

Placement Empowerment Program

Cloud Computing and DevOps Centre

Create a virtual private network in cloud: Add a subnets and configure routetable between the subnets.

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Introduction:

Creating a Virtual Private Network (VPN) in the cloud involves setting up a Virtual Network (VNet) to securely connect cloud resources with on-premises infrastructure. By dividing the VNet into multiple subnets, you can organize resources based on their functionality (e.g., web servers, application servers, and databases) while applying security controls to each subnet. Configuring route tables is essential to manage traffic flow, enabling communication between subnets and directing traffic to external destinations, like the internet or on-premises networks through a VPN Gateway. This setup ensures secure, efficient, and scalable network traffic management, facilitating a hybrid architecture that integrates on-premises and cloud resources.

Objective:

The goal is to:

Set up a Virtual Network (VNet) in the cloud to provide secure communication between cloud resources.

Divide the VNet into subnets to logically separate resources based on their functionality (e.g., web, app, database servers).

Configure route tables to control and manage traffic flow between subnets and external networks.

Enable secure communication between on-premises infrastructure and cloud resources via a VPN Gateway.

Apply security policies like Network Security Groups (NSGs) to control access and traffic within each subnet.

Optimize network performance by organizing resources into subnets and routing traffic efficiently based on business needs.

Ensure scalability and flexibility in network design to support growing cloud-based applications and hybrid architectures.

Provide hybrid connectivity for integrating on-premises networks with cloud environments securely.

Step-by-Step Procedure:

STEP 1: *Create a virtual private network*

Microsoft Azure | Upgrade | Search resources, services, and docs (G+)

Home > Virtual networks > Create virtual network

Basics | Security | IP addresses | Tags | Review + create

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

Subscription * | Free Trial | Resource group * | anu | Create new

Instance details

Virtual network name * | vnet1 | Region * | (Asia Pacific) Japan East | Deploy to an Azure Extended Zone

Previous | Next | Review + create | Give feedback

STEP 2: Add two subnets with two different ip-address

Microsoft Azure | Upgrade | Search resources, services, and docs (G+)

Home > Virtual networks > Create virtual network

Basics | Security | IP addresses | Tags | Review + create

Configure your virtual network address space with the IPv4 and IPv6 addresses and Define the address space of your virtual network with one or more IPv4 or IPv6 address space into smaller ranges for use by your applications. When you assign the resource an IP address from the subnet. Learn more

+ Add a subnet

10.0.0.0/16
This address prefix overlaps with virtual network 'vm1-vnet'. If you intend to use this address space, you must specify a different address space. Learn more

10.0.0.0 /16
10.0.0.0 - 10.0.255.255 65,536 addresses

Add a subnet

Select an address space and configure your subnet. You can customize a default subnet or select from subnet templates if you plan to add select services later. Learn more

Subnet purpose | Default | Name * | subnet1

IPv4

Include an IPv4 address space | ☒ | IPv4 address range | 10.0.0.0/16 | 10.0.0.0 - 10.0.255.255 | Starting address * | 10.0.2.0 | Size | /24 (256 addresses) | Subnet address range | 10.0.2.0 - 10.0.2.255

IPv6

Include an IPv6 address space | ☐ This virtual network has no IPv6 address ranges.

Add | Cancel | Give feedback

Microsoft Azure | Upgrade | Search resources, services, and docs (G+)

Home > Virtual networks > Create virtual network

Basics Security **IP addresses** Tags Review + create

Subnets	IP address range	Size	NAT gateway
default	10.0.0.0 - 10.0.0.255	/24 (256 addresses)	-
AzureFirewallSubnet	10.0.1.0 - 10.0.1.63	/26 (64 addresses)	-
subnet1	10.0.2.0 - 10.0.2.255	/24 (256 addresses)	-
subnet2	10.0.3.0 - 10.0.3.255	/24 (256 addresses)	-

Add IPv4 address space

Previous Next **Review + create**

STEP 3: deploy the vnet and configure the changes

Microsoft Azure | Upgrade | Search resources, services, and docs (G+)

Home > vnet1 Virtual network

Search

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Settings Monitoring Automation Help

Move Delete Refresh Give feedback

Essentials

Resource group (...): anu
Location (move): Japan East
Subscription (move): Free Trial
Subscription ID: db4b622d-505c-426a-91e9-10d26086d14f

Address space: 10.0.0.0/16
DNS servers: Azure provided DNS service
Flow timeout: Configure
BGP community string: Configure
Virtual network ID: ee5677b0-800d-4fa1-a6bf-58a674565fbf

Tags (edit): Add tags

Topology Properties **Capabilities (5)** Recommendations Tutorials

DDoS protection: Configure additional protection from distributed denial of service attacks. Not configured

Azure Firewall: Protect your network with a stateful L3-L7 firewall. VN1-FIREWALL

Peerings: Seamlessly connect two or more virtual networks. Not configured

STEP 4: create a route table to connect two subnets inside that to partition the network among the subnets to manage the incoming traffic

azure portal login - Search x Create Route table - Micro x chatgpt - Search x chatgpt - Search x VM Snapshot and Restore x

https://portal.azure.com/#create/Microsoft.RouteTable-ARM

Microsoft Azure Upgrade Search resources, services, and docs (G+/) Copilot subiksharamesh2312@... DEFAULT DIRECTORY (SUBIKSHA...)

Home > Route tables >

Create Route table

Basics Tags Review + create

Project details

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

Subscription * ⓘ Free Trial

Resource group * ⓘ anu
[Create new](#)

Instance details

Region * ⓘ East US

Name * ⓘ route1

Propagate gateway routes * ⓘ ☒ Yes ☐ No

[Previous](#) [Next](#) [Review + create](#) [Give feedback](#)

STEP 5: add routes ,give the subnet2-ip in the destination port

azure portal login - Search x Add route - Microsoft Azure x chatgpt - Search x chatgpt - Search x VM Snapshot and Restore x

https://portal.azure.com/#@subiksharamesh2312gmail.onmicrosoft.com/resource/subscriptions/db4b622d-505c-426a-91e9...

Microsoft Azure Upgrade Search resources, services, and docs (G+/) Copilot subiksharamesh2312@... DEFAULT DIRECTORY (SUBIKSHA...)

Home > Route tables > route1

Route tables

Default Directory (subiksharamesh2312gmail.onm...

[+ Create](#) [Manage view](#) > >

Filter for any field...

Name ↑↓

- route1
- vnetroute

Page 1 of 1

route1 | Routes

Route table

routes

[+ Add](#) [Refresh](#)

Settings

Routes

Help

Effective routes

Search routes

Name ↑↓

No results.

Add route

route1

A user defined route (UDR) is a static route that overrides Azure's default system routes, or adds a route to a subnet's route table. [Learn more](#)

Route name * rou1

Destination type * ⓘ IP Addresses

Destination IP addresses/CIDR ranges * ⓘ 10.0.3.0/24

Next hop type * ⓘ None

Next hop address ⓘ

[Add](#) [Give feedback](#)

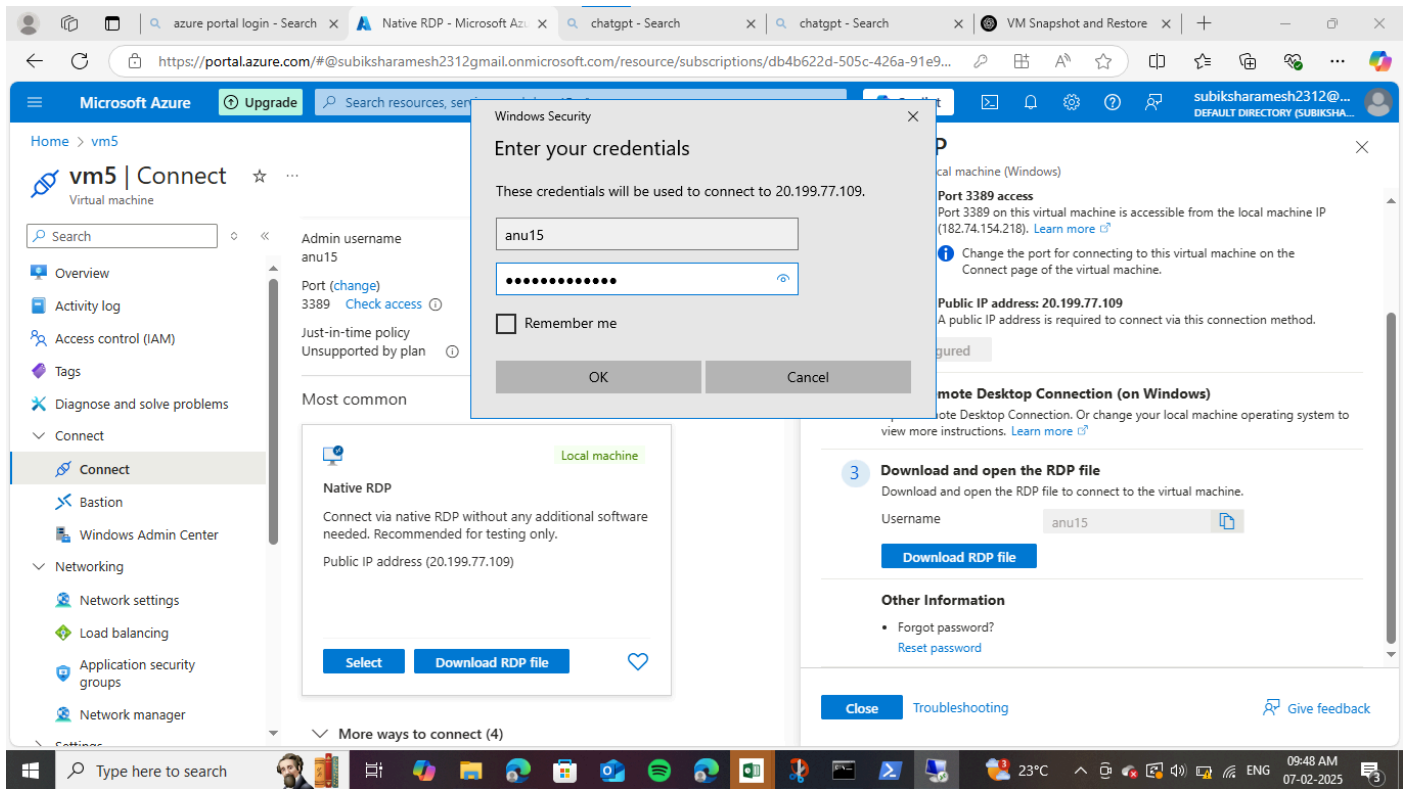
Microsoft Azure portal screenshot showing the configuration of a route table named 'route1'. The interface includes a left sidebar with navigation options like 'Overview', 'Activity log', 'Access control (IAM)', 'Tags', 'Diagnose and solve problems', 'Settings', 'Monitoring', 'Automation', and 'Help'. The main content area displays the 'Essentials' section for 'route1', showing details such as Resource group (anu), Location (East US), Subscription (db4b622d-505c-426a-91e9-10d26086d14f), and Subscription ID. Below this, there are sections for 'Routes' and 'Subnets', both with search filters and no results displayed. The bottom of the screen shows the Windows taskbar with various application icons and system status indicators.

STEP 6: Attach network-security groups to allow the incoming traffic in the vnet, add icmp rule port

Microsoft Azure portal screenshot showing the configuration of network security groups. The interface displays a list of network security groups (msg1, vm1-nsg, vm2-nsg, vm5-nsg) with columns for Name, Resource group, Location, Subscription, and Flow log. The 'vm1-nsg' is highlighted. The bottom of the screen shows the Windows taskbar with various application icons and system status indicators.

Name	Resource group	Location	Subscription	Flow log
msg1	anu	Japan East	Free Trial	...
vm1-nsg	anu	Japan East	Free Trial	...
vm2-nsg	subi	South India	Free Trial	...
vm5-nsg	anu	France Central	Free Trial	...

STEP 7: Connect the created vm inside the vnet to remote-desktop connection using your credentials



Outcome:

By completing this task, I learned:

Secure Connectivity: Establish a secure connection between cloud resources and on-premises infrastructure through a VPN Gateway.

Network Segmentation: Efficiently segment cloud resources into subnets, enhancing security, and improving traffic management by isolating different parts of the network.

Controlled Traffic Flow: Effective routing of traffic between subnets and external networks, ensuring optimized data flow and proper access control.

Enhanced Security: Implement security controls such as Network Security Groups (NSGs) and route tables to enforce access restrictions and secure communication.

Scalable Architecture: Ability to scale the network design to accommodate growing cloud workloads while maintaining high availability and security.

Hybrid Network Integration: Seamless integration of on-premises and cloud networks, enabling a hybrid environment with secure communication across both infrastructures.

Simplified Network Management: Clear organization of resources and traffic flow, improving manageability and troubleshooting of network issues.