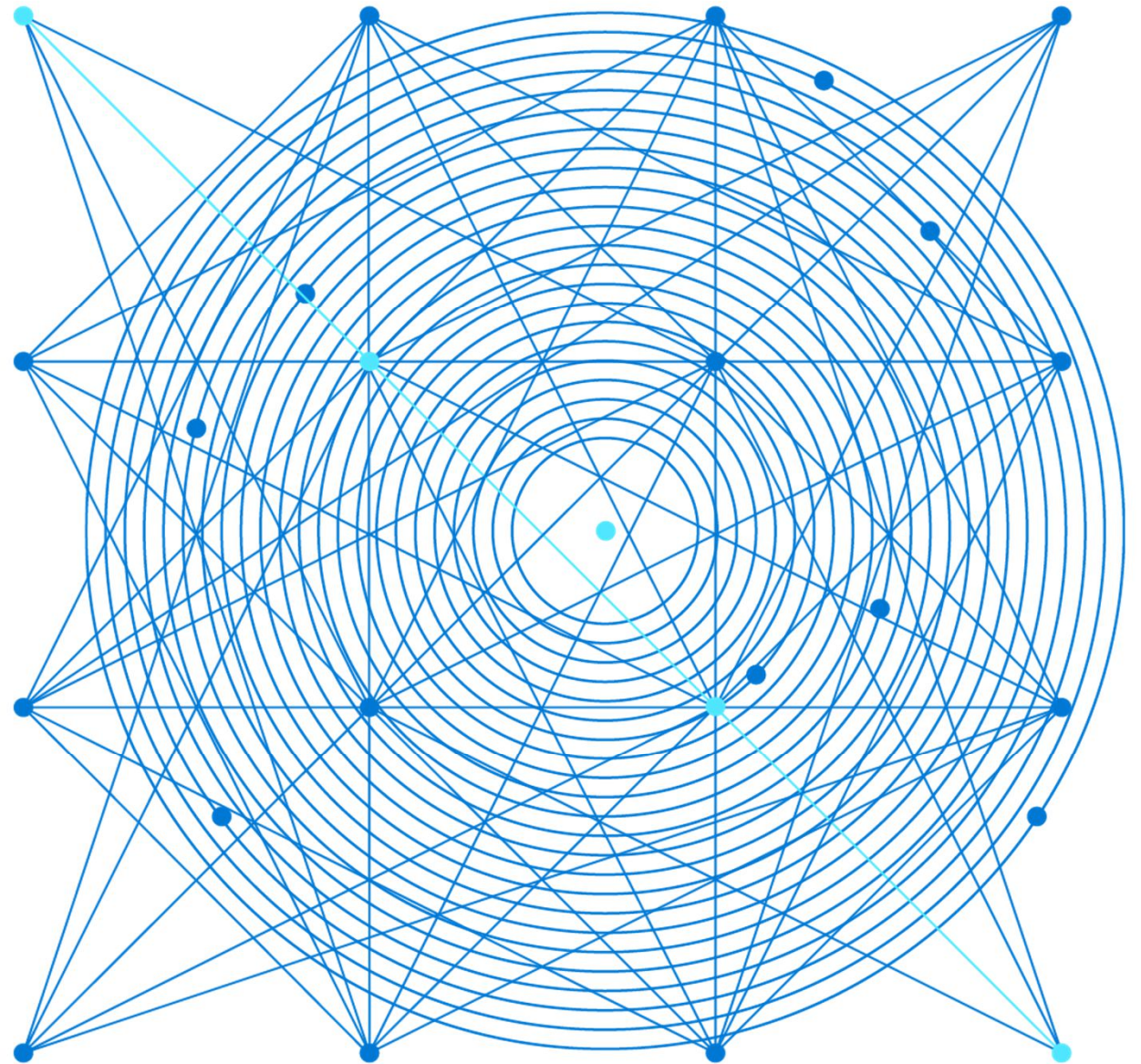


AZ-303: Microsoft Azure Architect Technologies



Module 3: Module 1: Implement Virtual Networking

Virtual networks and virtual network peering

Learning Objectives

You will learn the following concepts:

- Virtual Networking
- Virtual network Peering
- Implement VNet Peering



Virtual Networking



Azure Virtual Networking (1 of 3)

Virtual network concepts:

- Address space
- Subnets
- Regions
- Subscription

Best practices:

- Ensure non-overlapping address spaces
- Don't cover the entire VNet address space
- Configure a few larger VNets (rather than many small ones)
- Secure VNets by assigning NSGs to subnets



Azure Virtual Networking (2 of 3)

Communicate with the Internet:

- Outbound traffic is allowed by default
- Inbound traffic can be provided via:
 - A public IP address
 - A public load balancer

Communicate between Azure resources:

- Through a virtual network
- Through a virtual network service endpoint and/or private endpoint
- Through VNet Peering

Communicate with on-premises resources:

- Point-to-site VPN
- Site-to-site VPN
- Azure ExpressRoute



Azure Virtual Networking (3 of 3)

Filter network traffic:

- Network Security groups
- Network virtual appliances

Route network traffic:

- Route tables
- BGP routes

Virtual network integration for Azure services:

- Deploy dedicated instances of the service into a VNet
- Use Private Link
- Use service endpoints



Comparison of Virtual Network Peering and VPN Gateways (1 of 2)

Virtual Network peering and VPN gateways support connecting:

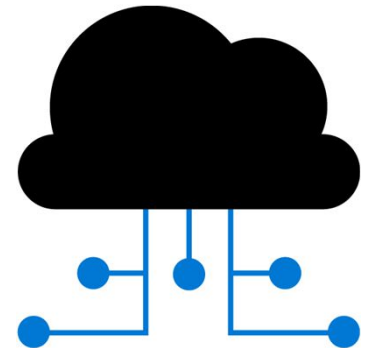
- Virtual networks in different regions
- Virtual networks in different Azure Active Directory tenants
- Virtual networks in different Azure subscriptions
- Virtual networks that use a mix of Azure deployment models



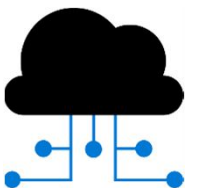
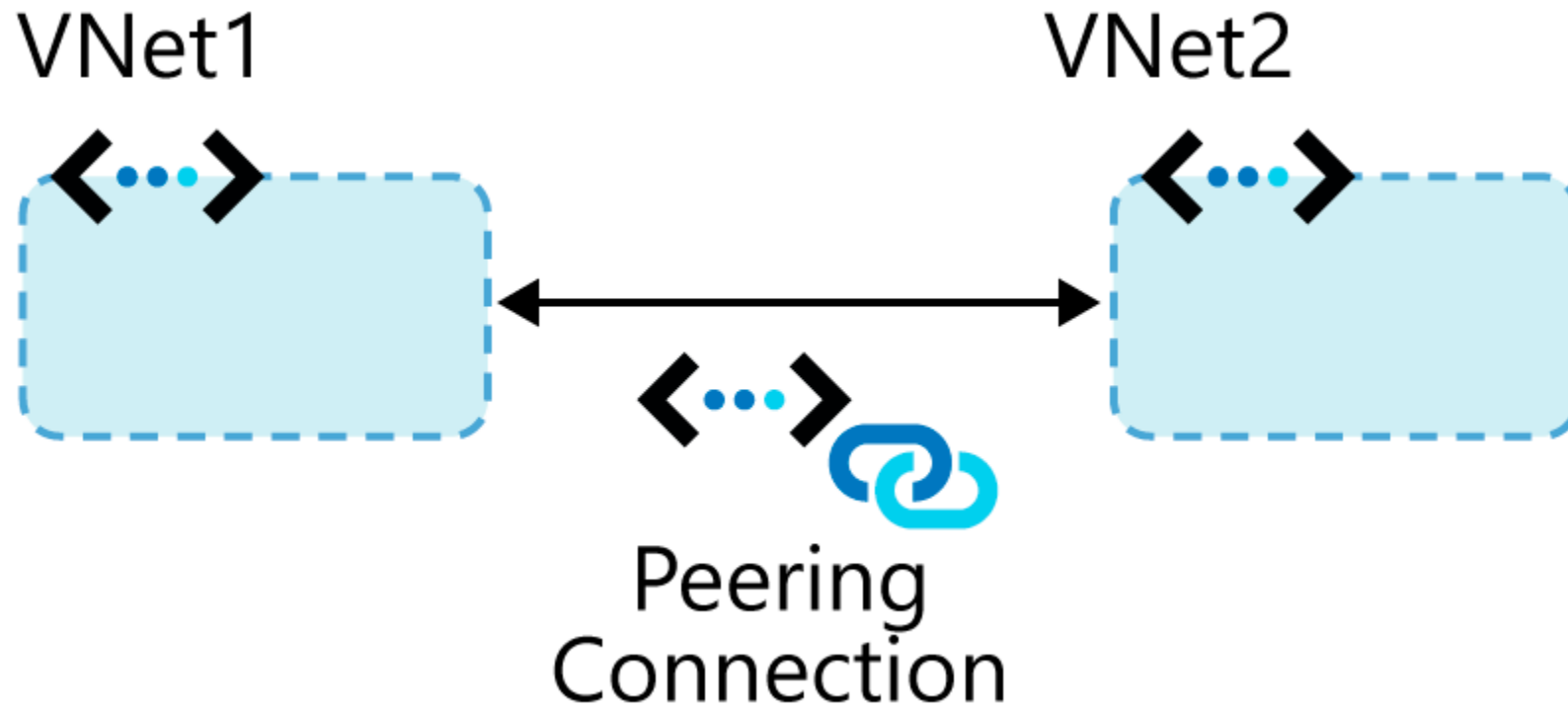
Comparison of Virtual Network Peering and VPN Gateways (2 of 2)

Item	Virtual network peering	VPN Gateway
Limits	Up to 500 per VNet	One per VNet (per gateway limits are SKU-dependent)
Pricing model	Ingress/Egress	Hourly + Egress
Encryption	Not included	IPsec/IKE
Bandwidth	No limits	SKU-dependent
Public endpoints	No	Yes
Transitivity	No	Yes (routing dependent)
Initial setup time	Fast	~30 minutes
Typical scenarios	Data replication, database failover, and other scenarios needing frequent backups of large data.	Encryption-specific scenarios that are not latency sensitive and do not need high throughput.

Virtual Network Peering



Connect Services with Virtual Network Peering (1 of 2)



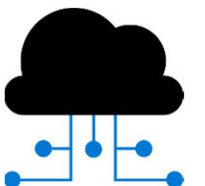
Connect Services with Virtual Network Peering (2 of 2)

Types of peering connections:

- Virtual network peering
- Global virtual network peering

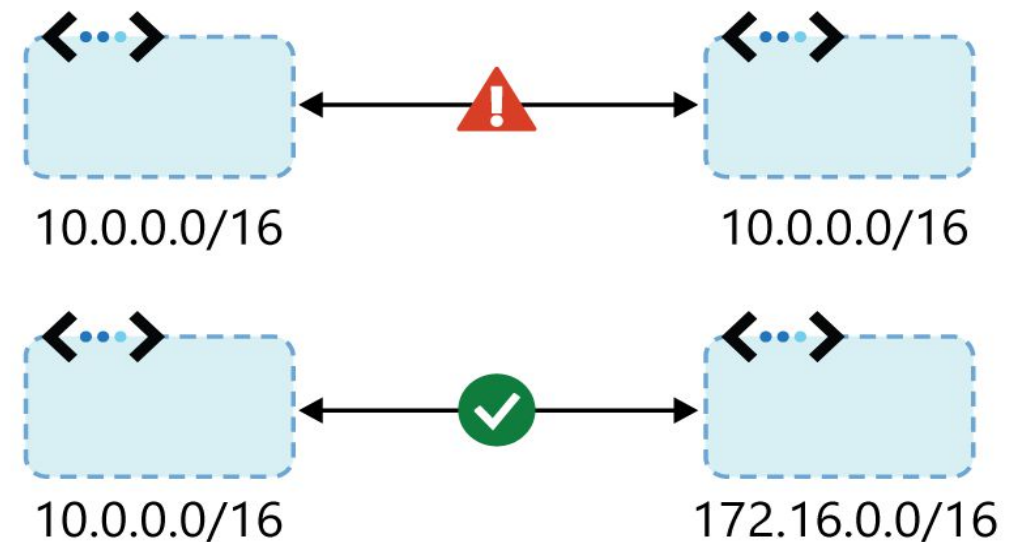
Peering considerations:

- Reciprocal connections are required
- Cross-subscription peerings are supported



Transitivity and Gateway Transit

- Virtual network peering is nontransitive
- Gateway transit:
 - Facilitates cross-premises connectivity
 - Enable the **Allow gateway transit** option in the hub
 - Enable the **Use remote gateways** option on spoke
- Peering considerations:
 - IP address spaces can't overlap
 - Peering is the recommended option



Choose Between Virtual Network Peering and VPN Gateways

Virtual Network peering:

- Direct (no interconnecting devices)
- Low-latency, high-bandwidth
- Regional or global

VPN gateways:

- Serve as interconnecting devices
- Introduce extra latency and limit bandwidth

Gateway transit:

- Allows sharing a VPN or ExpressRoute gateway across a peering
- Minimizes complexity and centralizes management



Implement VNet Peering



Configure VNet Peering

Configure VNet peering:

1. Create two virtual networks
2. Peer the virtual networks
3. Create virtual machines on each network
4. Test communication between the machines

Use the **Add peering** blade to configure peering:

- Allow forwarded traffic
- Allow gateway transit
- Use remote gateways

Configuration

Configure virtual network access settings

Allow virtual network access from vnet1 to vnet2 ⓘ

Disabled **Enabled**

Configure forwarded traffic settings

Allow forwarded traffic from vnet2 to vnet1 ⓘ

Disabled Enabled

Configure gateway transit settings

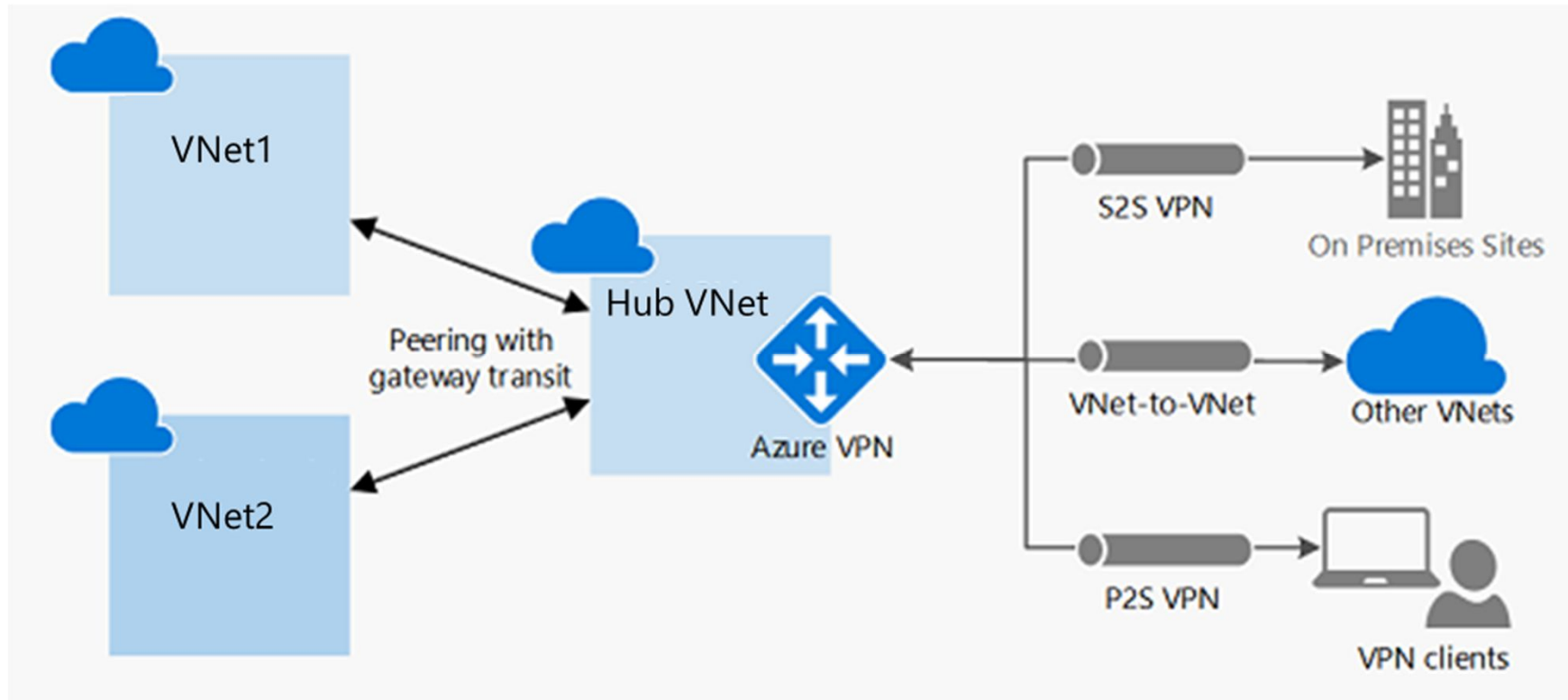
☒ Allow gateway transit ⓘ

Configure Remote Gateways settings

☐ Use remote gateways ⓘ

Service Chaining (1 of 2)

Hub and spoke architecture



Service Chaining (2 of 2)

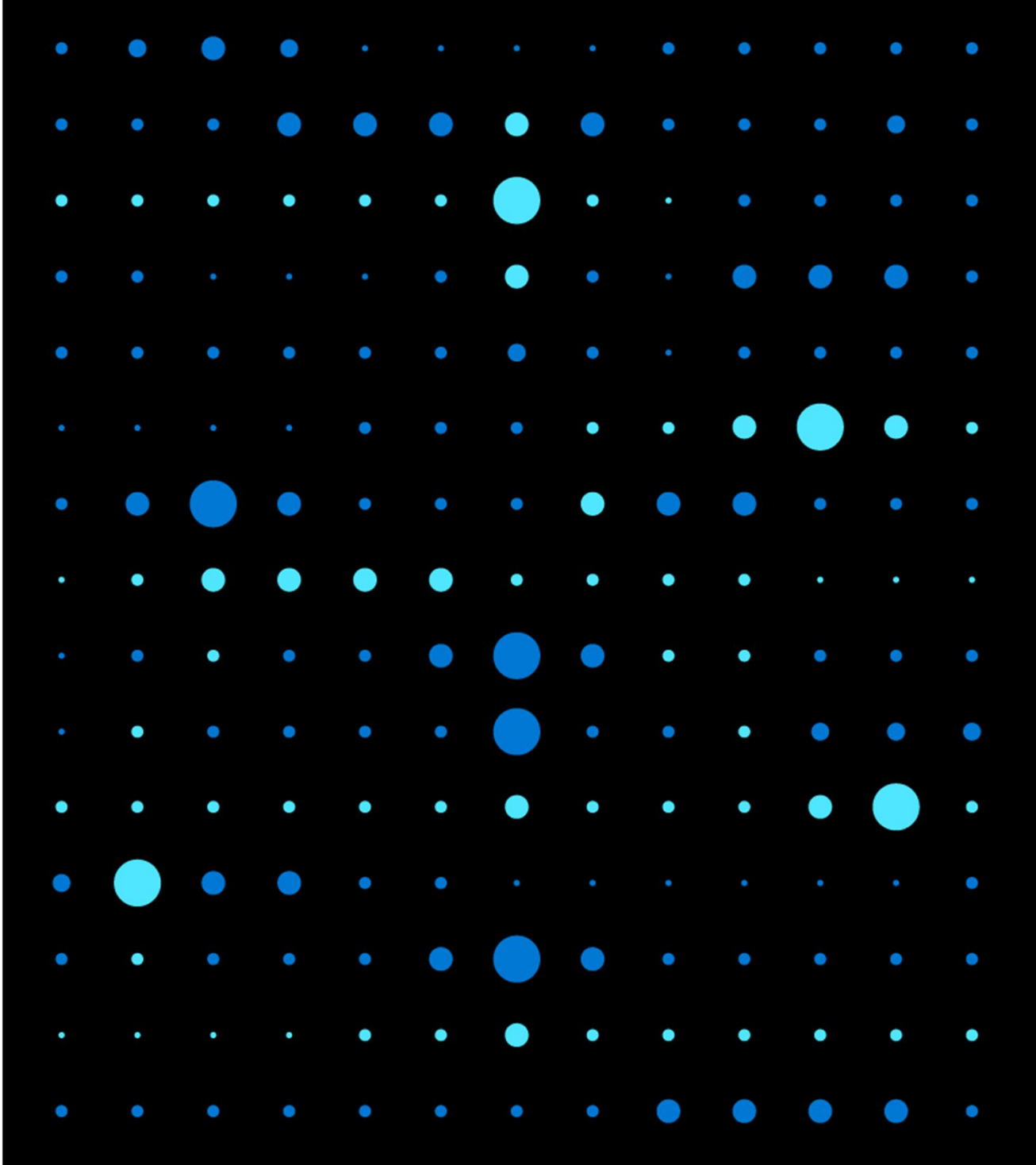
- User defined routes and service chaining
- Checking connectivity status:
 - Updating
 - Connected

SETTINGS	NAME	PEERING STATUS	PEER	GATEWAY TRANSIT
 DNS servers	myVirtualNetwork1-myVirtualNetwork2	Updating	myVirtualNetwork2	Disabled
 Peerings				



Demonstration: VNet Peering

- Configure VNet peering
- Configure a VPN gateway
- Allow gateway transit
- Confirm VNet peering



Modify or Delete VNet Peering

Modify a peering:

1. In the Azure portal, list the existing virtual networks
2. Select the virtual network you want to change
3. Under **Settings**, select **Peerings**
4. Select the peering you want to change
5. Change the appropriate setting
6. Select **Save**

Delete a peering:

1. In the Azure portal, list the existing virtual networks
2. Select the virtual network you want to delete a peering for
3. Under **Settings**, select **Peerings**
4. On the peering blade, select **Delete** and then **Yes**

Requirements and Constraints

- Peering virtual networks in different regions is also referred to as Global VNet Peering.
- You can use remote gateways or allow gateway transit in globally peered virtual networks and locally peered virtual networks.
- You can't add address ranges to, or delete address ranges from, a virtual network's address space once a virtual network is peered with another virtual network.
 - To add or remove address ranges, delete the peering, add or remove the address ranges, then re-create the peering.
- You can peer two virtual networks deployed through Resource Manager or a virtual network deployed through Resource Manager with a virtual network deployed through the classic deployment model.
 - You cannot peer two virtual networks created through the classic deployment model

Module Review Questions



Online Role-based training resources:

Microsoft Learn

<https://docs.microsoft.com/en-us/learn/>

Thank you.