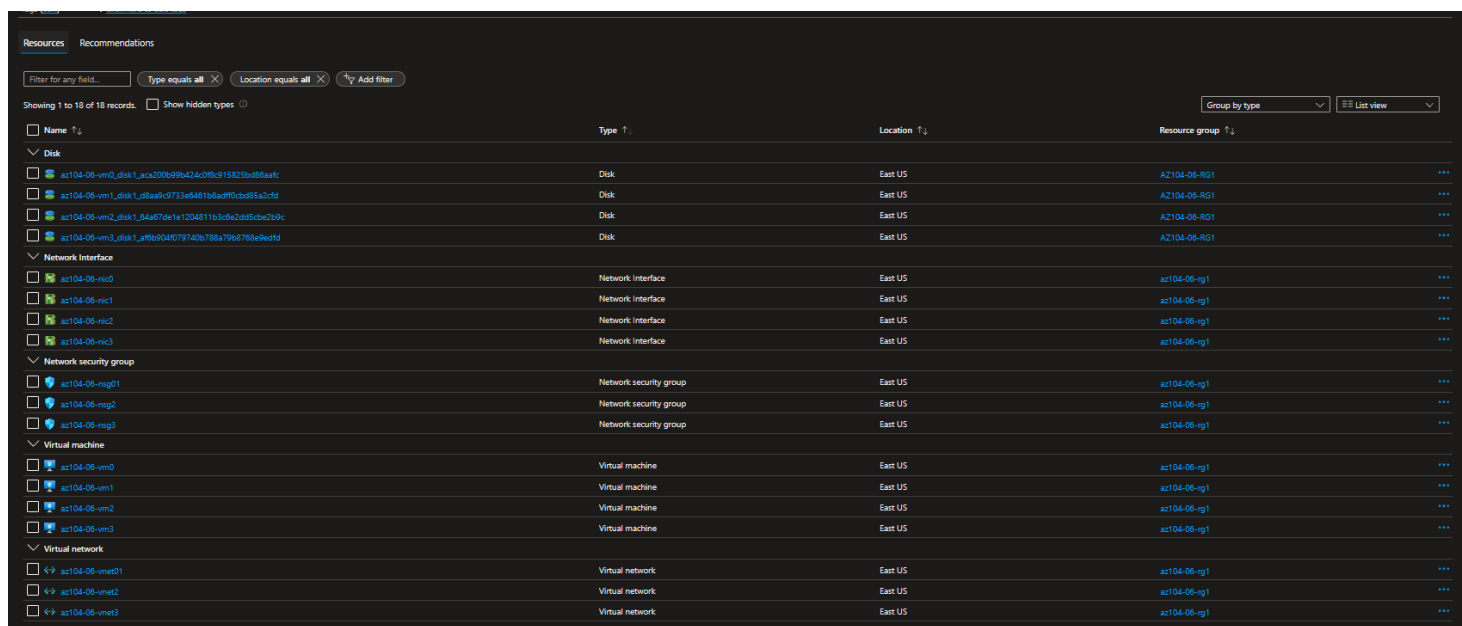


Lab 06 - Implement Traffic Management

You were tasked with testing managing network traffic targeting Azure virtual machines in the hub and spoke network topology, which Contoso considers implementing in its Azure environment (instead of creating the mesh topology, which you tested in the previous lab). This testing needs to include implementing connectivity between spokes by relying on user defined routes that force traffic to flow via the hub, as well as traffic distribution across virtual machines by using layer 4 and layer 7 load balancers. For this purpose, you intend to use Azure Load Balancer (layer 4) and Azure Application Gateway (layer 7).

1. Lab provisioning with ARM templates

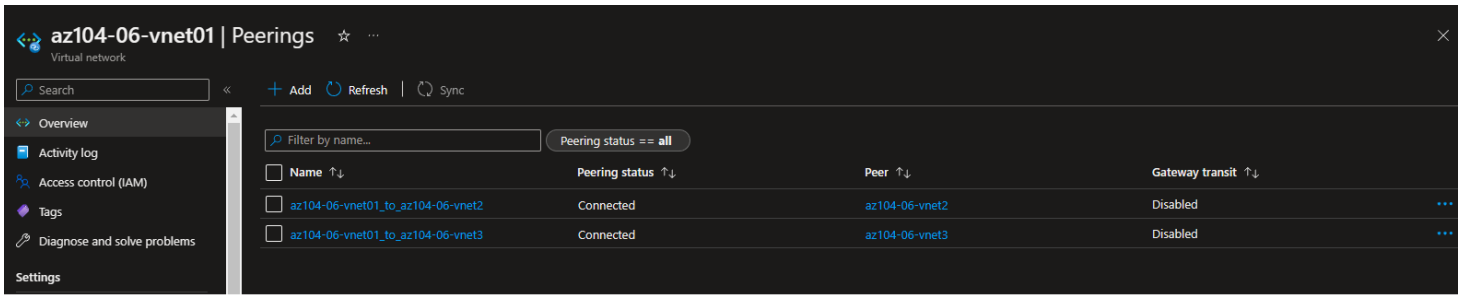


Name	Type	Location	Resource group
Disk			
az104-06-vm0_disk1_4ca200699a424c08c9153250d86a9fc	Disk	East US	AZ104-06-rg1
az104-06-vm1_disk1_d8aa9d773a6461b6aaf90c0d85a2cfd	Disk	East US	AZ104-06-rg1
az104-06-vm2_disk1_64a67de1e1204811b3cfe2d5c9e29dc	Disk	East US	AZ104-06-rg1
az104-06-vm3_disk1_9f6b904079740b78ba79b876b9d9dcd	Disk	East US	AZ104-06-rg1
Network Interface			
az104-06-nic0	Network Interface	East US	az104-06-rg1
az104-06-nic1	Network Interface	East US	az104-06-rg1
az104-06-nic2	Network Interface	East US	az104-06-rg1
az104-06-nic3	Network Interface	East US	az104-06-rg1
Network security group			
az104-06-nsg01	Network security group	East US	az104-06-rg1
az104-06-nsg2	Network security group	East US	az104-06-rg1
az104-06-nsg3	Network security group	East US	az104-06-rg1
Virtual machine			
az104-06-vm0	Virtual machine	East US	az104-06-rg1
az104-06-vm1	Virtual machine	East US	az104-06-rg1
az104-06-vm2	Virtual machine	East US	az104-06-rg1
az104-06-vm3	Virtual machine	East US	az104-06-rg1
Virtual network			
az104-06-vnet01	Virtual network	East US	az104-06-rg1
az104-06-vnet2	Virtual network	East US	az104-06-rg1
az104-06-vnet3	Virtual network	East US	az104-06-rg1

ToDo:

- Read on cli provisions
- Check ARM templates

2. Configured network



ToDo:

- What a is hub/spoke topolgy
- Peerings

3. Transitivity test

Testing connection between vm0 and vm2

Source

Destination

az104-06-vm0

10.62.0.4



Diagnostic tests

Test	Status	Details	Suggestions
Connectivity Test	<div><div></div><div>Success</div></div>	Probes Sent: 66 .Probes Failed: 0 Avg Latency: 1 ms Min Latency: 1 ms Min Latency: 2 ms	None
NSG Outbound (from source)	<div><div></div><div>Success</div></div>	Outbound communication from source is allowed	None
Next Hop (from source)	<div><div></div><div>Success</div></div>	Next Hop Type: VirtualNetworkPeering Route Table Id: System Route	None

Hop by hop details

Name	Status	IP address	Next hop	RTT	Errors
<div><div></div><div>az104-06-vm0</div></div>	<div><div></div><div>Success</div></div>	10.60.0.4	10.62.0.4	2	-
<div><div></div><div>az104-06-nic2</div></div>	<div><div></div><div>Success</div></div>	10.62.0.4	-	-	-

Testing connection between vm0 and vm3

Test	Status	Details	Suggestions		
Connectivity Test	✔ Success	Probes Sent: 66 .Probes Failed: 0 Avg Latency: 1 ms Min Latency: 1 ms Min Latency: 4 ms	None		
NSG Outbound (from source)	✔ Success	Outbound communication from source is allowed	None		
Next Hop (from source)	✔ Success	Next Hop Type: VirtualNetworkPeering Route Table Id: System Route	None		
Hop by hop details					
Name	Status	IP address	Next hop	RTT	Errors
 az104-06-vm0	✔ Success	10.60.0.4	10.63.0.4	1	-
 az104-06-nic3	✔ Success	10.63.0.4	-	-	-

ToDo:

- What is transivity -> Node interconnectivity
- research network watcher functionality

4. Configure routing in the hub and spoke topology

- Enabling IP forwarding on vm0's nic0 and runing powershell

```
Install-WindowsFeature RemoteAccess -IncludeManagementTools
```



```
Install-WindowsFeature -Name Routing -IncludeManagementTools -IncludeAllSubFeature
```

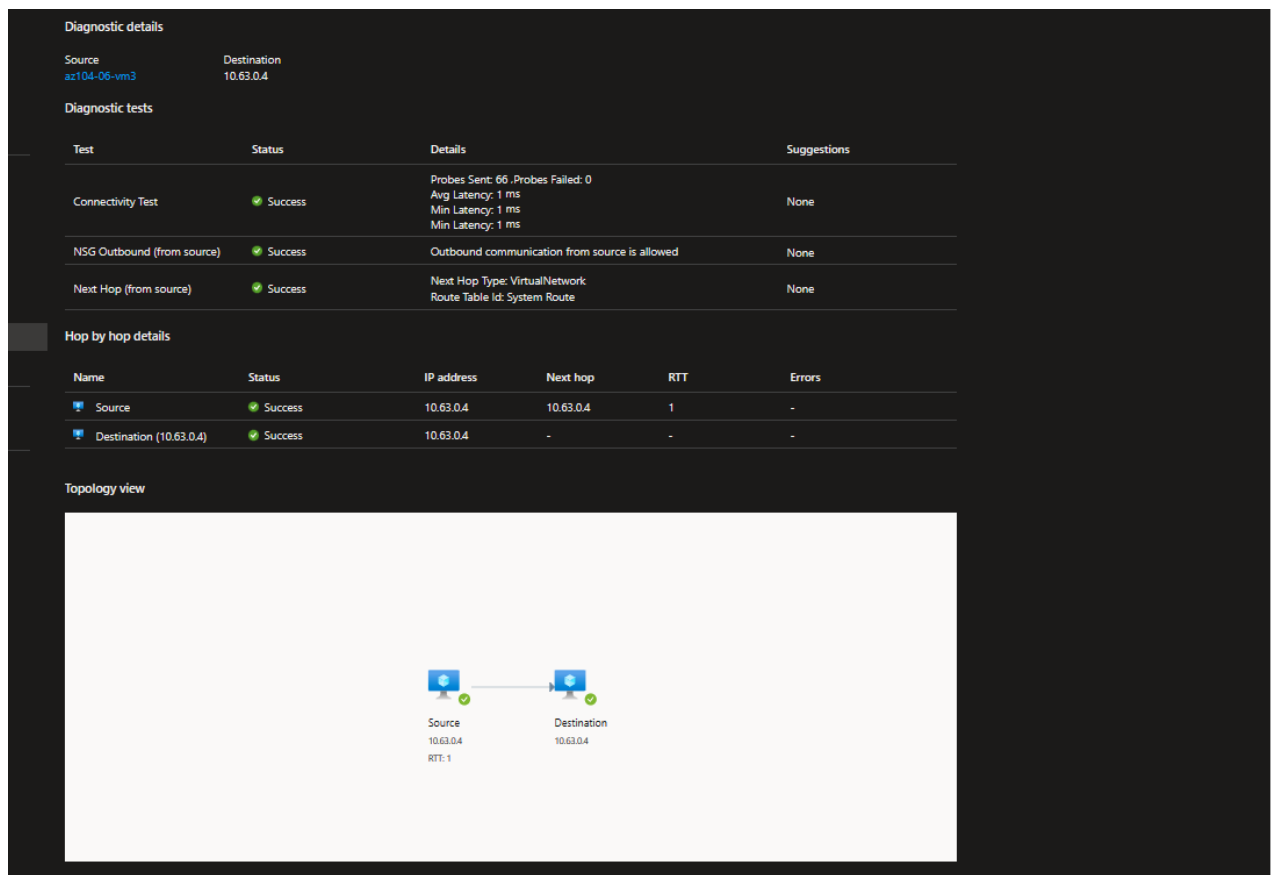
```
Install-WindowsFeature -Name "RSAT-RemoteAccess-Powershell"
```

```
Install-RemoteAccess -VpnType RoutingOnly
```

```
Get-NetAdapter | Set-NetIPInterface -Forwarding Enabled
```

We now have the hub, time to make the spokes

Route tables		
Default Directory (darkmoonbgaz1outlook.onmicrosoft.com)		
+ Create Manage view Refresh Export to CSV Open query Assign tags		
Filter for any field... Subscription equals all Resource group equals all Location equals all Add filter		
Showing 1 to 2 of 2 records.		
<input type="checkbox"/> Name ↑↓	Resource group ↑↓	Location ↑↓
<input type="checkbox"/>  az104-06-r23	az104-06-rg1	East US
<input type="checkbox"/>  az104-06-r32	az104-06-rg1	East US



ToDo: Get a new screenshot with a test, this one is wrong

5. Load balancer

ToDo:

- missing screenshots for some reason
- research load balancer settings

6. Application gateway spoke

Load testing the gateway with LOIC (+2k requests)

- Check the new topology tool
- Add text