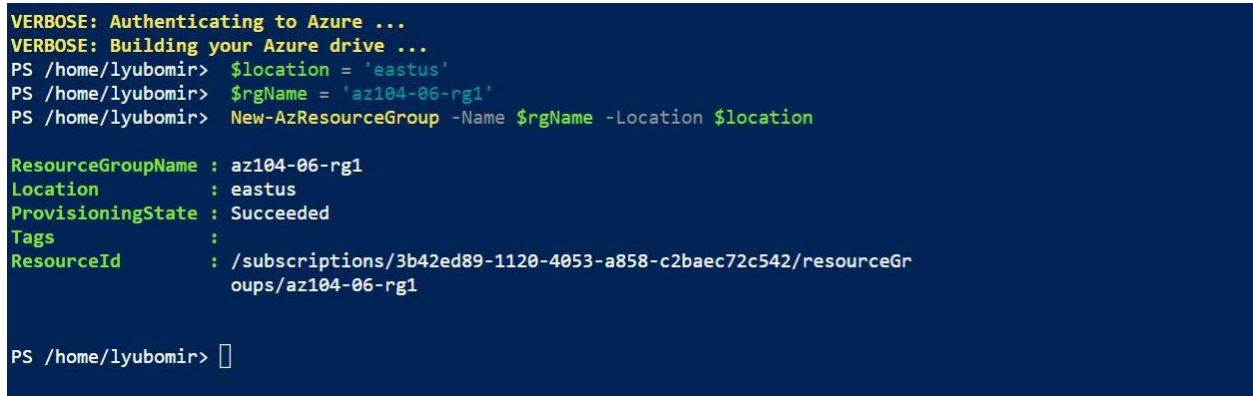
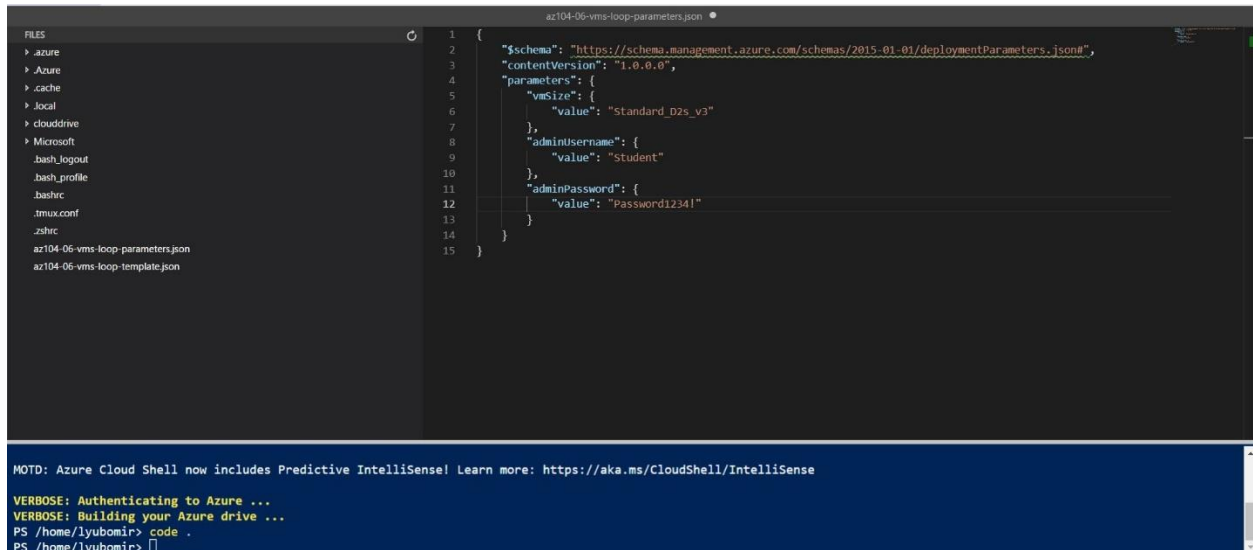
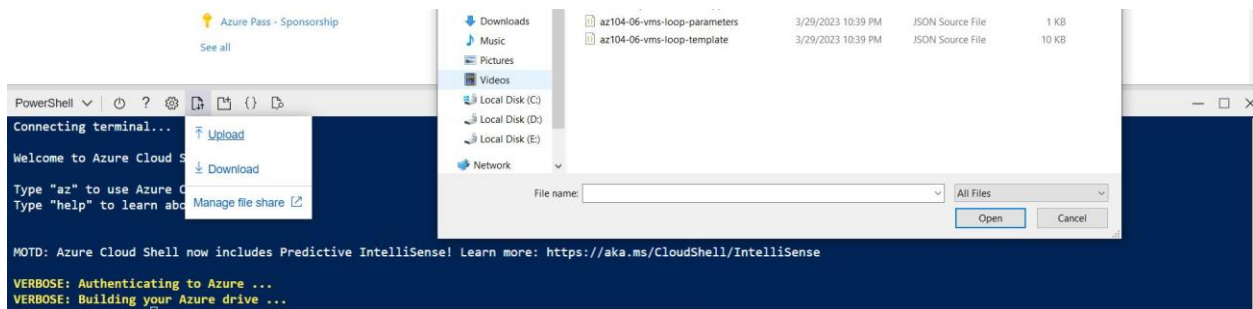


Lab 06 - Implement Traffic Management

Task 1: Provision the lab environment



```

PS /home/lyubomir> New-AzResourceGroupDeployment `
-TemplateFile $HOME/az104-06-vms-loop-template.json `
>> -ResourceGroupName $rgName `
>> -TemplateParameterFile $HOME/az104-06-vms-loop-parameters.json

DeploymentName      : az104-06-vms-loop-template
ResourceGroupName   : az104-06-rg1
ProvisioningState    : Succeeded
Timestamp           : 3/29/2023 8:13:28 PM
Mode                : Incremental
TemplateLink         :
Parameters          :
                      Name      Type      Value
                      =====
vmSize              : Standard_D2s_v3
vmName              : az104-06-vm
vmCount             : 4
adminUsername       : Student
adminPassword       : null

Outputs
DeploymentDebugLogLevel :

PS /home/lyubomir>
PS /home/lyubomir>

PS /home/lyubomir>
PS /home/lyubomir> $rgName = 'az104-06-rg1'
PS /home/lyubomir> $location = (Get-AzResourceGroup -ResourceGroupName $rgName).location
PS /home/lyubomir> $vmNames = (Get-AzVM -ResourceGroupName $rgName).Name
PS /home/lyubomir>
PS /home/lyubomir> foreach ($vmName in $vmNames) {
>> Set-AzVMExtension
>> -ResourceGroupName $rgName
>> -Location $location
>> -VMName $vmName
>> -Name 'networkwatcheragent'
>> -Publisher 'Microsoft.Azure.NetworkWatcher'
>> -Type 'NetworkWatcherAgentWindows'
>> -TypeHandlerVersion '1.4'
>> }

RequestId IsSuccessStatusCode StatusCode ReasonPhrase
-----
True      OK OK
True      OK OK
True      OK OK
True      OK OK

PS /home/lyubomir>

```

Task 2: Configure the hub and spoke network topology

Microsoft Azure

Home > Virtual networks > az104-06-vnet01

Virtual networks

Default Directory

+ Create Manage view

Filter for any field...

Name ↑

- az104-06-vnet01
- az104-06-vnet2
- az104-06-vnet3

az104-06-vnet01 | Peerings

Virtual network

+ Add Refresh Sync

Filter by name... Peering status == all

Name ↑	Peering status ↑	Peer ↑	Gateway transit ↑
az104-06-vnet01_to_az104-06-vn...	Connected	az104-06-vnet2	Disabled
az104-06-vnet01_to_az104-06-vn...	Updating	az104-06-vnet3	Disabled

Navigation menu:

- Bastion
- DDoS protection
- Firewall
- Microsoft Defender for Cloud
- Network manager
- DNS servers
- Peerings
- Service endpoints
- Private endpoints
- Properties
- Locks

Task 3: Test transitivity of virtual network peering

Search

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

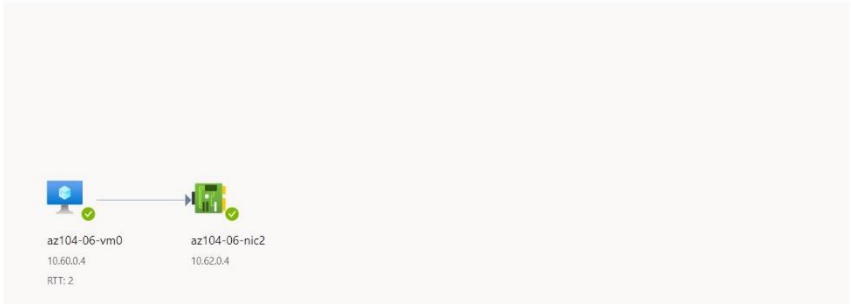
Logs

Flow logs

Hop by hop details

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

Topology view



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

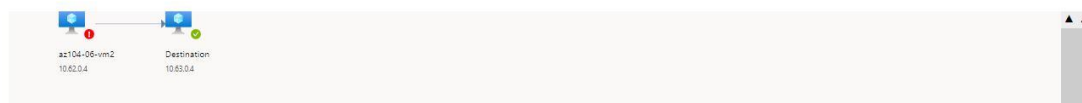


Test	Status	Details	Suggestions
Connectivity Test	❌ Fail	Probes Sent: 0 ,Probes Failed: 0	-
NSG Outbound (from source)	❌ Fail	There are failed tests in the following NSGs: <ul style="list-style-type: none"> • az104-06-nsg2 	Go to VM > Update the networking rule Read docs
Next Hop (from source)	✅ Success	Next Hop Type: None Route Table Id: System Route	None

Hop by hop details

Name	Status	IP address	Next hop	RTT	Errors
az104-06-vm2	❌ Fail	10.62.0.4	10.63.0.4	-	Routes for the destination are missing in the virtual network gateway.
Destination (10.63.0.4)	ℹ Info	10.63.0.4	-	-	

Topology view



Task 4: Configure routing in the hub and spoke topology

az104-06-vm0 | Run command

Search

Change tracking

Automanage

Configuration management (Preview)

Policies

Run command

Monitoring

Insights

Alerts

Metrics

Diagnostic settings

Logs

Connection monitor (classic)

Workbooks

Automation

Tasks (preview)

Export template

Help

Run Command

Run Command recovery, and

Name

RunPowerShellScript

DisableNLA

DisableWind

EnableAdmin

EnableEMS

EnableRemo

EnableWind

IPConfig

RDPSettings

ResetRDPCe

SetRDPPort

Run PowerShellScript

Script execution complete

PowerShell Script

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

Run

Output

```

Success Restart Needed Exit Code Feature Result
-----
True No Success {Remote Access}

```

Home > Virtual machines > az104-06-vm0

Virtual machines

Default Directory

+ Create ▾ Switch to classic ...

Filter for any field...

Name ↑

- az104-06-vm0
- az104-06-vm1
- az104-06-vm2
- az104-06-vm3

Virtual machine: az104-06-vm0 | Run command

Search

- Automanage
- Configuration management (Preview)
- Policies
- Run command
- Monitoring
- Insights
- Alerts
- Metrics
- Diagnostic settings
- Logs
- Connection monitor (classic)
- Workbooks
- Automation

Run PowerShell Script

Script execution complete

PowerShell Script

```
1 Install-WindowsFeature -Name Routing -IncludeManagementTools -IncludeAllSubFeature
2
3 Install-WindowsFeature -Name "RSAT-RemoteAccess-Powershell"
4
5 Install-RemoteAccess -VpnType RoutingOnly
6
7 Get-NetAdapter | Set-NetIPInterface -Forwarding Enabled
```

Run

Output

Success	Restart Needed	Exit Code	Feature Result
True	No	Success	{RAS Connection Manager Administration Kit...
True	No	NoChangeNeeded	{}

Search

- 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

- Flow logs

Topology view

Name	Status	IP address	Next hop	RTT	Errors
az104-06-vm2	Success	10.62.0.4	10.60.0.4	-	-
az104-06-nic0	Success	10.60.0.4	10.63.0.4	-	-
az104-06-nic3	Success	10.63.0.4	-	-	-

Topology view

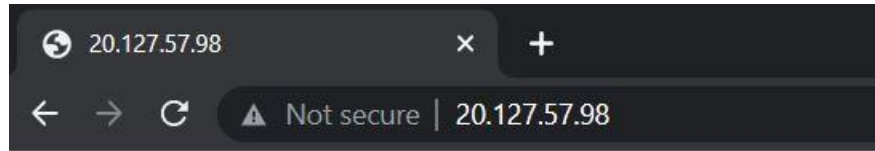
```

graph LR
    vm2[az104-06-vm2  
10.62.0.4] --> nic0[az104-06-nic0  
10.60.0.4]
    nic0 --> nic3[az104-06-nic3  
10.63.0.4]
  
```

Task 5: Implement Azure Load Balancer

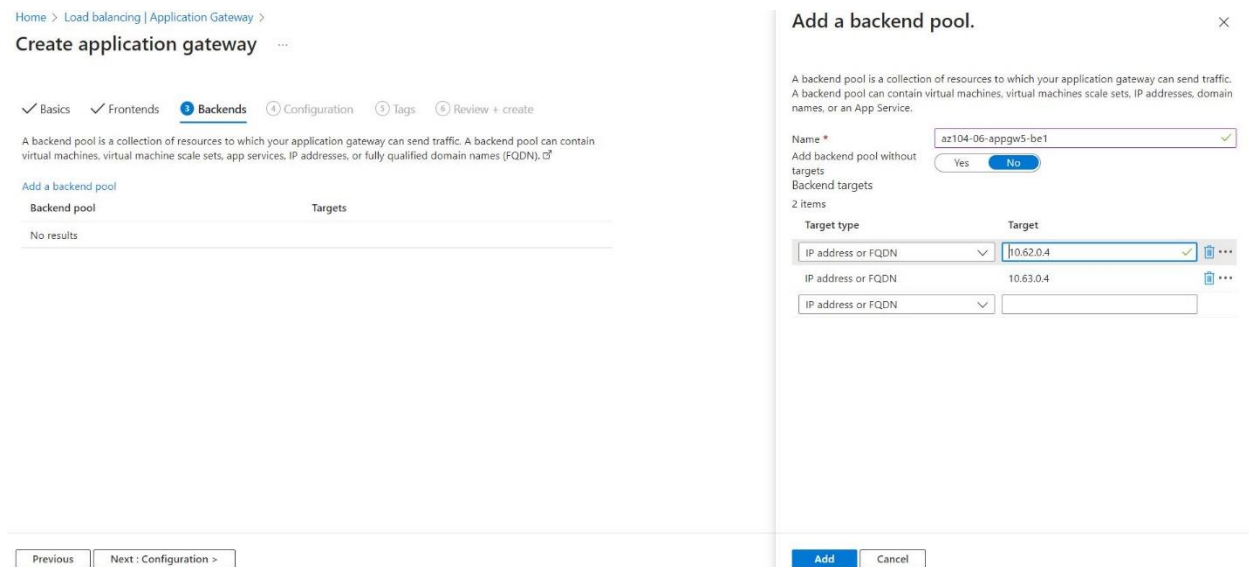
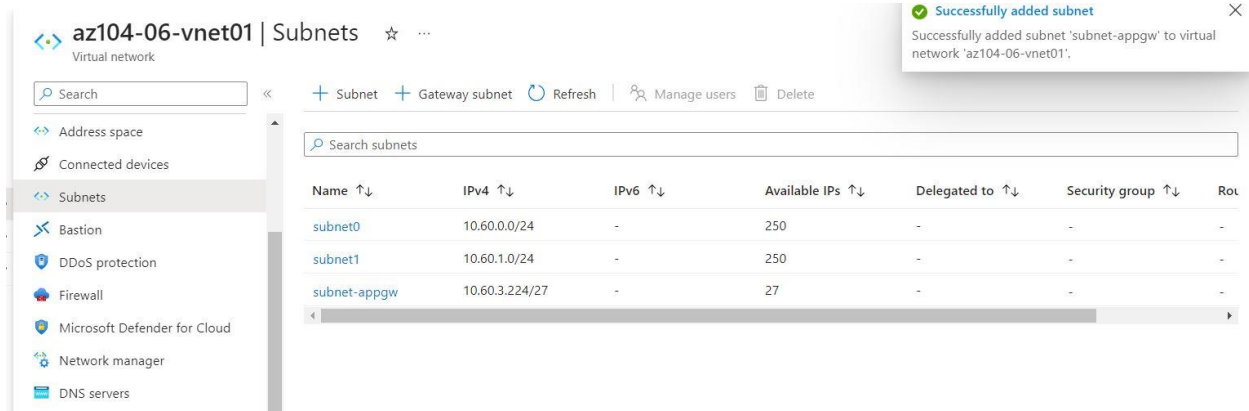
← → ↻ ⚠ Not secure | 20.127.57.98

Hello World from az104-06-vm0



Hello World from az104-06-vm1

Task 6: Implement Azure Application Gateway



Create application gateway



✓ Basics ✓ Frontends ✓ Backends **Configuration** 5 Tags 6 Review + create

Create routing rules that link your frontend(s) and backend(s). You can also add more backend pools, add a second frontend IP configuration if you haven't already, or edit previous configurations.

Frontends

+ Add a frontend IP

Public (new) az104-06-pip5

...

Routing rules

+ Add a routing rule

az104-06-appgw5-r1

Manage Backend settings

Backend pools

+ Add a backend pool

az104-06-appgw5-be1

...

Load balancing | Application Gateway

Search

+ Create Manage view

Overview

Filter for any field...

Load Balancing Services

Application Gateway

Front Door and CDN profiles

Load Balancer

Traffic Manager

Name

az104-06-appgw5

az104-06-appgw5

Search

Delete Refresh

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Configuration

Web application firewall

Backend pools

Backend settings

Frontend IP configurations

Private link

SSL settings

Listeners

Rules

Rewrites

Health probes

Essentials

Resource group (move)

az104-06-rg5

Location

East US

Subscription (move)

Azure Pass - Sponsorship

Subscription ID

3b42ed89-1120-4053-a858-c2baec72c542

Tags (edit)

Click here to add tags

Virtual network/subnet

az104-06-vnet01/subnet-appgw

Frontend public IP address

20.231.108.254 (az104-06-pip5)

Frontend private IP address

-

Tier

Standard V2

Availability zone

-

Show data for last

1 hour 6 hours 12 hours 1 day 7 days 30 days

Sum Total Requests

100

90

80

70

60

50

Hello World from az104-06-vm3

```
PowerShell > PS /home/lyubomir> Get-AzResourceGroup -Name "az104-06"
```

```
VERBOSE: Building your Azure drive ...  
PS /home/lyubomir> Get-AzResourceGroup -Name "az104-06"
```

```
ResourceGroupName : az104-06-rg1  
Location           : eastus  
ProvisioningState   : Succeeded  
Tags               :  
ResourceId          : /subscriptions/3b42ed89-112b-4053-a858-c2baec72c542/resourceGroups/az104-06-rg1
```

```
ResourceGroupName : az104-06-rg4  
Location           : eastus  
ProvisioningState   : Succeeded  
Tags               :  
ResourceId          : /subscriptions/3b42ed89-112b-4053-a858-c2baec72c542/resourceGroups/az104-06-rg4
```

```
ResourceGroupName : az104-06-rg5  
Location           : eastus  
ProvisioningState   : Succeeded  
Tags               :  
ResourceId          : /subscriptions/3b42ed89-112b-4053-a858-c2baec72c542/resourceGroups/az104-06-rg5
```

```
PS /home/lyubomir> Get-AzResourceGroup -Name "az104-06" | Remove-AzResourceGroup -Force  
Get-AzResourceGroup -Name "az104-06" | Remove-AzResourceGroup -Force  
Get-AzResourceGroup -Name "az104-06" | Remove-AzResourceGroup -Force -AsJob  
Get-AzResourceGroup -Name "az104-06" | Remove-AzResourceGroup -Force -AsJob  
Get-AzResourceGroup -Name "az104-06" | Remove-AzResourceGroup -Force -AsJob  
Get-AzResourceGroup -Name "az104-06" | Remove-AzResourceGroup -Force -AsJob  
Get-AzResourceGroup -Name "az104-06" | Remove-AzResourceGroup -Force -AsJob  
Get-AzResourceGroup -Name "az104-06" | Remove-AzResourceGroup -Force -AsJob
```

	ID	Name	PSJobTypeName	State	HasMoreData	Location	Command
--	---	----	-----	-----	-----	-----	-----
2	Long	Running	O_ AzureLongRunni_	Running	True	localhost	Remove-AzResourceGroup
3	Long	Running	O_ AzureLongRunni_	Running	True	localhost	Remove-AzResourceGroup
4	Long	Running	O_ AzureLongRunni_	Running	True	localhost	Remove-AzResourceGroup

```
PS /home/lyubomir>
```