DEVOPS with MULTI-CLOUD
Practice Tasks

Institute Name : V Cube software solutions
Course : DevOps with Multi-Cloud
Batch : 30
Trainer : Krishna reddy sir

Prepared by : G.Bhavish
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TASK-5 :Network Security Group (NSG) at Subnet Level.

Date : 27/01/26

Objective :-

To configure a Network Security Group (NSG) at the subnet level in Azure to control inbound and outbound traffic for all virtual machines within the subnet, ensuring secure and centralized network access management.

NSG at Subnet Level :-

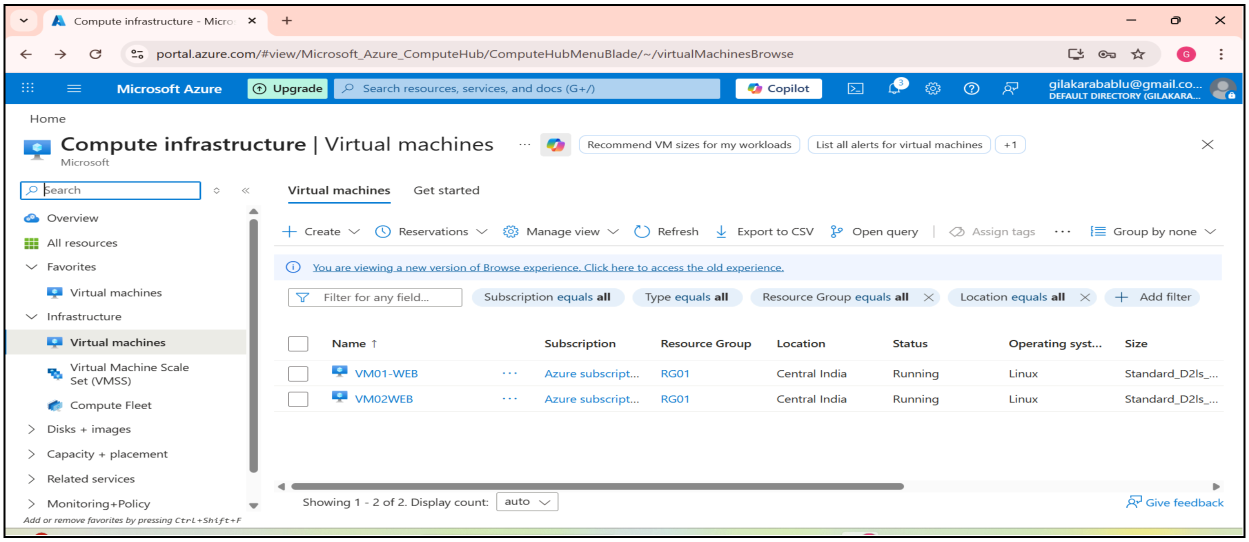
NSG at subnet level is used to control traffic for all virtual machines within a subnet. It provides centralized, tier-based security by allowing or denying inbound and outbound traffic based on defined rules.

→ Create two web virtual machines in a single subnet. While creating, also create a nsg and allow the port numbers 22(ssh) and 80(http).

→ After creating vm's, login to them and install nginx .

→ After successfully installing the nginx just validate by browsing the ip addresses.

→ After validating delete the nsg and create new nsg and add at subnet level.



Compute infrastructure | Virtual machines

Microsoft

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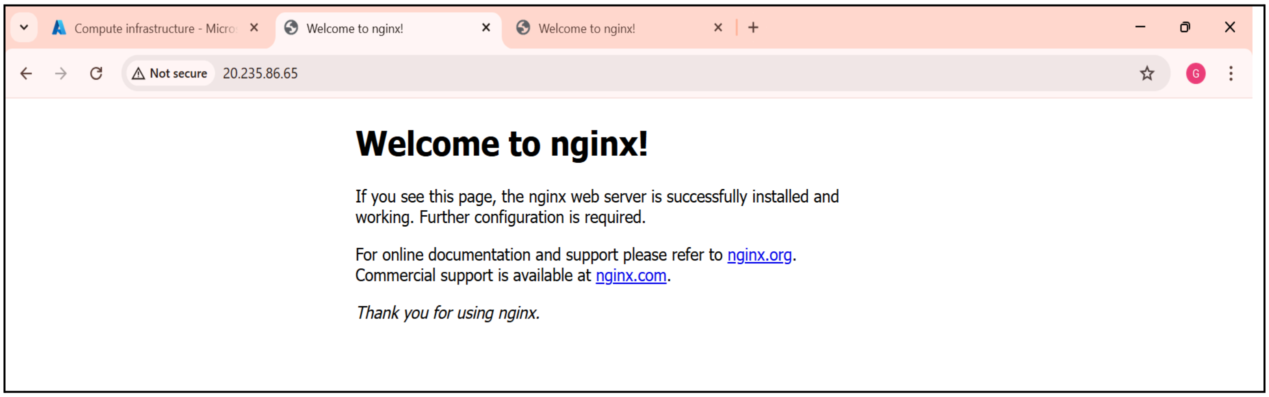
Name ↑	Subscription	Resource Group	Location	Status	Operating syst...	Size
VM01-WEB	Azure subscript...	RG01	Central India	Running	Linux	Standard_D2ls_...
VM02WEB	Azure subscript...	RG01	Central India	Running	Linux	Standard_D2ls_...

Showing 1 - 2 of 2. Display count: auto

fig(1) created two web virtual machines.



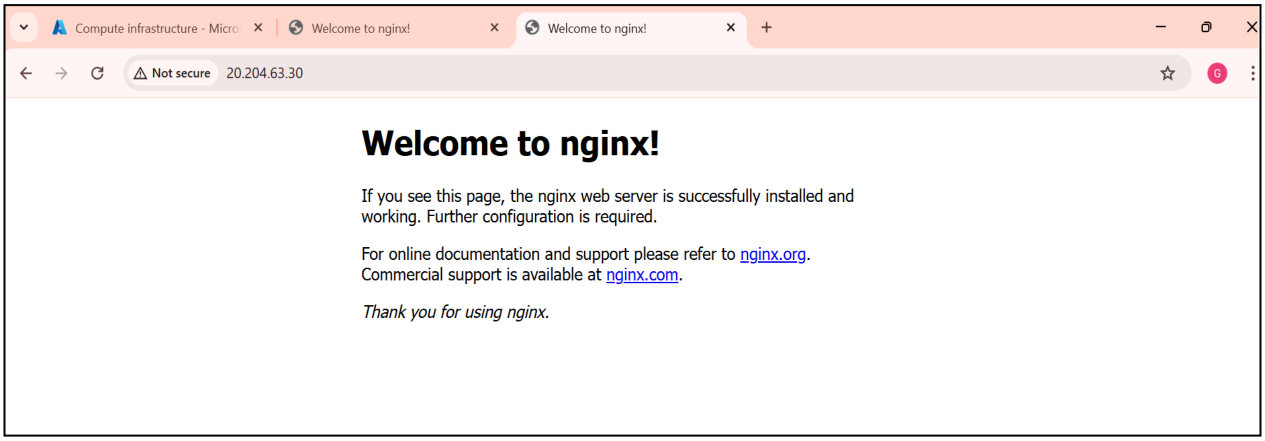
Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

fig(2) successfully installed nginx in webserver-1.



Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

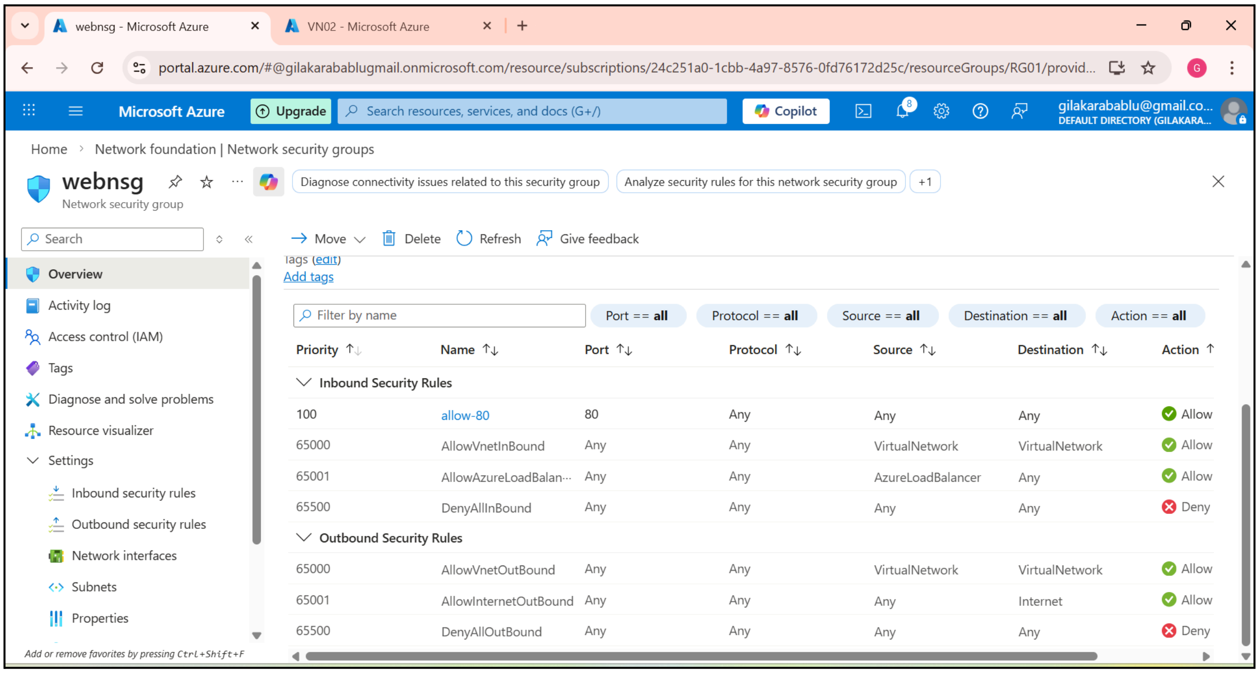
Thank you for using nginx.

fig(3) successfully installed nginx in webserver-2

→ To delete the nsg :-

- First dissociate the nsg from the webservers and later delete the nsg.

→ Create a nsg for the two web servers and add at the subnet level i.e we need to attach the nsg to the subnet of web servers.



webnsg - Microsoft Azure
VN02 - Microsoft Azure
portal.azure.com/#@gilakarababluggmail.onmicrosoft.com/resource/subscriptions/24c251a0-1cbb-4a97-8576-0fd76172d25c/resourceGroups/RG01/provid...
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Home > Network foundation | Network security groups
webnsg
Network security group
Diagnose connectivity issues related to this security group
Analyze security rules for this network security group
+1
Search
Move
Delete
Refresh
Give feedback
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Resource visualizer
Settings
Inbound security rules
Outbound security rules
Network interfaces
Subnets
Properties
Add or remove favorites by pressing Ctrl+Shift+F
Tags (edit)
Add tags
Filter by name
Port == all
Protocol == all
Source == all
Destination == all
Action == all

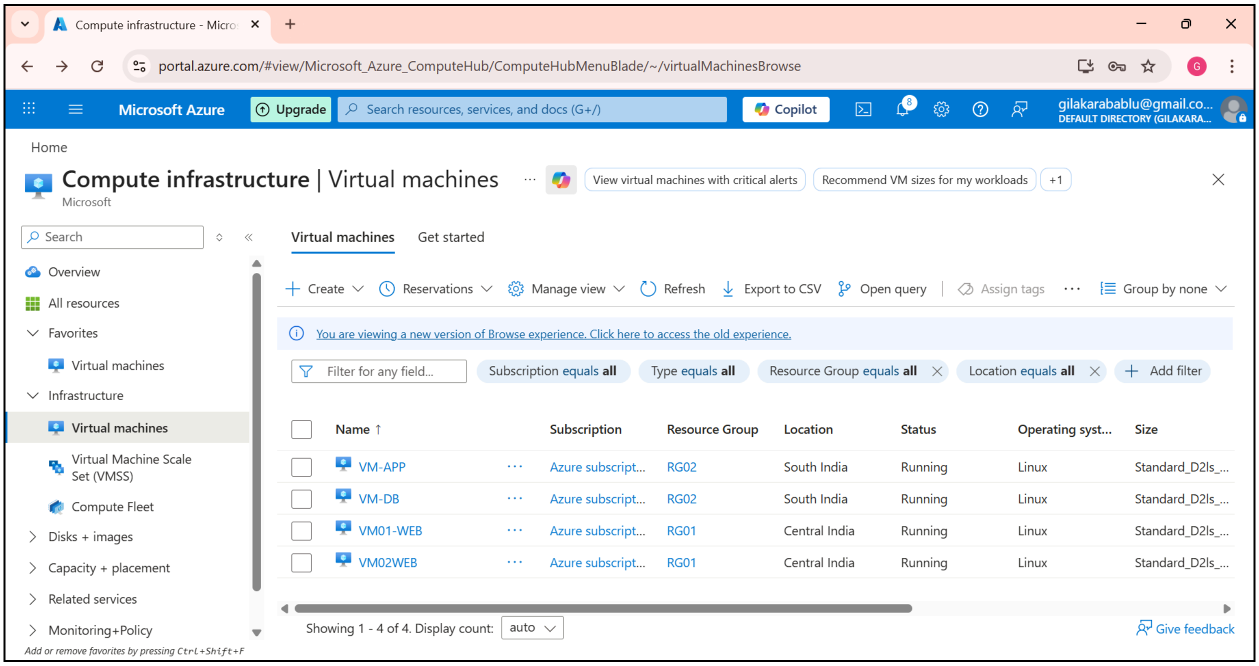
Priority	Name	Port	Protocol	Source	Destination	Action
Inbound Security Rules						
100	allow-80	80	Any	Any	Any	Allow
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalan···	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInBound	Any	Any	Any	Any	Deny
Outbound Security Rules						
65000	AllowVnetOutBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowInternetOutBound	Any	Any	Any	Internet	Allow
65500	DenyAllOutBound	Any	Any	Any	Any	Deny

Fig(4) created nsg for web-servers and attached to subnet level.

→ Now we can browse the web vm's with their ip addresses and we get the nginx web page.

→ Now create the app virtual machine and db virtual machine in two different subnets, since we need to attach the nsg at the subnet level.

→ After creating the virtual machines, also create two nsg's for them and attach the nsg to the respective subnets.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Infrastructure
Virtual machines
Virtual Machine Scale Set (VMSS)
Compute Fleet
Disks + images
Capacity + placement
Related services
Monitoring+Policy
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Reservations
Manage view
Refresh
Export to CSV
Open query
Assign tags
Group by none
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Filter for any field...
Subscription equals all
Type equals all
Resource Group equals all
Location equals all
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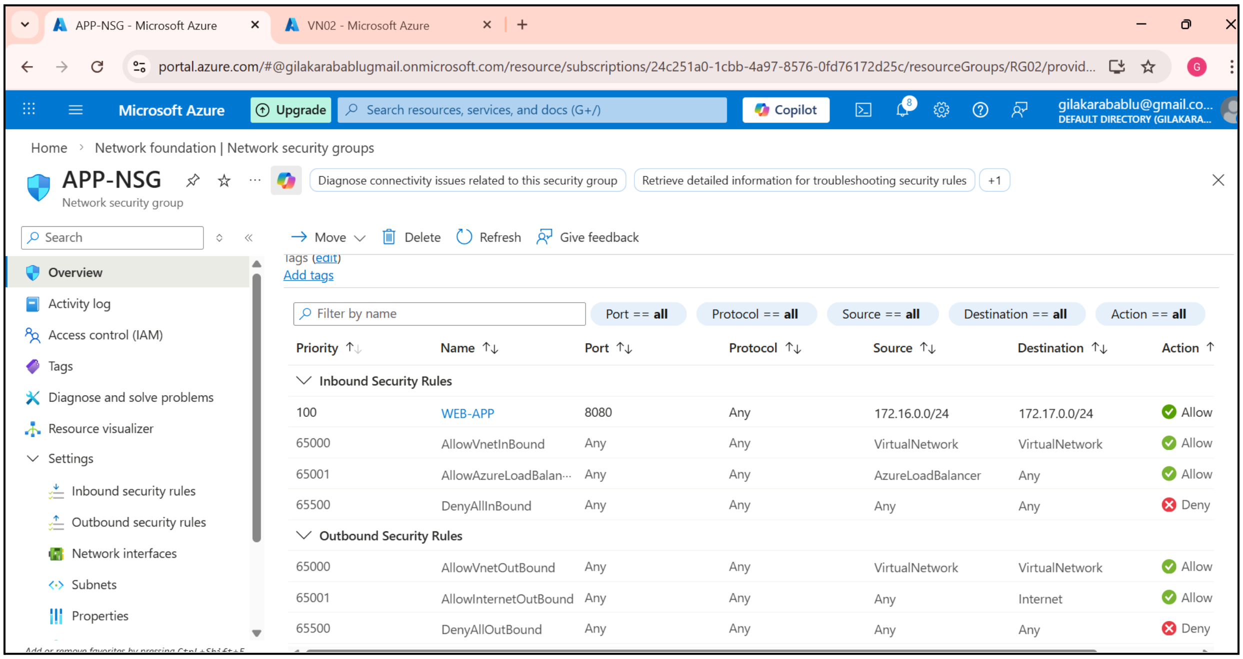
auto
Give feedback

Name ↑	Subscription	Resource Group	Location	Status	Operating syst...	Size
VM-APP	Azure subscript...	RG02	South India	Running	Linux	Standard_D2ls_...
VM-DB	Azure subscript...	RG02	South India	Running	Linux	Standard_D2ls_...
VM01-WEB	Azure subscript...	RG01	Central India	Running	Linux	Standard_D2ls_...
VM02WEB	Azure subscript...	RG01	Central India	Running	Linux	Standard_D2ls_...

fig(5) successfully created an app & db virtual machine.


APP-NSG - Microsoft Azure
VN02 - Microsoft Azure
portal.azure.com/#@gilakarababluggmail.onmicrosoft.com/resource/subscriptions/24c251a0-1cbb-4a97-8576-0fd76172d25c/resourceGroups/RG02/provid...
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DEFAULT DIRECTORY (GILAKARA...
Home > Network foundation | Network security groups
APP-NSG
Network security group
Diagnose connectivity issues related to this security group
Retrieve detailed information for troubleshooting security rules
+1
Search
Overview
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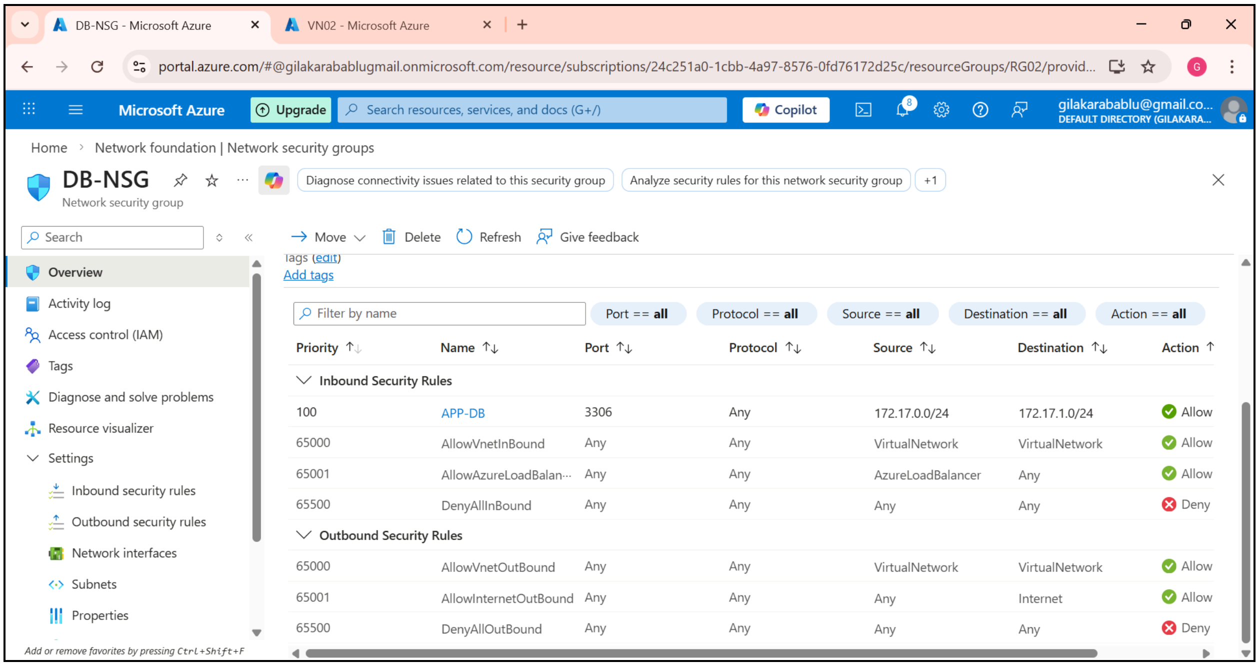
Access control (IAM)
Tags
Diagnose and solve problems
Resource visualizer
Settings
Inbound security rules
Outbound security rules
Network interfaces
Subnets
Properties
Move
Delete
Refresh
Give feedback
Tags (edit)
Add tags
Filter by name
Port == all
Protocol == all
Source == all
Destination == all
Action == all

Priority ↑↓	Name ↑↓	Port ↑↓	Protocol ↑↓	Source ↑↓	Destination ↑↓	Action ↑
Inbound Security Rules						
100	WEB-APP	8080	Any	172.16.0.0/24	172.17.0.0/24	✓ Allow
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	✓ Allow
65001	AllowAzureLoadBalan···	Any	Any	AzureLoadBalancer	Any	✓ Allow
65500	DenyAllInBound	Any	Any	Any	Any	✗ Deny
Outbound Security Rules						
65000	AllowVnetOutBound	Any	Any	VirtualNetwork	VirtualNetwork	✓ Allow
65001	AllowInternetOutBound	Any	Any	Any	Internet	✓ Allow
65500	DenyAllOutBound	Any	Any	Any	Any	✗ Deny

Fig (6) created nsg for the app and attached to it.


DB-NSG - Microsoft Azure
VN02 - Microsoft Azure
portal.azure.com/#@gilakarabablugmail.onmicrosoft.com/resource/subscriptions/24c251a0-1cbb-4a97-8576-0fd76172d25c/resourceGroups/RG02/provid...
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Add or remove favorites by pressing Ctrl+Shift+F
Tags (edit)
Add tags
Filter by name
Port == all
Protocol == all
Source == all
Destination == all
Action == all

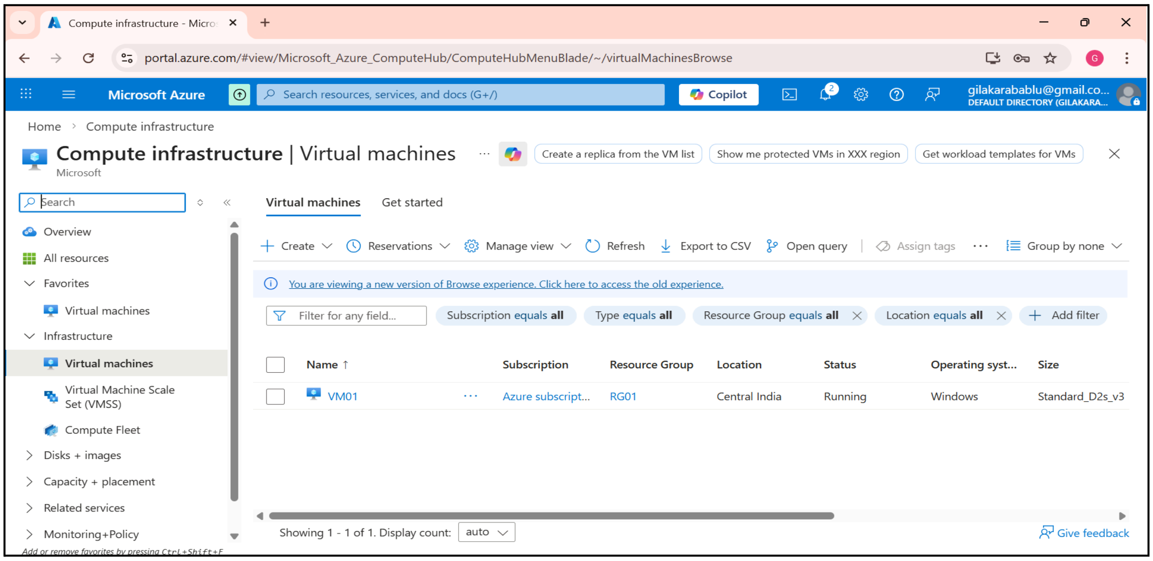
Priority	Name	Port	Protocol	Source	Destination	Action
Inbound Security Rules						
100	APP-DB	3306	Any	172.17.0.0/24	172.17.1.0/24	✓ Allow
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	✓ Allow
65001	AllowAzureLoadBalan···	Any	Any	AzureLoadBalancer	Any	✓ Allow
65500	DenyAllInBound	Any	Any	Any	Any	✗ Deny
Outbound Security Rules						
65000	AllowVnetOutBound	Any	Any	VirtualNetwork	VirtualNetwork	✓ Allow
65001	AllowInternetOutBound	Any	Any	Any	Internet	✓ Allow
65500	DenyAllOutBound	Any	Any	Any	Any	✗ Deny

Fig (7) successfully created nsg for db and attached to it.

Outbound Rules :-

→ The outbound rules control the outbound traffic from the machines.

→ Create a windows virtual machine.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Infrastructure
Virtual machines
Virtual Machine Scale Set (VMSS)
Compute Fleet
Disks + images
Capacity + placement
Related services
Monitoring+Policy
Add or remove favorites by pressing Ctrl+Shift+F
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Manage view
Refresh
Export to CSV
Open query
Assign tags
Group by none
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Resource Group equals all
Location equals all
Add filter
Showing 1 - 1 of 1. Display count: auto
Give feedback

Name ↑	Subscription	Resource Group	Location	Status	Operating syst...	Size
VM01	Azure subscript...	RG01	Central India	Running	Windows	Standard_D2s_v3

fig(8) created a windows virtual machine.

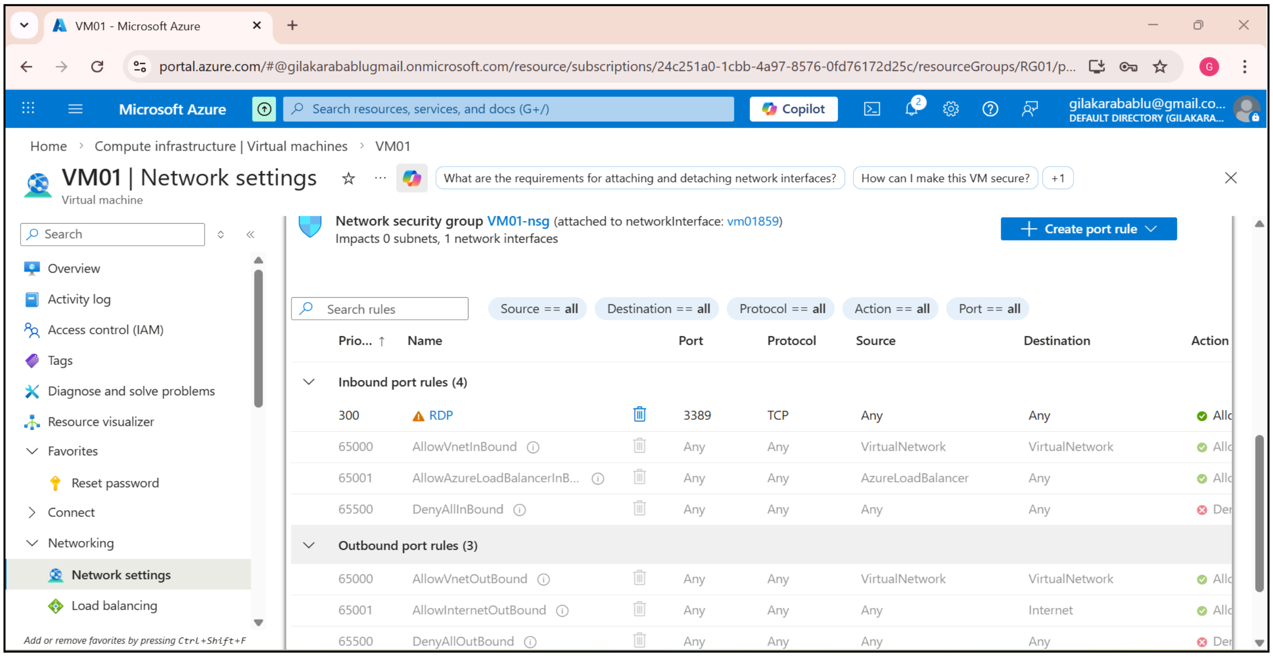
→ We will use the RDP tool to login to the windows machine.

→ Since the internet is defaultly allowed in the outbound rules when created the nsg, and we can't delete or change it, so we will add another outbound rule with higher priority. Lower the number higher the priority.

Add a outbound rule :-

Source	: any.
Destination	: service tag.
Destination service tag	: Internet.
Destination port range	: * (indicates any)

Service tag :- The Azure added some tags where we can select them to write the rules.


VM01 - Microsoft Azure
portal.azure.com/#@gilakarabablugmail.onmicrosoft.com/resource/subscriptions/24c251a0-1cbb-4a97-8576-0fd76172d25c/resourceGroups/RG01/p...
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DEFAULT DIRECTORY (GILAKARA...
Home › Compute infrastructure | Virtual machines › VM01
VM01 | Network settings
Virtual machine
What are the requirements for attaching and detaching network interfaces?
How can I make this VM secure?
+1
Search
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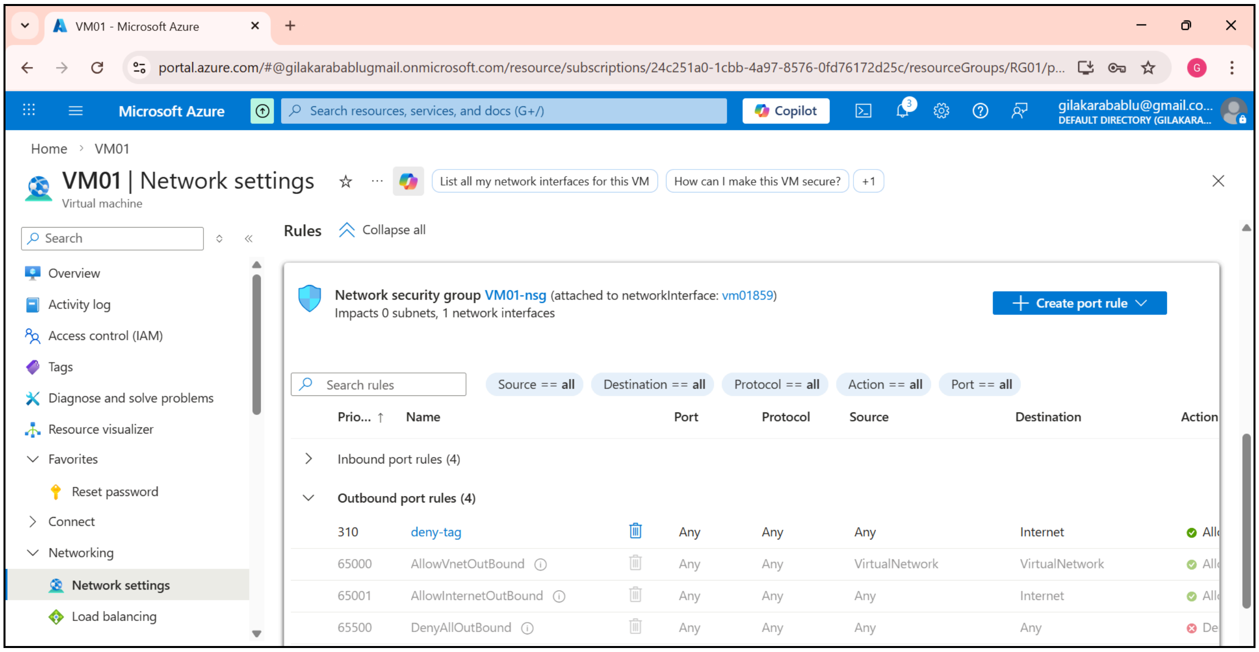
Tags
Diagnose and solve problems
Resource visualizer
Favorites
Reset password
Connect
Networking
Network settings
Load balancing
Add or remove favorites by pressing Ctrl+Shift+F
Create port rule
Search rules
Source == all
Destination == all
Protocol == all
Action == all
Port == all

Network security group VM01-nsg (attached to networkInterface: vm01859)
Impacts 0 subnets, 1 network interfaces

Prio... ↑	Name	Port	Protocol	Source	Destination	Action
Inbound port rules (4)						
300	RDP	3389	TCP	Any	Any	Allo
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	Allo
65001	AllowAzureLoadBalancerInB...	Any	Any	AzureLoadBalancer	Any	Allo
65500	DenyAllInBound	Any	Any	Any	Any	Der
Outbound port rules (3)						
65000	AllowVnetOutBound	Any	Any	VirtualNetwork	VirtualNetwork	Allo
65001	AllowInternetOutBound	Any	Any	Any	Internet	Allo
65500	DenyAllOutBound	Any	Any	Any	Any	Der

Fig (9) successfully added RDP port no. in nsg



Network security group VM01-nsg (attached to networkInterface: vm01859)
Impacts 0 subnets, 1 network interfaces

Inbound port rules (4)

Outbound port rules (4)

Prio... ↑	Name	Port	Protocol	Source	Destination	Action
310	deny-tag	Any	Any	Any	Internet	All
65000	AllowVnetOutBound	Any	Any	VirtualNetwork	VirtualNetwork	All
65001	AllowInternetOutBound	Any	Any	Any	Internet	All
65500	DenyAllOutBound	Any	Any	Any	Any	De

Fig (10) successfully added a service tag and denied the internet.