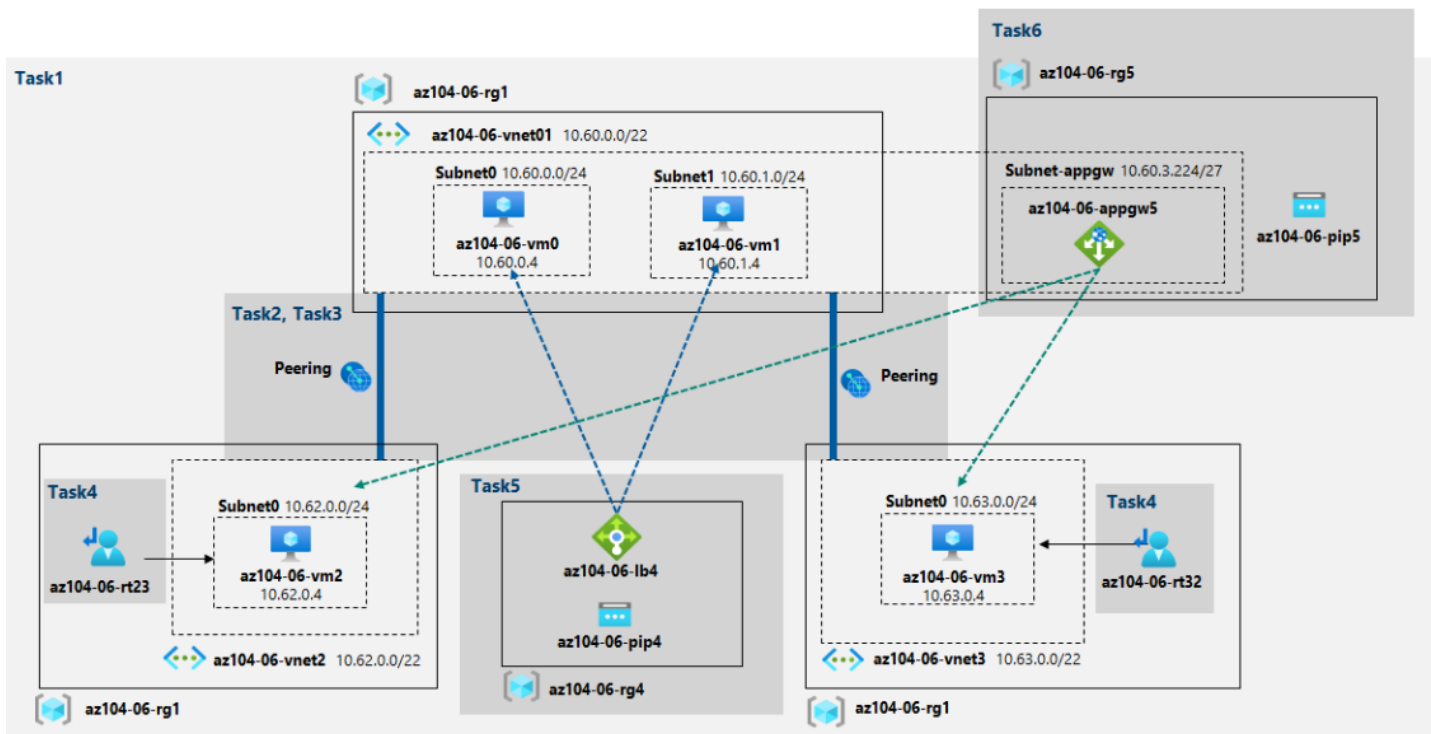


Implement Traffic Management

Topology 1.0:



Solution of Implement Traffic Management step by step:

1. Provision the environment
2. Configure hub and spoke network topology
3. Test transitivity of virtual networking peering
4. Configure routing in the hub and spoke topology
5. Implement Azure Load Balancer
6. Implement Azure Application Gateway

Step 1:

Created 4 virtual machines from azure portal according to the Topology 1.0 ;

- ❖ be careful **vnets** and **subnets** configurations
- ❖ there is no public ip on the vm's
- ❖ don't forget to save-download your json files
- ❖ all vm's will be in the same rg
- ❖ NEXT 6 pictures (1A...1F) show VMs, VNets and RG configuration.
- ❖ On the file storage part on GitHub, you can see-download ARM templates as a separate file.

1A.

Virtual machines

deop.ca (deop.ca)

+ Create Switch to classic Reservations Manage view Refresh Export to CSV Open query Assign tags Start Restart Stop Delete Services

Filter for any field...

Subscription equals all Type equals all Resource group equals all X Location equals all X Add filter

No grouping List view

<input type="checkbox"/> Name ↑↓	Type ↑↓	Subscription ↑↓	Resource group ↑↓	Location ↑↓	Status ↑↓	Operating system ↑↓	Size ↑↓	Public IP add
<input type="checkbox"/> az104-06-vm0	Virtual machine	Azure subscription 1	AZ104-06-RG1	East US	Running	Linux	Standard_B1s	20.121.254.42
<input type="checkbox"/> az104-06-vm1	Virtual machine	Azure subscription 1	AZ104-06-RG1	East US	Running	Linux	Standard_B1s	20.121.254.42
<input type="checkbox"/> az104-06-vm2	Virtual machine	Azure subscription 1	az104-06-rg1	East US	Running	Linux	Standard_B1s	-
<input type="checkbox"/> az104-06-vm3	Virtual machine	Azure subscription 1	az104-06-rg1	East US	Running	Linux	Standard_B1s	-

1B.

Virtual networks

deop.ca (deop.ca)

+ Create Manage view Refresh Export to CSV Open query Assign tags

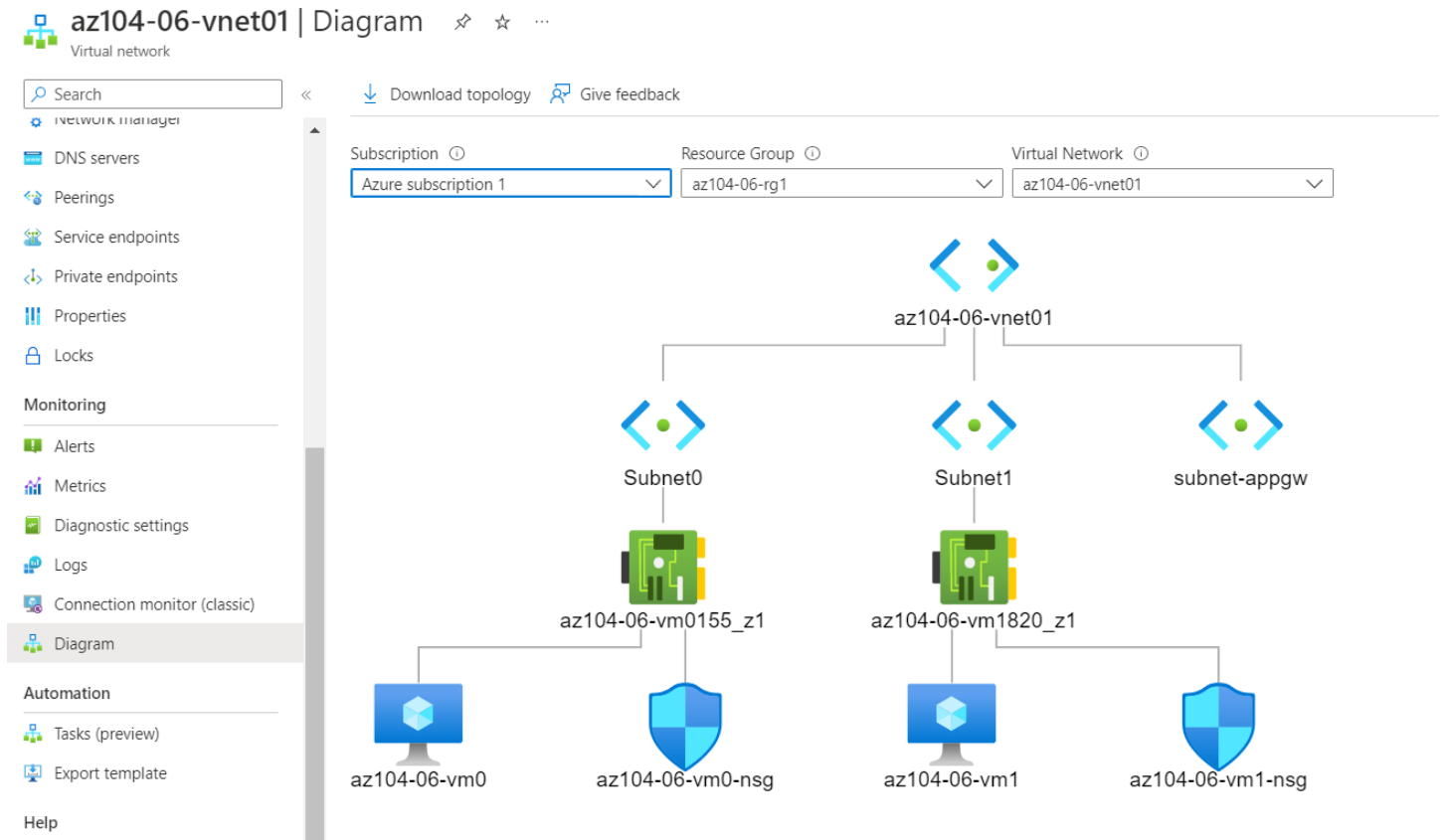
Filter for any field...

Subscription equals all Resource group equals all X Location equals all X Add filter

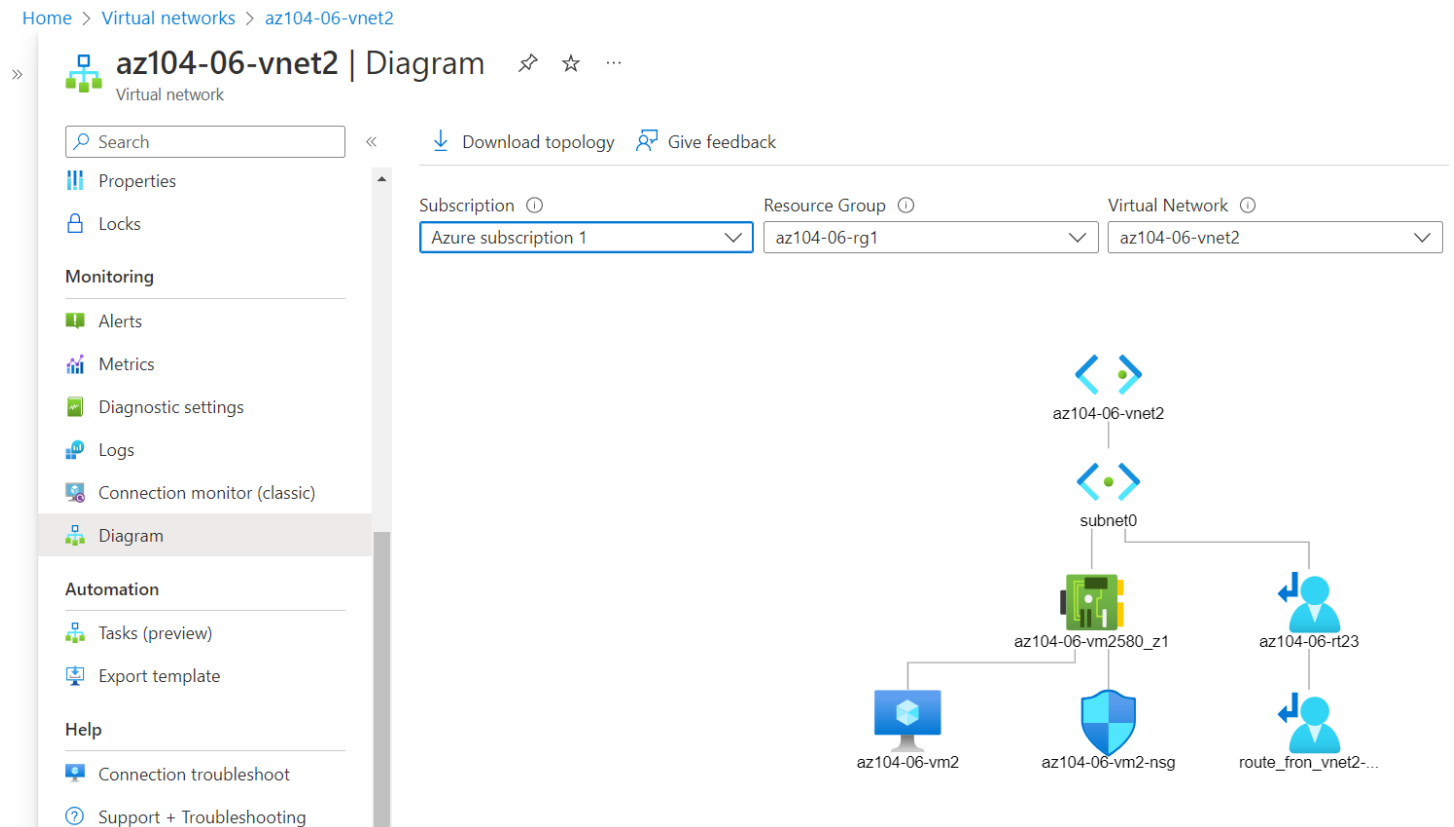
No grouping List view

<input checked="" type="checkbox"/> Name ↑↓	Resource group ↑↓	Location ↑↓	Subscription ↑↓
<input checked="" type="checkbox"/> az104-06-vnet01	az104-06-rg1	East US	Azure subscription 1
<input checked="" type="checkbox"/> az104-06-vnet2	az104-06-rg1	East US	Azure subscription 1
<input checked="" type="checkbox"/> az104-06-vnet3	az104-06-rg1	East US	Azure subscription 1

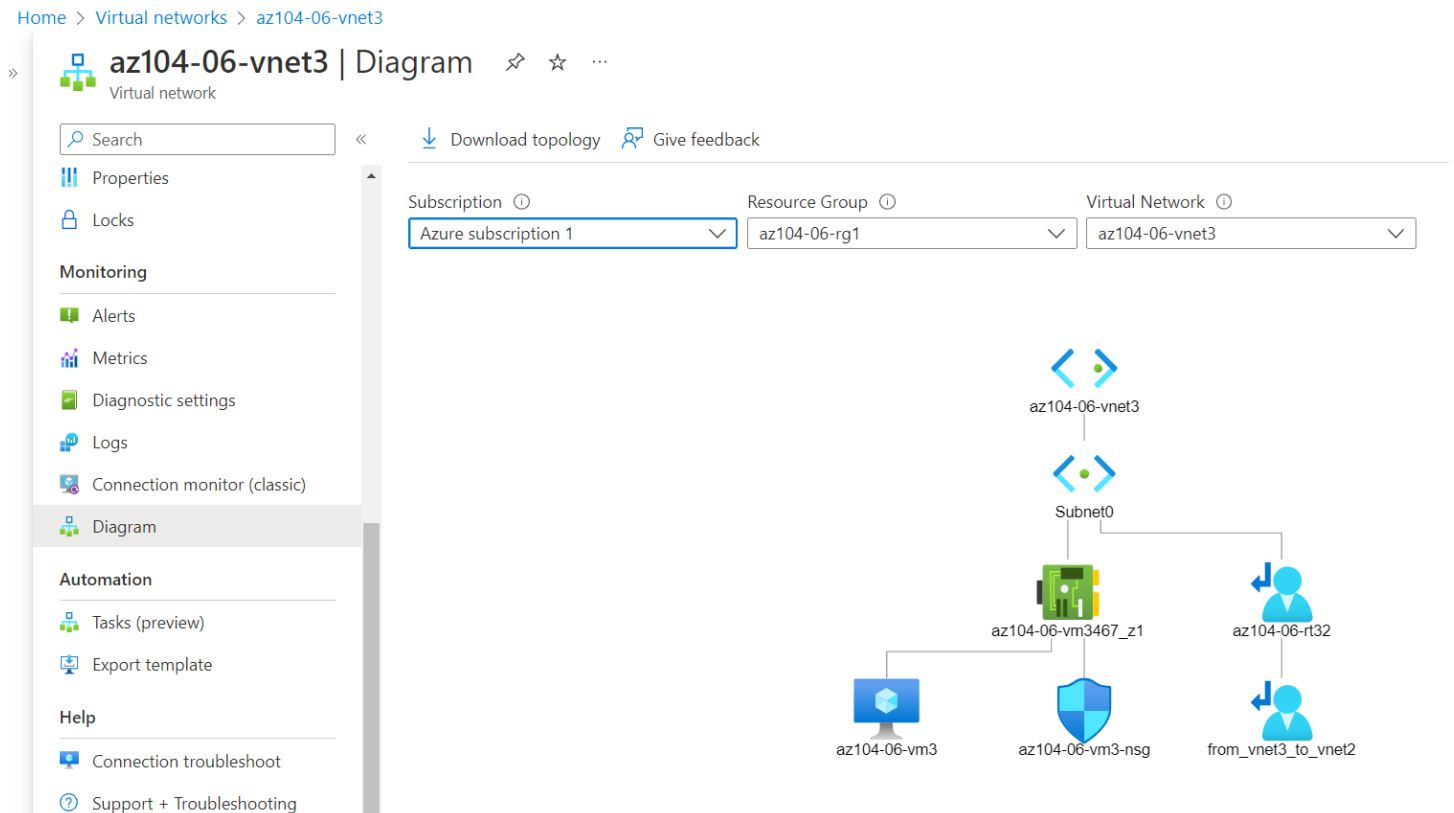
1C.



1D.

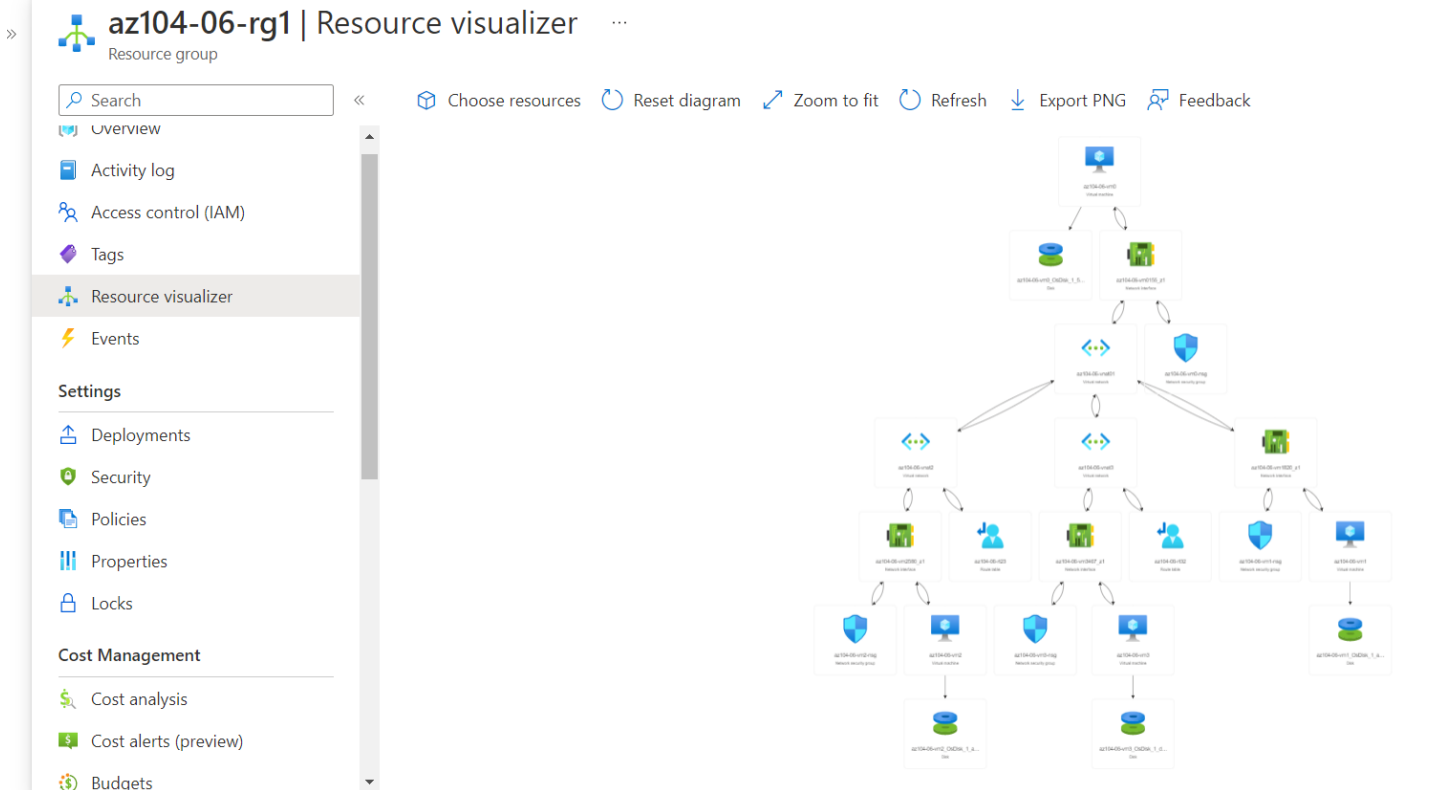


1E.



1F.

[Home](#) > [Resource groups](#) > [az104-06-rg1](#)



Step 2-3:

Created 2 VNET peering between vnet01-vnet2 and vnet01-vnet3 like on the Topology 1.0 ;

- ❖ After setting up 2 peering check the connectivity between them.
- ❖ To check the connectivity is used **Network Watcher** (after altering the NW on the left pane use connection troubleshooting)
- ❖ Next 2 pictures (2A-2B) demonstrated the connectivity, all details on it

2A.

Network Watcher | Connection troubleshoot

Microsoft

Search

Advanced settings

Network Performance Monitor

Network diagnostic tools

- IP flow verify
- NSG diagnostics
- Next hop
- Effective security rules
- VPN troubleshoot
- Packet capture
- Connection troubleshoot

Metrics

- Usage + quotas

Logs

- NSG flow logs

Check

Status

✓ Reachable

Agent extension version

1.4

Source virtual machine

az104-06-vm0

Grid view Topology view

Hops

Name	IP address	Status	Next hop IP address	RTT
az104-06-vm0	10.60.0.4	✓	10.62.0.4	1
az104-06-vm25...	10.62.0.4	✓	-	-

2B.

Network Watcher | Connection troubleshoot

Microsoft

Search

Monitoring

- Topology
- Connection monitor (classic)
- Connection monitor
- Network Performance Monitor

Network diagnostic tools

- IP flow verify
- NSG diagnostics
- Next hop
- Effective security rules
- VPN troubleshoot
- Packet capture
- Connection troubleshoot

Metrics

- Usage + quotas

Logs

- NSG flow logs
- Dagnostic logs

URI, FQDN or IP address *

10.63.0.4 ✓

Probe Settings

Protocol TCP ICMP

Destination port * 22 ✓

Advanced settings

Check

Status

✓ Reachable

Agent extension version

1.4

Source virtual machine

az104-06-vm0

Grid view Topology view

Hops

Name	IP address	Status	Next hop IP address	RTT
az104-06-vm0	10.60.0.4	✓	10.63.0.4	2
az104-06-vm34...	10.63.0.4	✓	-	-

Step 4:

Created 2 route table which are route_from_vnet2-to-vnet3 and from_vnet3_to_vnet2.

Topology 1.0 ;

❖ Configuration, Next hop type and Next hop IP address is shown on the pictures (3A-3B)

3.A

The screenshot shows the Azure portal interface for a route table named 'az104-06-rt23'. The left sidebar contains navigation options: Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Settings (Configuration, Routes, Subnets, Properties, Locks), Monitoring (Alerts), and Automation. The main content area is titled 'Route table' and includes a search bar and action buttons (Move, Delete, Refresh, Give feedback). Under the 'Essentials' section, the following details are listed:

- Resource group (move): [az104-06-rg1](#)
- Location: East US
- Subscription (move): [Azure subscription 1](#)
- Subscription ID: 658b7aa8-6d79-4894-a694-a6e0220fcdce
- Tags (edit): [Click here to add tags](#)

Associations: 1 subnet associations

The 'Routes' section shows a table with the following data:

Name	Address prefix	Next hop type	Next hop IP address
route_from_vnet2-to-vnet3	10.63.0.0/22	Virtual appliance	10.60.0.4

The 'Subnets' section shows a table with the following data:

Name	Address range	Virtual network	Security group
subnet0	10.62.0.0/24	az104-06-vnet2	-

3.B

The screenshot shows the Azure portal interface for a route table named 'az104-06-rt32'. The left sidebar contains navigation options: Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Settings (Configuration, Routes, Subnets, Properties, Locks), Monitoring (Alerts), and Automation. The main content area is titled 'Route table' and includes a search bar and action buttons (Move, Delete, Refresh, Give feedback). Under the 'Essentials' section, the following details are listed:

- Resource group (move): [az104-06-rg1](#)
- Location: East US
- Subscription (move): [Azure subscription 1](#)
- Subscription ID: 658b7aa8-6d79-4894-a694-a6e0220fcdce
- Tags (edit): [Click here to add tags](#)

Associations: 1 subnet associations

The 'Routes' section shows a table with the following data:

Name	Address prefix	Next hop type	Next hop IP address
from_vnet3_to_vnet2	10.62.0.0/22	Virtual appliance	10.60.0.4

The 'Subnets' section shows a table with the following data:

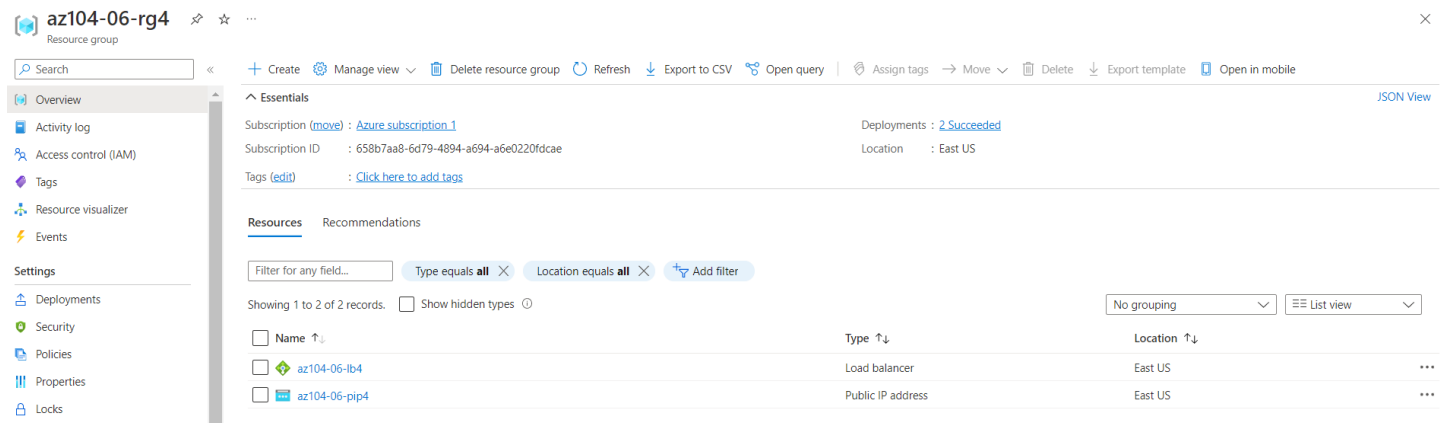
Name	Address range	Virtual network	Security group
Subnet0	10.63.0.0/24	az104-06-vnet3	-

Step 5:

Implemented Azure Load Balancer on vm0 and vm1 and named az104-06-lb4 like on the Topology 1.0 ;

- ❖ Implementation take placed on the resource group 4 (rg4)
- ❖ Public ip assigned to the Load balancer which is called **az104-06-pip4**
- ❖ Configuration is shown on the picture(4A...4D)
- ❖ There is no NAT rules

4A.



az104-06-rg4

Search

Overview

Activity log

Access control (IAM)

Tags

Resource visualizer

Events

Settings

Deployments

Security

Policies

Properties

Locks

Essentials

Subscription (move): Azure subscription 1

Subscription ID: 658b7aa8-6d79-4894-a694-a6e0220fdcae

Tags (edit): Click here to add tags

Deployments: 2 Succeeded

Location: East US

Resources

Recommendations

Filter for any field...

Type equals all

Location equals all

Add filter

Showing 1 to 2 of 2 records.

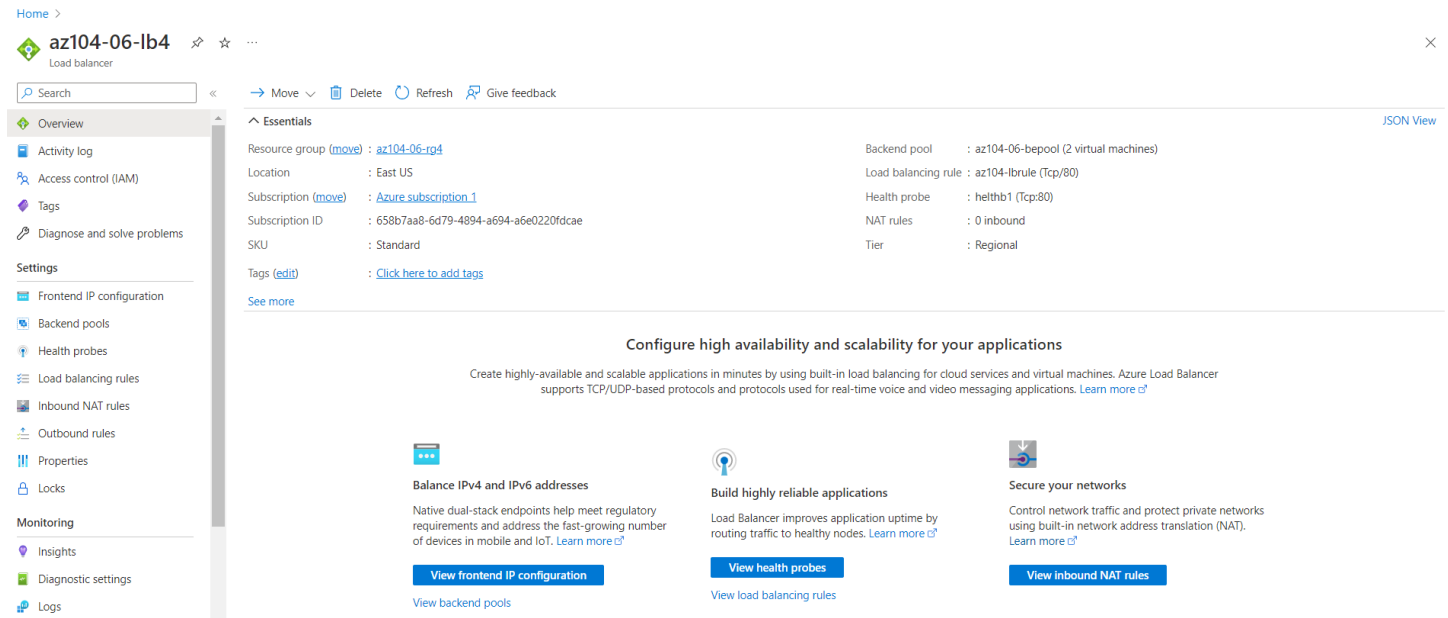
Show hidden types

No grouping

List view

Name	Type	Location
az104-06-lb4	Load balancer	East US
az104-06-pip4	Public IP address	East US

4B.



Home >

az104-06-lb4

Load balancer

Search

Move

Delete

Refresh

Give feedback

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Frontend IP configuration

Backend pools

Health probes

Load balancing rules

Inbound NAT rules

Outbound rules

Properties

Locks

Monitoring

Insights

Diagnostic settings

Logs

Essentials

Resource group (move): az104-06-rg4

Location: East US

Subscription (move): Azure subscription 1

Subscription ID: 658b7aa8-6d79-4894-a694-a6e0220fdcae

SKU: Standard

Tags (edit): Click here to add tags

See more

Backend pool: az104-06-bepool (2 virtual machines)

Load balancing rule: az104-lbrule (Tcp/80)

Health probe: helthb1 (Tcp/80)

NAT rules: 0 inbound

Tier: Regional

Configure high availability and scalability for your applications

Create highly-available and scalable applications in minutes by using built-in load balancing for cloud services and virtual machines. Azure Load Balancer supports TCP/UDP-based protocols and protocols used for real-time voice and video messaging applications. [Learn more](#)

Balance IPv4 and IPv6 addresses

Native dual-stack endpoints help meet regulatory requirements and address the fast-growing number of devices in mobile and IoT. [Learn more](#)

View frontend IP configuration

View backend pools

Build highly reliable applications

Load Balancer improves application uptime by routing traffic to healthy nodes. [Learn more](#)

View health probes

View load balancing rules

Secure your networks

Control network traffic and protect private networks using built-in network address translation (NAT). [Learn more](#)

View inbound NAT rules

4C.



Home > az104-06-lb4

az104-06-lb4 | Frontend IP configuration

Load balancer

Search

Add

Refresh

Give feedback

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Filter by name...

Name	IP address	Rules count
az104-06-pip4	20.121.254.42 (az104-06-pip4)	1

4D.

Home > az104-06-lb4

az104-06-lb4 | Health probes

Load balancer

Search Filter by name...

+ Add Refresh Give feedback

Name ↑↓	Protocol ↑↓	Port ↑↓	Used By ↑↓
helthb1	TCP	80	az104-lbrule

Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems

Step 6:

Implemented Azure Application Gateway on vm0 and vm1 and named az104-06-lb4 like on the Topology 1.0 ;

- ❖ Implementation take placed on the resource group 5 (rg5)
- ❖ Public ip assigned to the Load balancer which is called **az104-06-pip5**
- ❖ Configuration is shown on the picture(5A...5D)
- ❖ There is no NAT rules

5A.

Home > Resource groups > az104-06-rg5

Resource groups

deop.ca (deop.ca)

+ Create Manage view

Filter for any field...

Name ↑↓
az104-06-rg1
az104-06-rg4
az104-06-rg5
cloud-shell-storage-eastus
NetworkWatcherRG
vnet-test

Page 1 of 1

az104-06-rg5 | Resource visualizer

Resource group

Search Choose resources Reset diagram Zoom to fit Refresh Export PNG Feedback

Overview
Activity log
Access control (IAM)
Tags
Resource visualizer
Events
Settings
Deployments
Security
Policies
Properties
Locks
Cost Management
Cost analysis
Cost alerts (preview)

az104-06-appgw5
Application gateway

az104-06-pip5

5B.

Home > Load balancing

Load balancing | Application Gateway

Search

+ Create Manage view Refresh Export to CSV Open query Assign tags

Overview

Filter for any field... Subscription equals all Resource group equals all Location equals all Add filter

No grouping List view

Name	Public IP	Private IP	Resource group	Location	Subscription
az104-06-appgw5	20.232.125.76	-	az104-06-rg5	East US	Azure subscription 1

5C.

az104-06-appgw5 | Frontend IP configurations

Application gateway

Search

Search frontend IP configurations

Type	Status	Name	IP address	Associated listeners
Public	Configured	appGwPublicFrontendIp	20.232.125.76 (az104-06-...	rule1_listener
Private	Not configured	-	-	-

5D.

Home > Resource groups

az104-06-rg5

Resource group

Search

+ Create Manage view Delete resource group Refresh Export to CSV Open query Assign tags Move Delete

Overview

Activity log

Access control (IAM)

Tags

Resource visualizer

Events

Settings

Deployments

Security

Policies

Properties

Locks

Essentials

Subscription (move): Azure subscription 1

Subscription ID: 658b7aa8-6d79-4894-a694-a6e0220fdcae

Deployments: 1 Failed

Location: East US

Tags (edit): Click here to add tags

Resources Recommendations

Filter for any field... Type equals all Location equals all Add filter

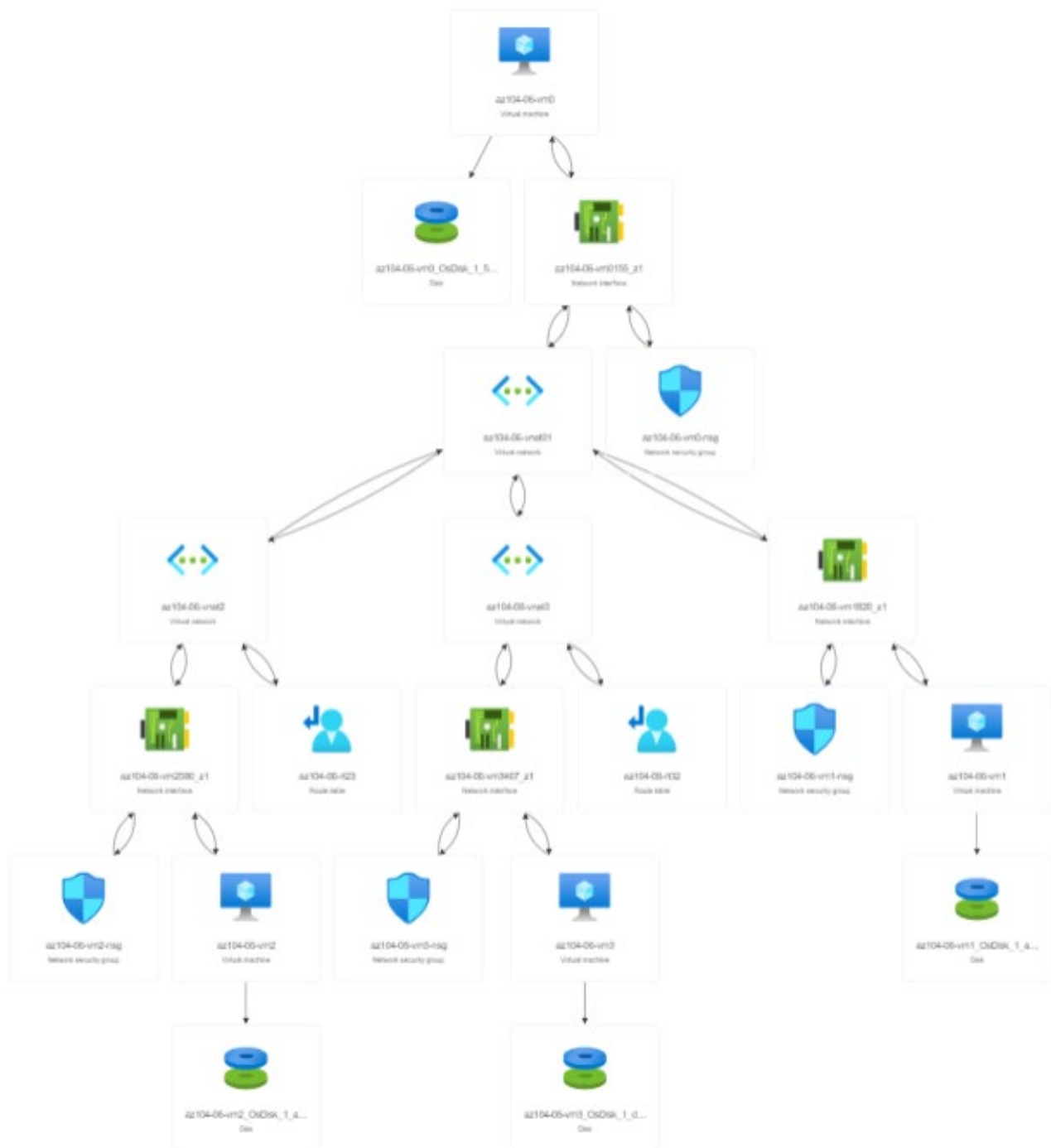
Showing 1 to 2 of 2 records. Show hidden types

No grouping List view

Name	Type	Location
az104-06-appgw5	Application gateway	East US
az104-06-pip5	Public IP address	East US

Final:

All configuration in a map.



THANK YOU FOR YOUR TIME