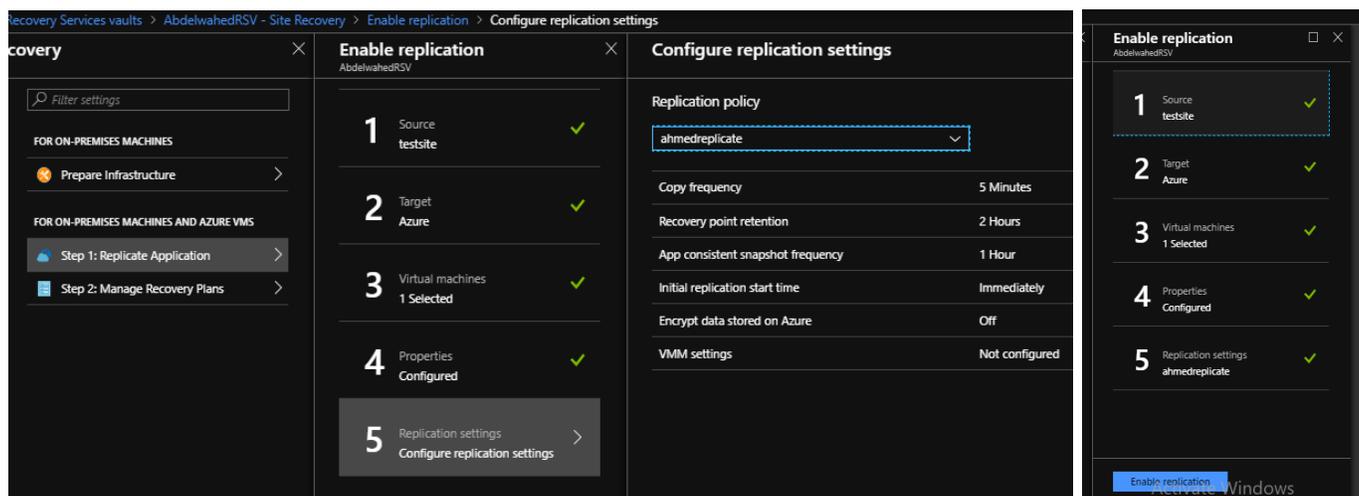


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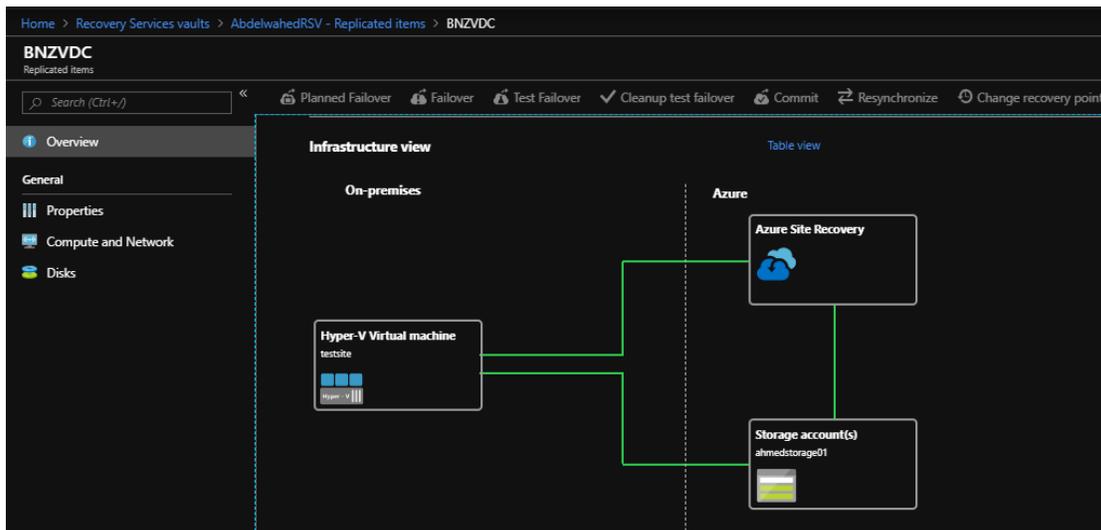
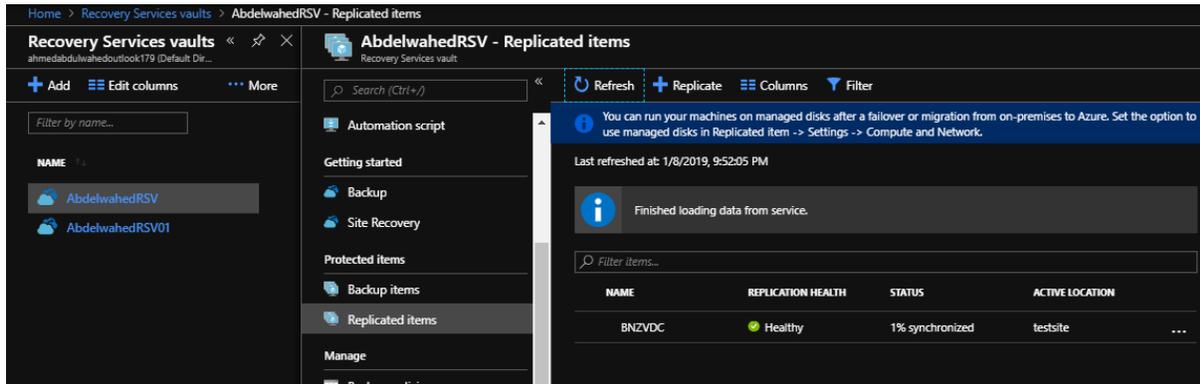
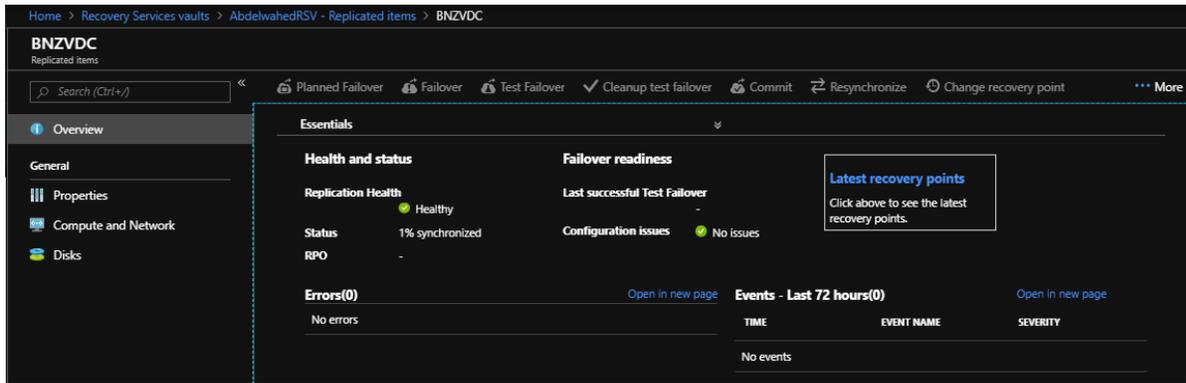


set
policy

replication



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Failover and migrating the VM

