

DEVOPS with MULTI-CLOUD

Practice Tasks

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Course : DevOps with Multi-Cloud
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TASK-4 : Network Security Group(NSG).

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Objective :-

The objective of this task is to configure a Network Security Group (NSG) in Azure to control inbound and outbound network traffic. This helps secure Azure resources by allowing or denying traffic based on defined security rules.

Network Security Group(NSG) :-

An Azure Network Security Group (NSG) is a security service that filters network traffic to and from Azure resources. It uses rules based on IP address, port, and protocol to allow or deny traffic within a virtual network.

NSG can be applied at two levels :-

- 1. NIC Level :-** NSG at NIC level is applied directly to a virtual machine's network interface card and controls traffic for that specific VM only. VM-specific security when individual machines require different access rules than the rest of the subnet.
- 2. 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.

NSG at NIC Level :-

→ Create a Resource Group RG01.

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes tabs for 'Devops Cloud Task 26-1 - Google', 'Devops Cloud Task 23-1 - Google', and 'RG01 - Microsoft Azure'. The main title is 'Welcome to nginx!'. Below the title, there's a search bar and a Copilot button. The left sidebar is titled 'RG01' and lists various resource management options like Activity log, Access control (IAM), Tags, Resource visualizer, Events, Settings, Cost Management, Monitoring, Automation, and Help. The main content area is titled 'Overview' under 'Essentials' and shows a table of resources:

Name	Type	Location
VM01	Virtual machine	Central India
VM01-ip	Public IP address	Central India
VM01-nsg	Network security group	Central India
vm01970	Network Interface	Central India
VM01_OsDisk_1	Disk	Central India
VN01	Virtual network	Central India

fig(1) Resource group created.

→ Create a Virtual Network VN01 and also a Sub Net SN01.

- Search virtual network and create virtual network vn01.
- While creating a virtual network by default one subnet is created, rename the subnet to sn01.

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes tabs for 'Devops Cloud Task 26-1 - Google', 'Devops Cloud Task 23-1 - Google', 'VN01 - Microsoft Azure', and 'Welcome to nginx!'. The main title is 'Microsoft Azure' with a search bar 'Search resources, services, and docs (G+)'. On the right, there are icons for Copilot, a profile picture, and a lock. The user email 'gilakarabablu@gmail.com...' and 'DEFAULT DIRECTORY (GILAKARA...)' are also visible.

The left sidebar shows a tree view with 'VN01' selected under 'Virtual network'. Other options include 'Activity log', 'Access control (IAM)', 'Tags', 'Diagnose and solve problems', 'Resource visualizer', 'Favorites' (with 'Subnets', 'Address space', and 'Peerings'), 'Settings', and 'Monitoring'. A note at the bottom says 'Add or remove favorites by pressing Ctrl+Shift+F'.

The main content area is titled 'VN01' and 'Virtual network'. It contains sections for 'Overview', 'Essentials', and 'Tags'. Under 'Overview', there are links for 'Move', 'Delete', 'Refresh', and 'Give feedback'. The 'Essentials' section provides detailed information:

Resource group (move)	RG01
Location (move)	Central India
Subscription (move)	Azure subscription 1
Subscription ID	24c251a0-1cbb-4a97-8576-0fd76172d25c
Address space	172.16.0.0/16
Subnets	1 subnet
DNS servers	Azure provided DNS service
BGP community string	Configure
Virtual network ID	fe83646b-2bba-4cdc-a0a7-47ad9441e00c

Under 'Tags', there are buttons for '(edit)' and 'Add tags'.

fig(2) virtual network and subnet created.

→ Create a Virtual Machine VM01.

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes tabs for 'Devops Cloud Task 26-1 - Google', 'Devops Cloud Task 23-1 - Google', 'VM01 - Microsoft Azure', and 'Welcome to nginx!'. The main title is 'Microsoft Azure' with a search bar 'Search resources, services, and docs (G+)'. On the right, there are icons for Copilot, a profile picture, and a lock. The user email 'gilakarabablu@gmail.com...' and 'DEFAULT DIRECTORY (GILAKARA...)' are also visible.

The left sidebar shows a tree view with 'VM01' selected under 'Virtual machine'. Other options include 'Activity log', 'Access control (IAM)', 'Tags', 'Diagnose and solve problems', 'Monitor', 'Resource visualizer', 'Favorites' (with 'Reset password'), 'Connect' (with 'Connect' and 'Bastion'), and 'Bastion'. A note at the bottom says 'Add or remove favorites by pressing Ctrl+Shift+F'.

The main content area is titled 'VM01' and 'Virtual machine'. It contains sections for 'Overview', 'Help me copy this VM in any region', and 'Essentials'. Under 'Overview', there are buttons for 'Connect', 'Start', 'Restart', 'Stop', 'Hibernate', 'Capture', 'Delete', 'Refresh', 'Scale', 'Open in mobile', and '...'. The 'Help me copy this VM in any region' button is highlighted.

The 'Essentials' section provides detailed information:

Resource group (move)	RG01
Status	Running
Location	Central India
Subscription (move)	Azure subscription 1
Subscription ID	24c251a0-1cbb-4a97-8576-0fd76172d25c
Operating system	Linux (ubuntu 24.04)
Size	Standard D2ls v5 (2 vcpus, 4 GiB memory)
Primary NIC public IP	104.211.102.53
1 associated public IPs	
Virtual network/subnet	VN01/SN01
DNS name	Not configured
Health state	

fig(3) virtual machine created.

→ How to Create a NSG and associate with the virtual machine :

- Search nsg and create a nsvvm01
- Open that nsg and add inbound rules, allowing port numbers 22 & 80.
- Goto network interface and associate this nsg to the virtual machine vm01.

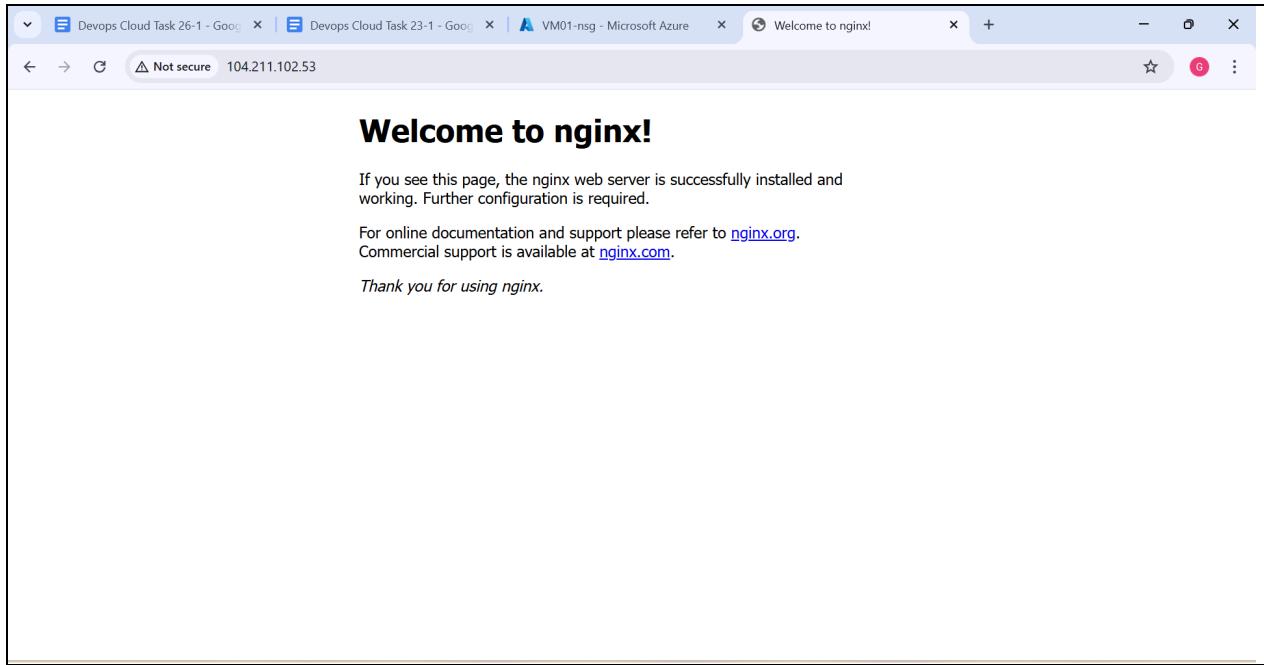
Priority	Name	Port	Protocol	Source	Destination	Action
300	HTTP	80	TCP	Any	Any	Allow
320	SSH	22	TCP	Any	Any	Allow
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBal...	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInBound	Any	Any	Any	Any	Deny
65000	AllowVnetOutBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowInternetOutBound	Any	Any	Any	Internet	Allow
65500	DenyAllOutBound	Any	Any	Any	Any	Deny

fig(4) NSG is created and associated to VM01.

→ Now login to the machine and install nginx with following commands :-

- sudo su
- apt update
- apt install nginx -y

→ Now we can browse with the vm ip address we will get the below nginx web page.



fig(5) Nginx is successfully installed.

→ Therefore NSG is successfully created and applied at the nic level.