

Course-End Project 1

Connecting Internet Workloads Using Vnet Peering and Assigning a Custom Role for Operating These Workloads

Steps to be followed:

1. Creating Test Virtual Machines and Virtual Networks
2. Establishing Vnet Peering
3. Testing connectivity
4. Creating a custom RBAC Role
5. Adding a user to the Directory and Assign the custom RBAC Role

Step 1: Creating Test Virtual Machines and Virtual Networks

- 1.1 Sign in to the Azure portal

1.2 Create a virtual network **vnet1** with an IP address space of 10.0.0.0/16. Then, add a subnet (**subnet1**) with a subnet address range of 10.0.0.0/24

Create virtual network ...

✓ Validation passed

Basics IP Addresses Security Tags Review + create

Basics

Subscription	Simplilearn HOL 100209
Resource group	RG01
Name	vnet1
Region	East US

IP addresses

Address space	10.0.0.0/16
Subnet	subnet1 (10.0.0.0/24)

Tags

None

Security

BastionHost	Disabled
DDoS protection plan	Basic
Firewall	Disabled

Create

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1.3 Create a virtual network **vnet2** with an IP address space of 10.1.0.0/16. Next, add a subnet (**subnet2**) with a subnet address range of 10.1.0.0/24

Create virtual network ...

✓ Validation passed

Basics IP Addresses Security Tags Review + create

Basics

Subscription	Simplilearn HOL 100209
Resource group	RG01
Name	vnet2
Region	East US

IP addresses

Address space	10.1.0.0/16
Subnet	subnet2 (10.1.0.0/24)

Tags

None

Security

BastionHost	Disabled
DDoS protection plan	Basic
Firewall	Disabled

Create

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1.4 Create a virtual machine (**vm1**) in **vnet1** virtual network

Properties	Value
Image	Windows Server 2019 Datacenter - Gen2
Vm Name	vm1
Region	East US
Username	Testuser
Password	Pa\$\$word@12345
Size	Ds1V2

Create a virtual machine ...

✓ Validation passed

Basics

Subscription	Simplilearn HOL 100209
Resource group	RG01
Virtual machine name	vm1
Region	East US
Availability options	No infrastructure redundancy required
Security type	Standard
Image	Windows Server 2019 Datacenter - Gen2
Size	Standard DS1 v2 (1 vcpu, 3.5 GiB memory)
Username	testuser
Public inbound ports	RDP
Already have a Windows license?	No
Azure Spot	No

Disks

OS disk type	Premium SSD LRS
Use managed disks	Yes
Delete OS disk with VM	Enabled
Ephemeral OS disk	No

Networking

Virtual network	vnet1
Subnet	subnet1 (10.0.0.0/24)
Public IP	(new) vm1-ip
Accelerated networking	On
Place this virtual machine behind an existing load balancing solution?	No
Delete public IP and NIC when VM is deleted	Disabled

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1.5 Create another virtual machine (**vm2**) in **vnet2** virtual network

Properties	Value
Image	Windows Server 2019 Datacenter - Gen2
Vm Name	vm2
Region	East US
Username	Testuser
Password	Pa\$\$word@12345
Size	Ds1V2

Create a virtual machine ...

✓ Validation passed

Basics

Subscription	Simplilearn HOL 100209
Resource group	RG01
Virtual machine name	vm2
Region	East US
Availability options	No infrastructure redundancy required
Security type	Standard
Image	Windows Server 2019 Datacenter - Gen2
Size	Standard DS1 v2 (1 vcpu, 3.5 GiB memory)
Username	testuser
Public inbound ports	RDP
Already have a Windows license?	No
Azure Spot	No

Disks

OS disk type	Premium SSD LRS
Use managed disks	Yes
Delete OS disk with VM	Enabled
Ephemeral OS disk	No

Networking

Virtual network	vnet2
Subnet	subnet2 (10.1.0.0/24)
Public IP	(new) vm2-ip
Accelerated networking	On
Place this virtual machine behind an existing load balancing solution?	No
Delete public IP and NIC when VM is	Disabled

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Step 2: Establishing Vnet peering

2.1 Locate the **vnet1** virtual network

2.2 Select **Peering**. Then, add a **peering connection**

Properties	Value
Peering link name	vnet1tovnet2
Traffic to remote virtual network	Allow
Traffic forwarded from remote virtual network	Allow
Virtual network gateway or Route Server	None
Remote virtual network peering link name	vnet2tovnet1
Virtual network deployment model	Resource manager
Subscription	Simplilearn HOL 100209
Virtual network	Vnet2

Add peering ...

vnet1

Peering link name *

vnet1tovnet2



Traffic to remote virtual network ⓘ

- ☒ Allow (default)
- ☐ Block all traffic to the remote virtual network

Traffic forwarded from remote virtual network ⓘ

- ☒ Allow (default)
- ☐ Block traffic that originates from outside this virtual network

Virtual network gateway or Route Server ⓘ

- ☐ Use this virtual network's gateway or Route Server
- ☐ Use the remote virtual network's gateway or Route Server
- ☒ None (default)

Remote virtual network

Peering link name *

vnet2tovnet1



Virtual network deployment model ⓘ

- ☒ Resource manager
- ☐ Classic

☐ I know my resource ID ⓘ

Subscription * ⓘ

Simplilearn HOL 100209



Virtual network *

vnet2



Traffic to remote virtual network ⓘ

- ☒ Allow (default)

Add

2.3 Check whether Peering status is connected

vnet1 | Peerings

Virtual network

Search (Ctrl+/)

+ Add Refresh Sync

Filter by name...

Peering status == all

Name ↑↓	Peering status ↑↓	Peer ↑↓
vnet1tovnet2	Connected	vnet2

Step 3: Testing connectivity

3.1 Connect to vm1 with RDP

Home > RG01 > vm1

vm1 | Connect

Virtual machine

Search (Ctrl+/)

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

Settings

Networking Connect Windows Admin Center (preview) Disks Size Security Advisor recommendations Extensions + applications Continuous delivery

To improve security, enable just-in-time access on this VM. →

RDP SSH Bastion

Connect with RDP

To connect to your virtual machine via RDP, select an IP address, optionally change the port number, and download the RDP file.

IP address *

Public IP address (20.127.25.50)

Port number *

3389

Download RDP File

Can't connect?

Test your connection Troubleshoot RDP connectivity issues

Feedback on connections

Tell us about your RDP experience

Windows Security ×

Enter your credentials

These credentials will be used to connect to 20.127.25.50.

testuser

••••••••••••••••

☐ Remember me

OK Cancel

3.2 Enable ICMP through the Windows firewall so that you can ping **vm1** from **vm2** by
below command

New-NetFirewallRule -DisplayName "Allow ICMPv4-In" -Protocol ICMPv4

```
PS C:\Users\testuser> New-NetFirewallRule -DisplayName "Allow ICMPv4-In" -Protocol ICMPv4

Name                : {a5aef411-2209-4aa1-bc97-d8726615d2c2}
DisplayName          : Allow ICMPv4-In
Description          :
DisplayGroup         :
Group                :
Enabled              : True
Profile              : Any
Platform             : {}
Direction            : Inbound
Action               : Allow
EdgeTraversalPolicy  : Block
LooseSourceMapping   : False
LocalOnlyMapping     : False
Owner                :
PrimaryStatus        : OK
Status               : The rule was parsed successfully from the store. (65536)
EnforcementStatus    : NotApplicable
PolicyStoreSource    : PersistentStore
PolicyStoreSourceType : Local
```

3.3 Connect to **vm2** with RDP and ping **vm1**
ping 10.1.0.4

```
PS C:\Users\azureuser> ping 10.1.0.4

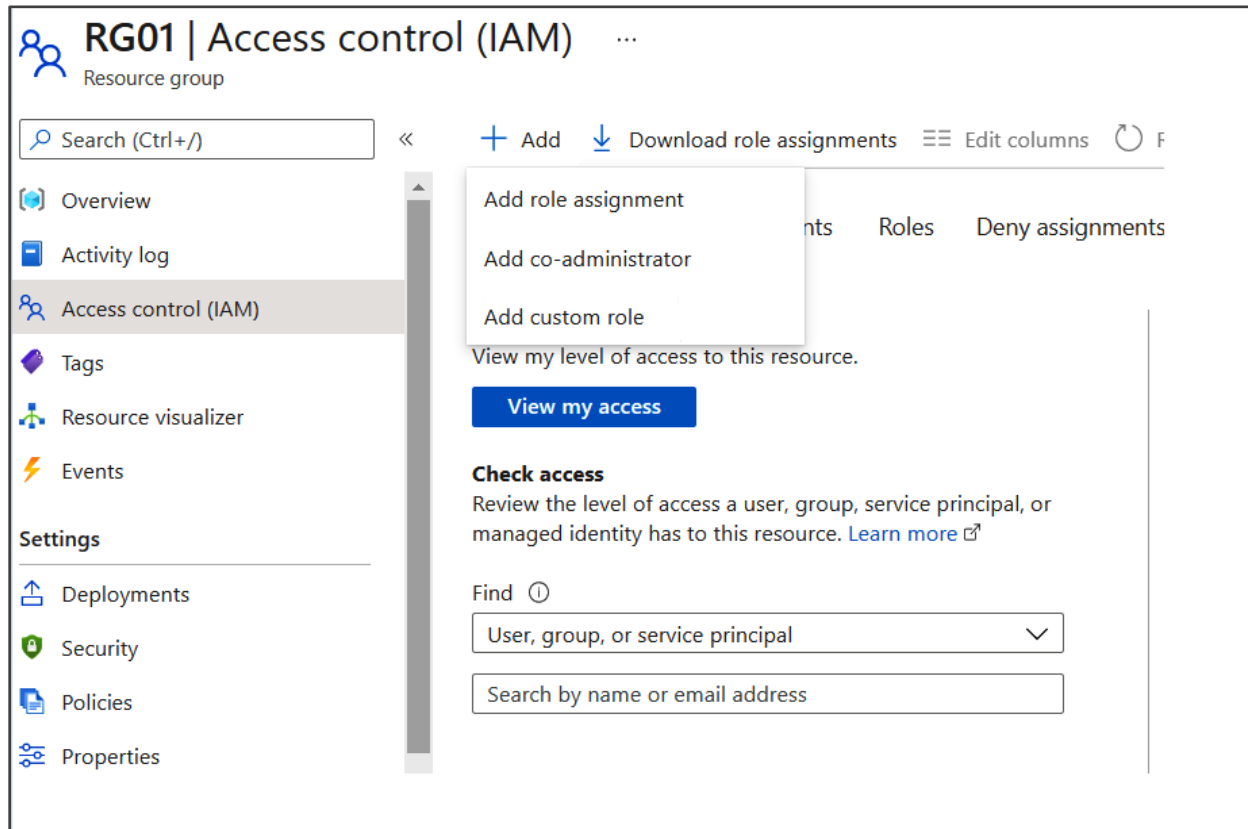
Pinging 10.1.0.4 with 32 bytes of data:
Reply from 10.1.0.4: bytes=32 time<1ms TTL=128
Reply from 10.1.0.4: bytes=32 time<1ms TTL=128
Reply from 10.1.0.4: bytes=32 time<1ms TTL=128
Reply from 10.1.0.4: bytes=32 time<1ms TTL=128

Ping statistics for 10.1.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Step 4: Creating a custom RBAC Role

4.1 Go to **Resource Group > Access Control (IAM)**


4.2 Select **Add custom role**




The screenshot shows the Azure portal interface for the 'Access control (IAM)' page of a resource group named 'RG01'. The left sidebar contains a navigation menu with options: Overview, Activity log, Access control (IAM) (selected), Tags, Resource visualizer, Events, Settings, Deployments, Security, Policies, and Properties. The main content area has a search bar and a toolbar with buttons for '+ Add', 'Download role assignments', 'Edit columns', and a refresh icon. A dropdown menu is open under the '+ Add' button, showing three options: 'Add role assignment', 'Add co-administrator', and 'Add custom role'. Below the dropdown, there is a link to 'View my level of access to this resource.' and a button labeled 'View my access'. Further down, there is a section titled 'Check access' with a description and a 'Learn more' link. At the bottom, there is a 'Find' section with a search box containing the text 'User, group, or service principal' and a secondary search box labeled 'Search by name or email address'.

4.3 Under the **Basics** tab, provide a custom role name. Next, select **Start from scratch**


Create a custom role ...

 Got feedback?

Basics Permissions Assignable scopes JSON Review + create

To create a custom role for Azure resources, fill out some basic information. [Learn more](#) 

* Custom role name ⓘ

computer operator 

Description

Baseline permissions ⓘ

☐

Clone a role

☒

Start from scratch

☐

Start from JSON

4.4 Under the **Permissions** tab, add all the permissions as shown in the image:

Microsoft.Compute/virtualMachines/read

Microsoft.Compute/virtualMachines/start/action

Microsoft.Compute/virtualMachines/restart/action

Microsoft.Network/virtualNetworks/read

Microsoft.Storage/storageAccounts/read/

Microsoft.Storage/storageAccounts/blobServices/containers/read

Microsoft.Resources/subscriptions/resourceGroups/read

Microsoft.Resources/subscriptions/read

Create a custom role ...

Got feedback?

[Basics](#)
[Permissions](#)
[Assignable scopes](#)
[JSON](#)
[Review + create](#)


[+ Add permissions](#)
[+ Exclude permissions](#)

Click Add permissions to select the permissions you want to add to this custom role.
 To add a wildcard (*) permission, you must manually add the permission on the JSON tab. [Learn more](#)
 To exclude specific permissions from a wildcard permission, click Exclude permissions. [Learn more](#)

Permission	↑↓	Description	↑↓	Permission type	↑↓
Microsoft.Compute/virtualMachines/read		Get the properties of a virtual machine		Action	
Microsoft.Compute/virtualMachines/start/action		Starts the virtual machine		Action	
Microsoft.Compute/virtualMachines/restart/action		Restarts the virtual machine		Action	
Microsoft.Network/virtualNetworks/read		Get the virtual network definition		Action	
Microsoft.Storage/storageAccounts/read		Returns the list of storage accounts or gets the prop...		Action	
Microsoft.Storage/storageAccounts/blobServices/co...		Returns a container		Action	
Microsoft.Resources/subscriptions/resourceGroups/r...		Gets or lists resource groups.		Action	
Microsoft.Resources/subscriptions/read		Gets the list of subscriptions.		Action	

4.5 Under the **Review + create** tab, select **Create**

Create a custom role ...

 Got feedback?

[Basics](#) [Permissions](#) [Assignable scopes](#) [JSON](#) [Review + create](#)

Basics

Role name computer operator

Role description *No role description provided*

Permissions

Action Microsoft.Compute/virtualMachines/read

Action Microsoft.Compute/virtualMachines/restart/action

Action Microsoft.Compute/virtualMachines/start/action

Action Microsoft.Network/virtualNetworks/read

Action Microsoft.Storage/storageAccounts/read

Action Microsoft.Storage/storageAccounts/blobServices/read

Assignable Scopes

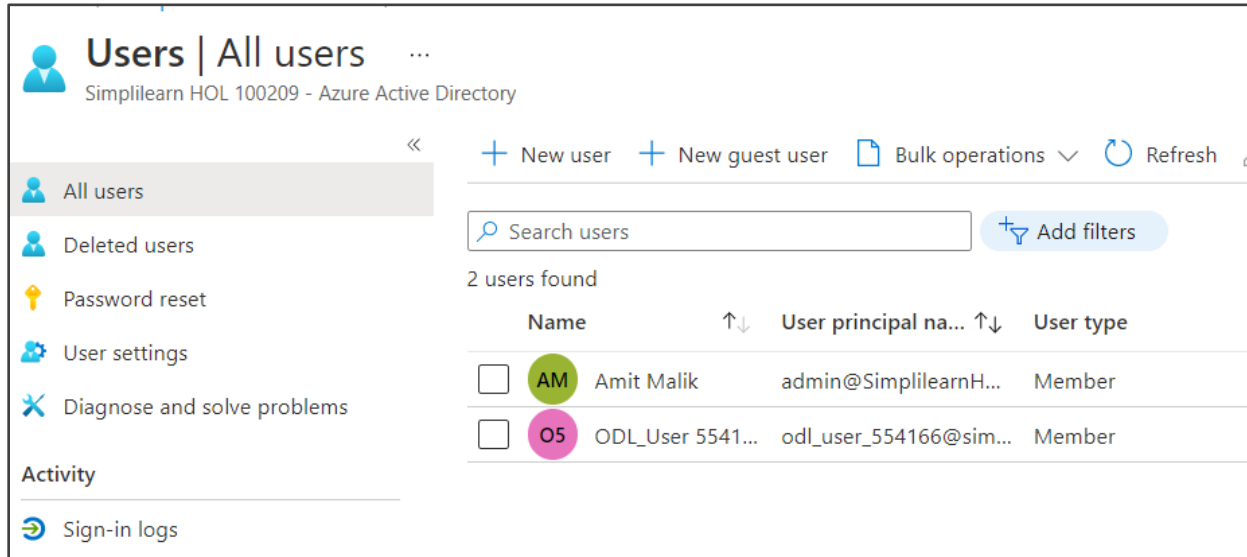
Scope /subscriptions/d8900976-0cbb-41ad-b1f8-4a7568c31c20/resourceGroups/RG01

Create

Previous

Step 5: Adding a User to the Directory and assign the custom RBAC Role

- 5.1 Go to **Active Directory > All Users**
- 5.2 Select **New user**



Users | All users ...

Simplilearn HOL 100209 - Azure Active Directory

« + New user + New guest user Bulk operations Refresh

Search users Add filters

2 users found

	Name	↑↓	User principal na... ↑↓	User type
<input type="checkbox"/>	AM Amit Malik		admin@SimplilearnH...	Member
<input type="checkbox"/>	O5 ODL_User 5541...		odl_user_554166@sim...	Member


Activity

Sign-in logs

5.3 Under **Identity**, provide a username and name

New user

Simplilearn HOL 100209

 Got feedback?

☒

Create user

Create a new user in your organization. user will have a user name like `alice@simplilearnhol100209.onmicrosoft.com`
[I want to create users in bulk](#)



☐


Invite user

Invite a new guest user to collaborate with your organization. The user will be emailed an invitation they can accept in order to begin collaborating.
[I want to invite guest users in bulk](#)

[Help me decide](#)

Identity

User name *  ✓ @ 
The domain name I need isn't shown here

Name *  ✓


First name ✓

Last name

5.4 Copy the auto-generated password and keep it for future use

Password

☒ Auto-generate password
☐ Let me create the password

Initial password 

☒ Show Password

5.5 Select **Create**

5.6 Go to **Resource Group > Access control (IAM)**

5.7 Select Add role assignment

RG01 | Access control (IAM)
...

Resource group

<<
+ Add
↓ Download role assignments
≡ Edit columns
↻ F

Overview

Activity log

Access control (IAM)

Tags

Resource visualizer

Events

Settings

Deployments

Security

Policies

Properties

Add role assignment

Add co-administrator

Add custom role

View my level of access to this resource.

View my access

Check access

Review the level of access a user, group, service principal, or managed identity has to this resource. [Learn more](#)

Find ⓘ

User, group, or service principal

Search by name or email address

Assignments

Roles

Deny assignments

5.8 Under **Role**, select the custom role created in the previous step

Add role assignment

Got feedback?

[Role](#)
[Members](#)
[Review + assign](#)

A role definition is a collection of permissions. You can use the built-in roles or you can create your own custom roles. [Learn more](#)

[Use classic experience](#)

Type : All
Category : All

Showing 1 of 329 roles

Name ↑↓	Description ↑↓
computer operator	

5.9 Go to **Members** > **Select members**. Then, select **test user**

Home > RG01 >

Add role assignment

Got feedback?

[Role](#)
[Members](#)
[Review + assign](#)

Selected role computer operator

Assign access to ☒ User, group, or service principal ☐ Managed identity

Members [+ Select members](#)

Name	Object ID	Type
No members selected		

Description Optional

Select members

Select

Search by name or email address

- Amit Malik
admin@SimplilearnHOL100209.onmicrosoft.com
- anusha (Guest)
anushanunhegde@gmail.com
- ODL_User 554166
odl_user_554166@simplilearnhol100209.onmicrosof...
- user
user@simplilearnhol100209.onmicrosoft.com

Selected members:

- testuser
testuser1@simplilearnhol100209.onm... [Remove](#)

5.10 Select **Review + assign**

5.11 Under **Role assignments**, verify the role that is assigned

Check access **Role assignments** Roles Deny assignments Classic administrators

Number of role assignments for this subscription ⓘ

6 2000

Search by name or email

Type : All Role : All Scope : All scopes Group by : Role

6 items (3 Users, 1 Foreign Principals, 2 Service Principals)

<input type="checkbox"/>	Name	Type	Role	Scope	Condition
▼	Owner				
<input type="checkbox"/>	Amit Malik admin@SimplilearnHOL10020...	User	Owner ⓘ	Subscription (Inherited)	None
<input type="checkbox"/>	Foreign Principal for 'Spektra Sy...	Foreign principal	Owner ⓘ	Subscription (Inherited)	None
<input type="checkbox"/>	https://cloudlabs.ai/	App	Owner ⓘ	Subscription (Inherited)	None
<input type="checkbox"/>	https://simplilearnhol100209.on...	App	Owner ⓘ	Subscription (Inherited)	None
<input type="checkbox"/>	ODL_User 554166 odl_user_554166@simplilearn...	User	Owner ⓘ	Subscription (Inherited)	None
▼	computer operator				
<input type="checkbox"/>	testuser testuser1@simplilearnhol1002...	User	computer operator ⓘ	This resource	None

5.12 Test the user permissions by logging in to the Azure portal with the user ID

5.13 Update the password when prompted

5.14 Restart **vm1**. You should be able to restart the vm

Home > Virtual machines >

» **vm1** ...
Virtual machine

Search (Ctrl+/)

Connect Start Restart Stop Capture

Essentials

Resource group (move)
[RG01](#)

Status
Running

Location
East US

Subscription (move)
[Simplilearn HOL 100109](#)

Subscription ID
25bfb8e9-a3b7-423a-bb4f-30d724fc1bf6

Tags (edit)
[Click here to add tags](#)

Notifications

Simplilearn HOL 100109 Sign out

More events in the activity log →

Restarting virtual machi
Restarting the virtual machine

testuser
testuser@simplilearnhol1001...
[View account](#)
[Switch directory](#) ...

Sign in with a different account

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Networking

Connect

Windows Admin Center (preview)