Azure Networking

Basics of Azure Networking

- Basics of Azure Networking focuses on isolating, securing, and scaling communications for resources within the cloud.

- A Virtual Network (VNet), Subnet, Network Security Group (NSG), and DNS are discussed with practical examples.

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1. Virtual Networks

What is a VNet?

- A Virtual Network (VNet) is an independent autonomous network inside Azure for communication between VMs, databases, and other Azure services.
- VNets can connect to on-premises networks through VPN or ExpressRoute network types.

Features:

- Customize IP address ranges.
- Supports subnets to isolate individuals within a network.
- Allows communication between VNets by peering.

Example: Creating a VNet using Azure CLI

```
az network vnet create \
    --name MyVNet \
--resource-group NetworkRG \
--address-prefix 10.0.0.0/16 \
--subnet-name DefaultSubnet \
--subnet-prefix 10.0.1.0/24
```

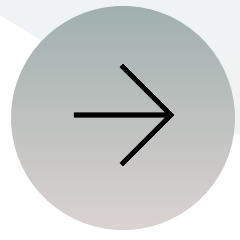
2. Subnets

What are Subnets?

- Subnets form a part of your virtual network where you can build sub-networks to separate resources for management, security, and routing.

Features:

- Determine the range of addresses inside the VNet.
- A subnet can have its own Network Security Group (NSG) which can be used to filter traffic that is sent to and from the subnet.



2. Subnets

Provide security options for the subnet-related services i.e. Azure Kubernetes Services (AKS).

Example: Adding a Subnet

```
az network vnet subnet create \
    --vnet-name MyVNet \
    --resource-group NetworkRG \
    --name WebSubnet \
    --address-prefix 10.0.2.0/24
```

3. Network Security Groups (NSGs)

What is an NSG?

- An NSG is a firewall functioning on the NIC level that allows or blocks the in and out based on the applied rules.

Key Features

- You can use rules to filter your network using the protocol, destination, source, or port.

- The built-in rules enable intra-VNet traffic and disallow incoming traffic from the internet.

Example: Creating an NSG and Adding Rules

Create an NSG:

```
az network nsg create \
    --name MyNSG \
    --resource-group NetworkRG
```

Add an Inbound Rule (Allow HTTP Traffic):

```
az network nsg rule create \
    --nsg-name MyNSG \
    --resource-group NetworkRG \
    --name AllowHTTP \
    --priority 100 \
    --protocol Tcp \
    --destination-port-ranges 80 \
    --access Allow
```

Associate the NSG with a Subnet:

```
az network vnet subnet update \
    --vnet-name MyVNet \
    --name WebSubnet \
    --resource-group NetworkRG \
    --network-security-group MyNSG
```

4. DNS

What is Azure DNS?

Azure DNS is a hosting service for domain name resolution, allowing custom domains to point to Azure resources.

Features:

- Offers high availability and global reach.
- Integrates well with Azure Traffic Manager for geo-routing.

Example: Hosting a Domain in Azure DNS

Create a DNS Zone:

```
az network dns zone create \
--name mydomain.com \
--resource-group NetworkRG
```

Add an A Record:

```
az network dns record-set a add-record
--zone-name mydomain.com
--resource-group NetworkRG
--record-set-name www
--ipv4-address <VM_Public_IP>
```