



TECHSUMMIT19
BARRACUDA TECHNICAL SUMMIT

Microsoft Azure Troubleshooting

Barracuda CloudGen Firewall



- Resizing Cloud CGF instances
- High Availability
 - Certificate
 - Managed identities
 - Azure ELB+ILB
- Troubleshooting Azure
 - Typical issues
 - Azure CLI





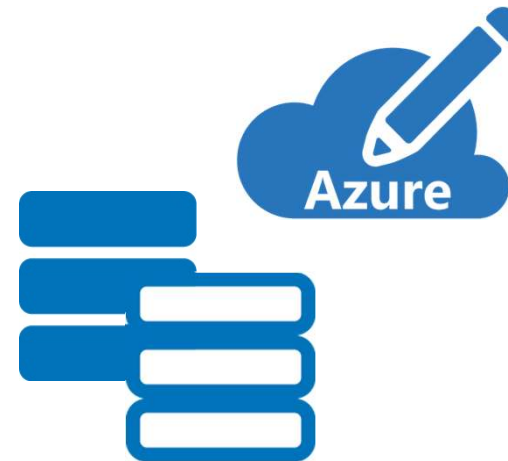
Resizing Cloud CGF Instances



Resizing Options



- Change virtual machine sizing
 - Vcpu / Memory / Storage
- Only more disk space
- Changing a license
 - CGF restore (new image)
 - Change sizing of Vcpu
 - PAYG/BYOL (new image)





- Azure virtual machines provide a combination of:
 - Compute (Number of cores)
 - Memory
 - Storage
- Different series are available: A, Av2, D, Dv2, DS, DSv2, F, ...
 - Can be resized via the cloud portal



<https://docs.microsoft.com/en-us/azure/virtual-machines/virtual-machines-linux-sizes>



Change Virtual Machine Sizing



! It is recommended to build a new Virtual Machine !

- Check the NIC name and the OS disk name of the CGF virtual machine before resizing it.

- Azure CLI

```
>az vm show -g MyResourceGroup -n MyVirtualMachineCGF  
--query storageProfile.osDisk.name
```

```
>az vm show -g MyResourceGroup -n MyVirtualMachineCGF  
--query networkProfile.networkInterfaces[].id
```

```
>az vm show -g MyResourceGroup -n MyVirtualMachineCGF  
--query plan
```



Change Virtual Machine Sizing



- Delete the CGF virtual machine

- Azure CLI

```
>az vm delete -g MyResourceGroup -n MyVirtualMachineCGF
```

- Create a new CGF instance with the existing NIC and OS disk

- Azure CLI

```
>az vm create -g MyResourceGroup -n MyVirtualMachineCGF  
--attach-os-disk MyExistingCgfOsDiskName --os-type Linux  
--nics MyExistingCgfNic --size MyNewSize_Like_Standard_F4s  
--plan-publisher barracudanetworks --plan-product barracuda-  
ng-firewall --plan-name MyExistingSku_Like_byol
```





- **PAYG**
 - Start paying for the new license size immediately
- **BYOL**
 - Will need a larger license ordered before resizing
 - Once resized , the new license must be applied.

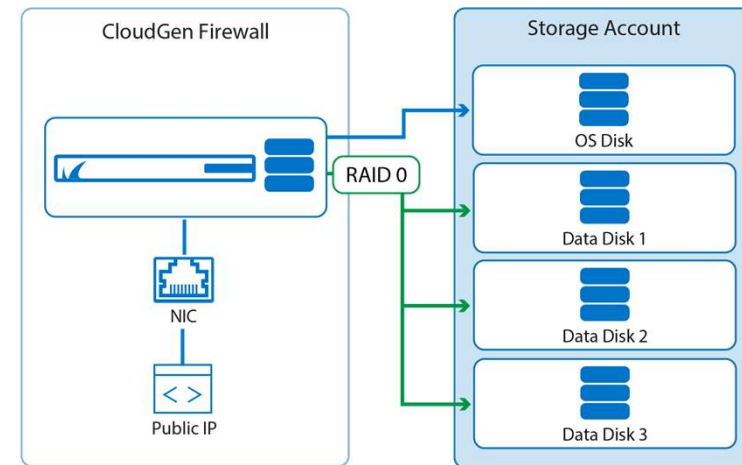


You may only need to parallel build if Azure is restricting the types of instances you can resize to. This is most likely to be a problem for very old ASM deployments.





- **RAID0 using multiple data disks**
 - Up to 2 TB storage
 - Up to 26 data disks
- **Add data disks**
 - Automatic during deployment
 - Shell script for existing VMs



If you require more performance
you need a greater number of IOPS





Changing a License





- CloudGen Firewall and Firewall Admin need internet access
- BYOL – Bind to the VM UUID
 - Restoring a BYOL par onto a new BYOL box will report a license error
- PAYG – Bind to the VM UUID
 - Activation and licensing is completed during initial deployment
 - Restoring a PAYG backup onto a new PAYG box will replace the activated license ☹️



Always make a copy of the new PAYG box license before restoring a PAR





- Boxes on PAYG keep a backup of the license they were provisioned with. This can be recovered:

```
> cloud-restore-license -h
```

Restore the auto-generated license on a PAYG box.

Options:

-f	force license overwrite
-h	print this help and exit



From PAYG to BYOL Variations



- When changing (PAYG <-> BYOL) license type, you must rebuild the instance from the correct marketplace image.
- Converting from PAYG to BYOL licenses or the reverse
 - 1) Back up the Existing Firewall Configuration
 - 2) Redeploy Firewall using the Desired Image Type (BYOL or PAYG)
 - 3) (PAYG only) Export the PAYG License
 - 4) Restore the Configuration from PAR File
 - 5) License the Firewall



Backup and Restore



- Where is my backup?
- No license change on existing image
- NEW license for new image
- Restoring a CloudGen Firewall from a PAR file
 - PAYG
 - BYOL



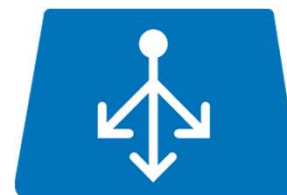


CGF High Availability...

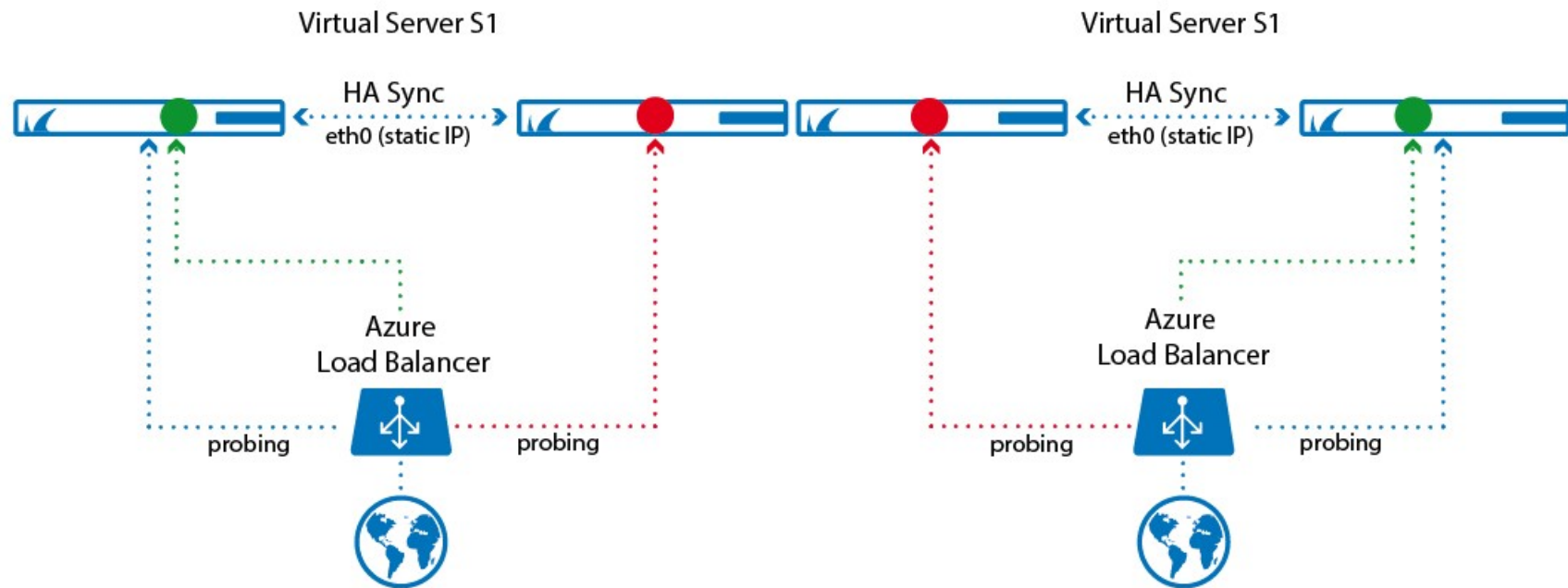




- Cloud integration
 - Certificates
 - Integrity
- Standard Load Balancer



High Availability - Inbound



CGF High Availability Cluster



- **Concept**

- Static private IP addresses required
- Use client-to-site VPN and internal private IPs to manage firewalls
- Azure Load Balancer probes service on virtual server

- **Requirements**

- Single network interfaces must be used
- Both VMs must be in the same subnet of the virtual network
- Both VMs must be deployed in one availability set
- Both firewalls must be the same Azure model and instance size





Which Failover Method?



There are now two failover methods available in Azure:

- **Cloud Integration (original method)**
 - This works by giving the CGF permission over the UDR. The FW rewrites route tables to point to the active device.
- **Standard or HA Port Load Balancer (new method)**
 - This is a new type of load balancer that allows an internal load balancer.
 - Routes are pointed at the LB, and the LB probes to see which firewall is active.



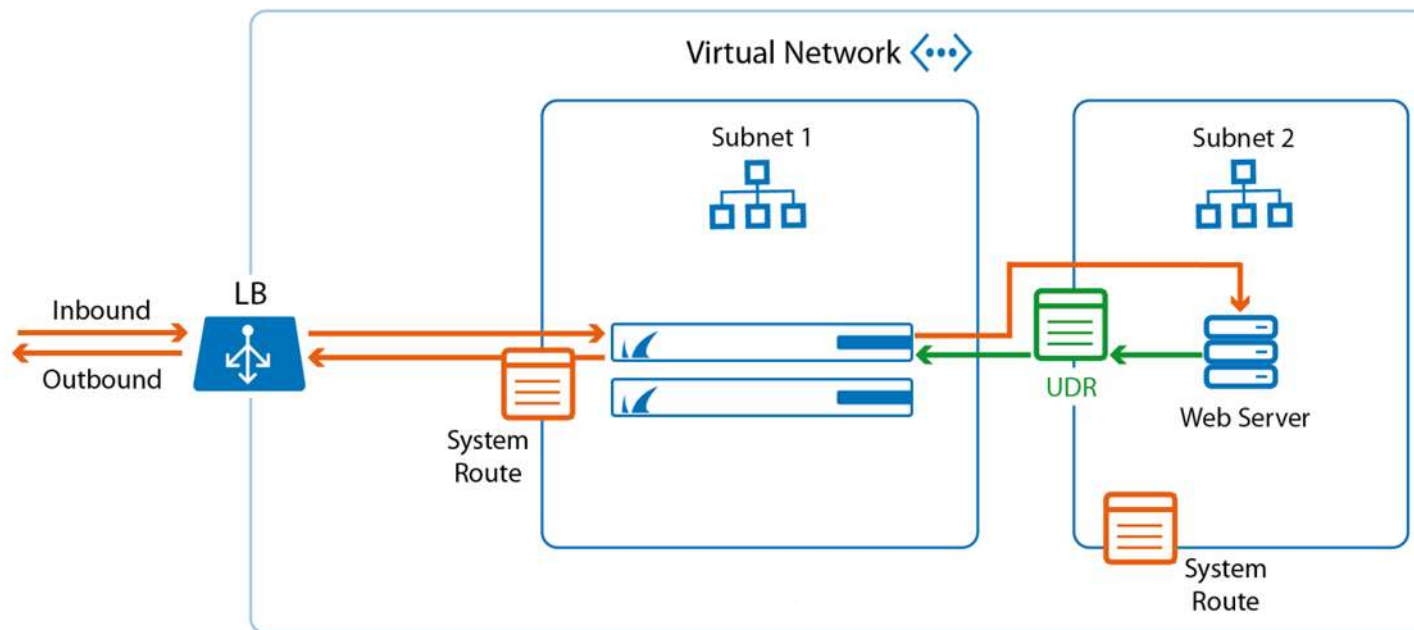
Failover Method Comparison



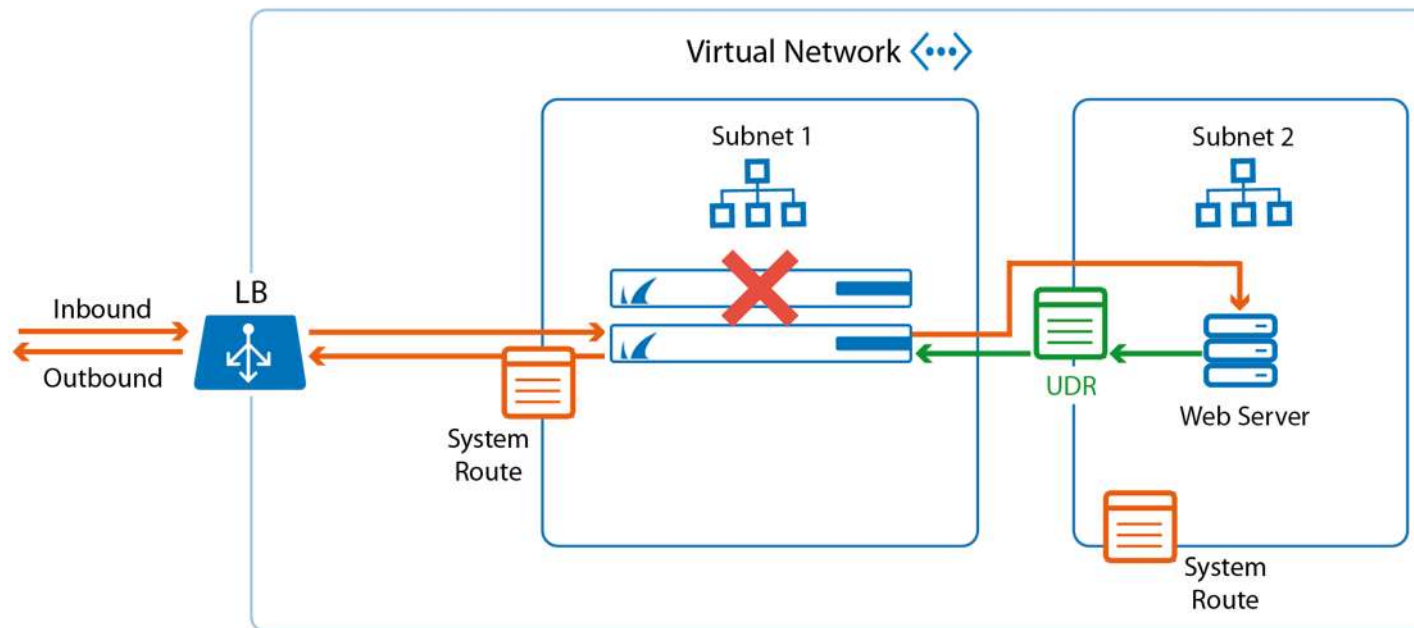
Method	Pros	Cons
Cloud Integration	<ul style="list-style-type: none">• ~60-second failover• No additional costs	<ul style="list-style-type: none">• Doesn't support multiple VNET's without Azure Automation code.• Can be complex to set up• Will fail if permissions get changed
Standard LB	<ul style="list-style-type: none">• Failover in ~15 seconds• Stateful failover• Simple to set up	<ul style="list-style-type: none">• Microsoft charges for volume of data through LB• Hard to migrate to when new IPs are allocated



Cloud Integration – User-Defined Routing



Cloud Integration – User-Defined Routing





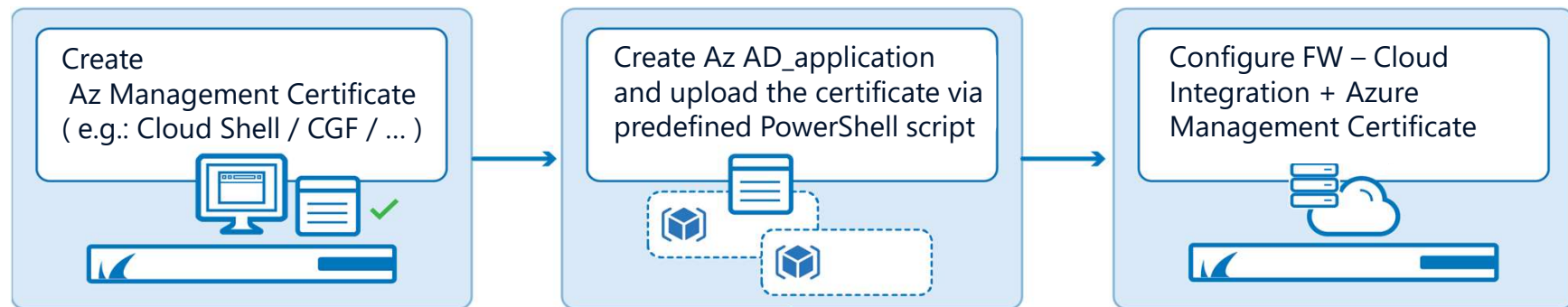
- Next-hop IP of UDR routes are actively monitored by firewall
- On failover, the active firewall rewrites UDR routes
 - Next-hop IP is rewritten to IP of active firewall
- Failover not transparent
 - Active sessions time out
- Routing order if 2 or more matches with the same prefix
 - User-Defined Route
 - BGP Route
 - System Route



Azure API – Certificate Authentication



- Connect to Azure APIs



```
#####  
# Cloud Integration for CloudGen Firewall F  
#####  
"  
  
$pathToCERfile = 'arm.cer'  
$ADAppName = 'CGFapp'  
# Set the resource group the Azure Route Table is in  
$resourceGroupName = 'HAbasic-RG'  
# your subscription ID - the subscription ID must be entered with the dashes, as displayed by the Login-AzureRmAccount commandlet  
$subscriptionID = '/subscriptions/Barracuda-a9a8-4b24-9164-MySubscription'  
  
# the identifier and role name must both be unique  
$identifier = 'http://localhost'  
$roleName = 'NGF Role'
```





- How to check expired date of the certificate:

- PowerShell

```
>Get-AzureRmADApplication
```

```
>Get-AzureRmADAppCredential -DisplayName CGFapp
```

- Azure CLI

```
>az ad app list --display-name CGF --query '[[0].keyCredentials]'
```

- Portal

Azure Active Directory / App registrations

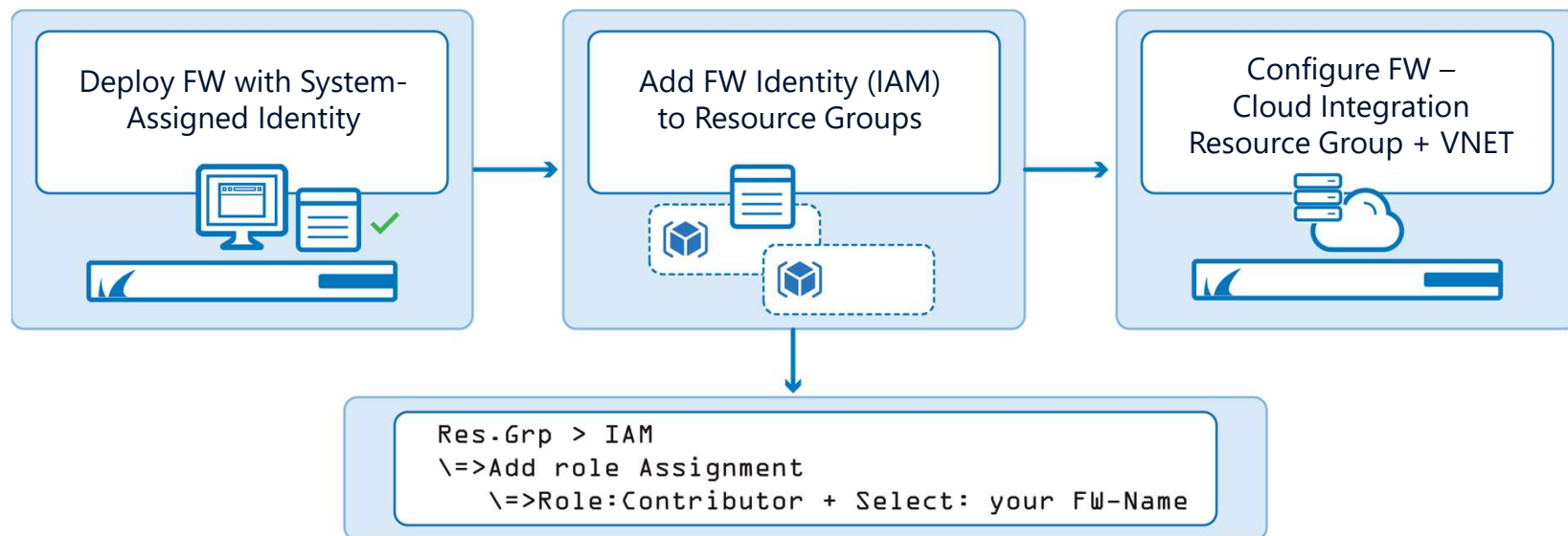
\=> select your App > Certificates secrets



Azure API – Azure Managed Identities



- Connect to Azure APIs (CGF > 7.2.2)
 - Up to 2 hours delay on Azure after first configuration



Azure API – Activate Managed Identity



- Check the principal ID of the CGF virtual machine

- Azure CLI

```
>az vm show -g MyResourceGroup -n MyVirtualMachineCGF  
--query identity.principalId
```

- Create a new role assignment for your service principal

- Azure CLI

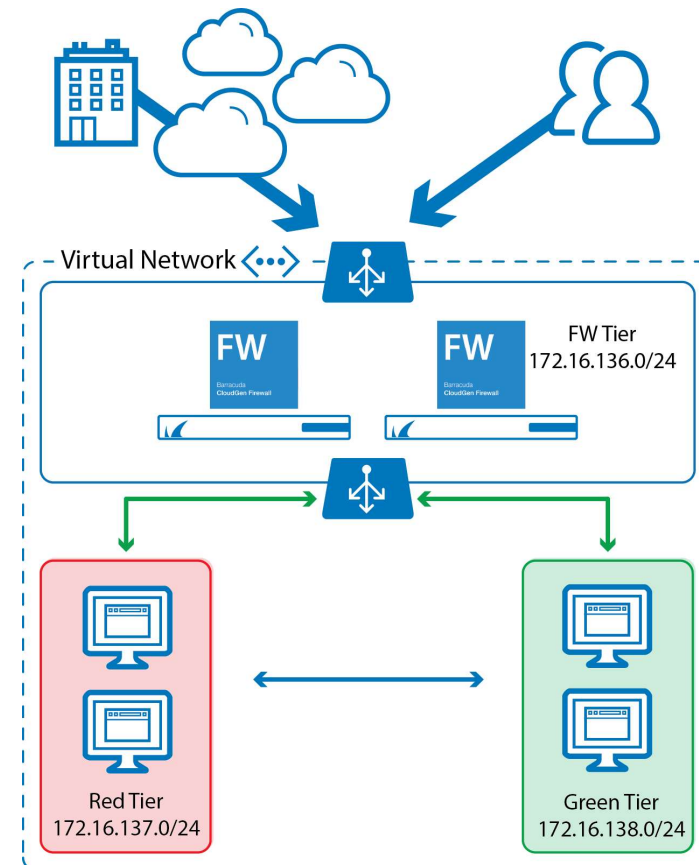
```
>az role assignment create --assignee-object-id  
MyVirtualMachineCgfPrincipalId --resource-group  
MyResourceGroup --role Contributor
```



HA Using Internal Load Balancer



- HA with standard Load Balancer
 - Availability Zones
 - Peered VNets
 - NO - CGF Cloud Integration
 - Shorter failover time (< 15s)





Troubleshooting Azure...





- Main causes of traffic not reaching the firewalls:
 - Network Security Groups are blocking
 - User-defined routes are not correct
 - Load Balancers are not successfully polling, so fail closed

The screenshot displays the Azure portal interface for the 'mgmtclient190' network interface. The left sidebar shows the 'Networking' section selected. The main content area is divided into three panes: 'mgmtclient190 - Effective', 'mgmtclient190 - Effective routes', and a table of effective routes.

mgmtclient190 - Effective routes

Scope: Network interface (mgmtclient190)

Effective routes

SOURCE	STATE	ADDRESS PREFIXES	NEXT HOP TYPE	NEXT HOP TYPE IP ADDRESS	USER DEFINED ROUTE NAME
Default	Active	172.16.136.0/22	Virtual network	-	-
Default	Invalid	0.0.0.0/0	Internet	-	-
User	Active	0.0.0.0/0	Virtual appliance	172.16.136.4	to-Internet
User	Active	172.16.137.0/29	Virtual appliance	172.16.136.4	to-Red

FW

Barracuda
CloudGen Firewall

Cluster Troubleshooting – Check the LBs



Source: Traffic Inbound
from Internet



You can't see the traffic
appearing in the FW
History view.

Source: Traffic Outbound or
between Subnets/VNETs

Example of successful monitoring polls on port 65500 or 691

AD	Source	Destination	IP Proto	Output IP	Interface	Out	Port	Src	Dest	Dir NAT	Next Hop	Protocol	Count	Rule
✓	192.168.1.10	172.16.138.20	TCP	eth0	eth0	out	65500	192.168.1.10	172.16.138.20	172.16.138.17	172.16.138.17	TCP	4	CLUSTER-INTERNAL-HEALTH
✓	192.168.1.10	172.16.138.20	TCP	eth0	eth0	out	691	192.168.1.10	172.16.138.20	172.16.138.17	172.16.138.17	TCP	4	CLUSTER-INTERNAL-HEALTH

Inbound Rules allowing traffic

NAME	LOCAL SECURITY NAME	BACKEND-POOL	HEALTH-PROB
IPSEC-HE	IPSEC-HE (UDP-65500)	loadBalancerBackend	TrueProbe
IPSEC-NAT7	IPSEC-NAT7 (UDP-65500)	loadBalancerBackend	TrueProbe
TINA-TCP	TINA-TCP (TCP-65500)	loadBalancerBackend	TrueProbe
TINA-UDP	TINA-UDP (UDP-65500)	loadBalancerBackend	TrueProbe

Standard ILB rule allowing all ports (HA Ports)

Rule configuration for Standard ILB rule allowing all ports (HA Ports).

Name:

IP Version: ☒ IPv4 ☐ IPv6

Backend IP address:

Health probe:

Session persistence:

Max timeout (seconds):

Floating IP (direct server return):

NSG for CGF that permits All Inbound and Outbound traffic

Network security group EUS2LAB-NSG-NGF (attached to subnet: EUS2LAB-SUBNET-NGF)

Impacts 3 subnets, 0 network interfaces

PRIORITY	NAME	PORT	PROTOCOL	SOURCE	DESTINATION	ACTION
100	AllowAnyInbound	1-65535	Any	Any	Any	Allow
65000	AllowInetInbound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalancerInbound	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInbound	Any	Any	Any	Any	Deny

Network security group EUS2LAB-NSG-NGF (attached to subnet: EUS2LAB-SUBNET-NGF)

Impacts 3 subnets, 0 network interfaces

PRIORITY	NAME	PORT	PROTOCOL	SOURCE	DESTINATION	ACTION
100	AllowAnyOutbound	1-65535	Any	Any	Any	Allow
65000	AllowInetOutbound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowInternetOutbound	Any	Any	Any	Internet	Allow
65500	DenyAllOutbound	Any	Any	Any	Any	Deny



General Troubleshooting – Check the Flow

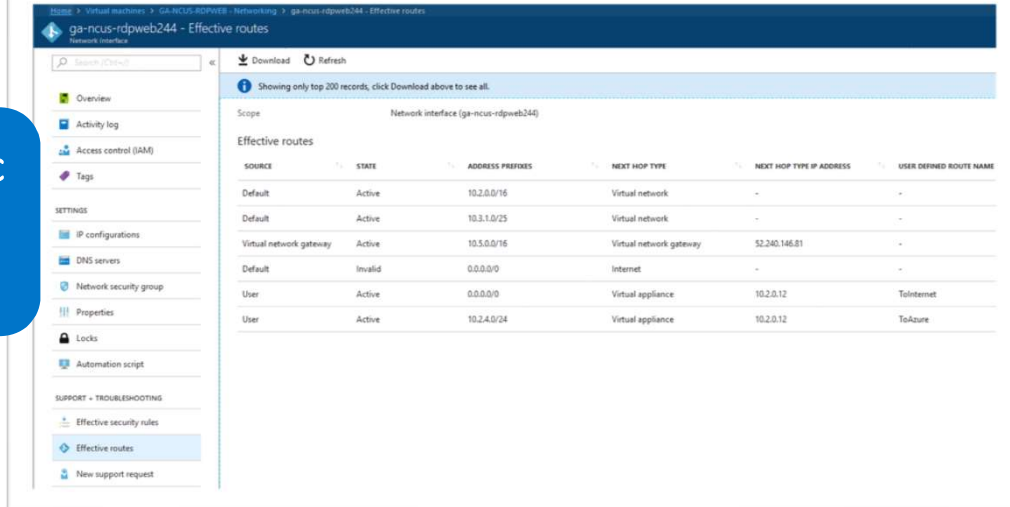
Source: Traffic Inbound
from Internet



You can't see the traffic
appearing in the FW
History view.

Source: Traffic Outbound or
between Subnets/VNETs

Effective Route example where traffic to Internet and other subnet route through CGF



SOURCE	STATE	ADDRESS PREFIXES	NEXT HOP TYPE	NEXT HOP TYPE IP ADDRESS	USER DEFINED ROUTE NAME
Default	Active	10.2.0.0/16	Virtual network	-	-
Default	Active	10.3.1.0/25	Virtual network	-	-
Virtual network gateway	Active	10.5.0.0/16	Virtual network gateway	52.240.146.81	-
Default	Invalid	0.0.0.0/0	Internet	-	-
User	Active	0.0.0.0/0	Virtual appliance	10.2.0.12	ToInternet
User	Active	10.2.4.0/24	Virtual appliance	10.2.0.12	ToAzure



General Troubleshooting – Check the Flow

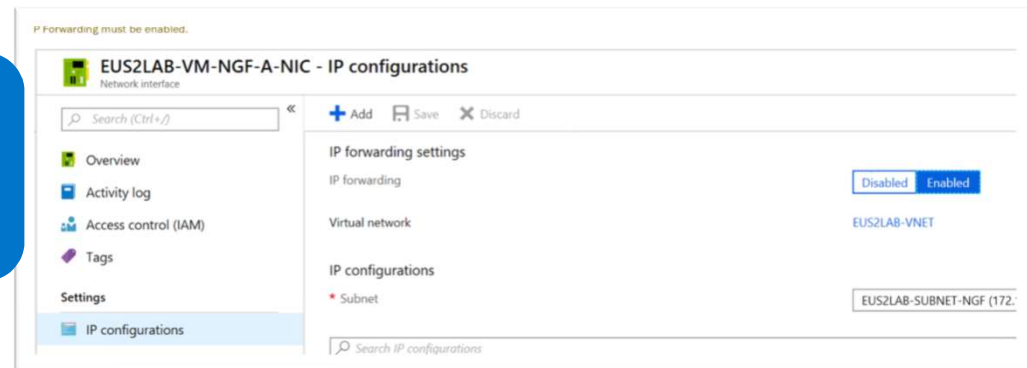
Source: Traffic Inbound
from Internet



You see the traffic, but
receive a Connection
Timeout.

Source: Traffic Outbound or
between Subnets/VNETs

- **Check the Dynamic NAT connection object on the rule.**



- **Check the NSGs on the receiving or sending instances.**





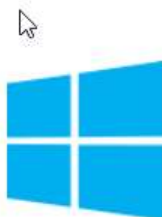
Microsoft Azure CLI



Azure CLI Overview



- Cross-platform interface for managing Azure resources



Windows 10



Ubuntu 16.04+



macOS



Azure Cloud Shell



Login to Azure



Azure CLI (Examples)



- > `az group list -o table`
- > `az network vnet list -o table`
- > `az network vnet subnet list -g YourResourceGroup --vnet-name YourVnet -o table`
- > `az network route-table list -g YourResourceGroup -o table`
- > `az network route-table route list -g YourResourceGroup --route-table-name YourRoutingTableName -o table`



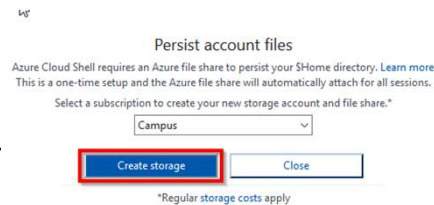
Azure Cloudshell – First Time



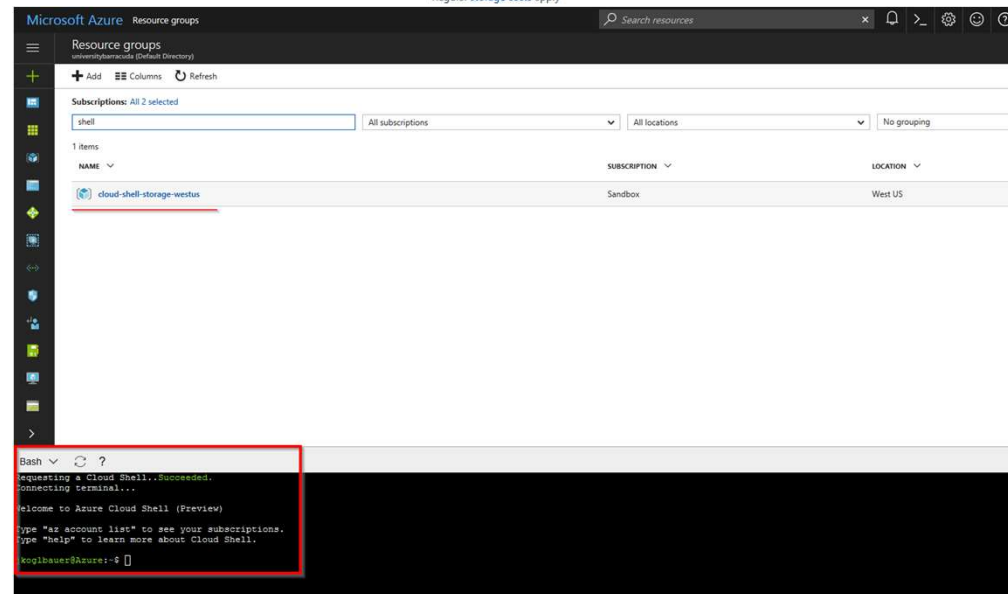
1



2



3



Azure Cloudshell – Group



- `az group list -o table`

The screenshot displays the Microsoft Azure portal interface. On the left, the 'Resource groups' menu item is highlighted with a red box. The main pane shows a list of resource groups under the 'universitybarracuda (Default Directory)' subscription. Below this, the Azure Cloud Shell terminal is open, showing the command `az group list -o table` being executed, which is also highlighted with a red box. The terminal output lists three resource groups: 'cloud-shell-storage-westus', 'EU1-BTN320-9', and 'hfeutl', each with its location and status.

Name	Location	Status
cloud-shell-storage-westus	westus	Succeeded
EU1-BTN320-9	westeurope	Succeeded
hfeutl	westeurope	Succeeded



Azure Cloudshell – Resource



- `az resource list -g YourResourceGroup -o table`

The screenshot shows the Azure portal interface for the resource group 'EU1-BTN320-9'. The 'Overview' tab is selected, and a table of resources is displayed. The resources listed are:

NAME	TYPE	LOCATION
BTN320-01	Network security group	West Europe
MgmtSrv	Virtual machine	West Europe
MgmtSrvNIC	Network interface	West Europe
NG-AS	Availability set	West Europe
NGFWa	Virtual machine	West Europe
NGFWaNIC	Network interface	West Europe
PIP-NG	Public IP address	West Europe

Below the screenshot, the command `az resource list -g EU1-BTN320-9 -o table` is executed in the Azure Cloudshell, showing the output as a table:

Name	ResourceGroup	Location	Type	Status
EU1-BTN320-9	EU1-BTN320-9	westeurope	Microsoft.Compute/availabilitySets	
NG-AS	EU1-BTN320-9	westeurope	Microsoft.Compute/virtualMachines	
MgmtSrv	EU1-BTN320-9	westeurope	Microsoft.Compute/virtualMachines	
WebServer	EU1-BTN320-9	westeurope	Microsoft.Compute/virtualMachines/extensions	
WebServer/CustomScriptForLinux	EU1-BTN320-9	westeurope	Microsoft.Compute/virtualMachines/extensions	
MgmtSrvNIC	EU1-BTN320-9	westeurope	Microsoft.Network/networkInterfaces	
NGFWaNIC	EU1-BTN320-9	westeurope	Microsoft.Network/networkInterfaces	
WebSrvNIC	EU1-BTN320-9	westeurope	Microsoft.Network/networkInterfaces	
BTN320-01	EU1-BTN320-9	westeurope	Microsoft.Network/networkSecurityGroups	
PIP-NG	EU1-BTN320-9	westeurope	Microsoft.Network/publicIPAddresses	
Server-Route-Table	EU1-BTN320-9	westeurope	Microsoft.Network/routeTables	
WebSrv-Route-Table	EU1-BTN320-9	westeurope	Microsoft.Network/routeTables	
StorageAccount	EU1-BTN320-9	westeurope	Microsoft.Storage/storageAccounts	



Azure Cloudshell – Resource



- `az resource list -g YourResourceGroup --resource-type Microsoft.Network/virtualNetworks -o table`

The screenshot displays the Microsoft Azure portal interface. The top navigation bar shows 'Resource groups' and 'EU1-BTN320-9'. The left sidebar lists various resource types, with 'Virtual networks' highlighted. The main content area shows the 'Overview' tab for the resource group, with a filter set to 'Virtual networks'. Below the portal, a terminal window shows the command 'az resource list -g EU1-BTN320-9 --resource-type Microsoft.Network/virtualNetworks -o table' and its output.

```
Bash
$ az resource list -g EU1-BTN320-9 --resource-type Microsoft.Network/virtualNetworks -o table
Name                                ResourceGroup    Location    Type
-----
vNet-BTN320-01                     EU1-BTN320-9     westeurope Microsoft.Network/virtualNetworks
```





Resource List:

- `az resource list -g YourResourceGroup -o table`
- `az resource list -g YourResourceGroup --resource-type Microsoft.Network/virtualNetworks -o table`
- `az resource list -g YourResourceGroup --query "[?contains(type, 'Microsoft.Network')].{Datacenter:location, Name:name, Resource:type}" -o table`



Azure Cloudshell – Network



- `az network vnet list -g YourResourceGroup -o table`

The screenshot shows the Microsoft Azure portal interface for 'Virtual networks'. The 'Virtual networks' tab is selected and highlighted with a red box. Below the navigation pane, there are filters for 'Subscriptions: 1 of 2 selected', 'Filter by name...', 'Sandbox', and 'All locations'. A table lists 1 item:

NAME	RESOURCE GROUP	LOCATION
vNet-BTN320-01	EUI-BTN320-9	West Europe

The 'vNet-BTN320-01' entry is highlighted with a red line. In the bottom left of the portal, a terminal icon is highlighted with a red box. Below the portal, a terminal window shows the command `az network vnet list -o table` being executed, with the command text highlighted by a red box. The output of the command is shown in a table:

Location	Name	ProvisioningState	ResourceGroup	ResourceGuid
westeurope	vNet-BTN320-01	Succeeded	EUI-BTN320-9	5faa15e9-e961-4a81-b4fd-7060700e4baa



Azure Cloudshell – Network



- `az network vnet subnet list -g YourResourceGroup --vnet-name YourVnet -o table`

Microsoft Azure Virtual networks vNet-BTN320-01

Virtual networks universitybarracuda (Default Directory)

Subscriptions: 1 of 2 selected

Filter by name...

1 items

NAME
vNet-BTN320-01

Overview

Activity log

Access control (IAM)

Tags

SETTINGS

Address space

Connected devices

Subnets

DNS servers

Peerings

Properties

Essentials

Resource group (change) EU1-BTN320-9

Location West Europe

Subscription name (change) Sandbox

Subscription ID 25ebdaeb-a9a8-4b24-9164-1879a0661ae9

Address space 10.8.0.0/16

DNS servers Azure provided DNS service

3 connected devices

DEVICE	TYPE	IP ADDRESS	SUBNET
NGFWaNIC	Network interface	10.8.1.4	ngnet
MgmtSrvNIC	Network interface	10.8.3.4	tsnet
WebSrvNIC	Network interface	10.8.2.4	webnet

Bash

```
jkoglbauer@Azure:~$ az network vnet list -g EU1-BTN320-9 -o table
Location  Name      ProvisioningState  ResourceGroup  ResourceGuid
-----
westeurope vNet-BTN320-01 Succeeded         EU1-BTN320-9   5fa15e9-e961-4a81-b4fd-7060700e4baa

jkoglbauer@Azure:~$ az network vnet subnet list --vnet-name vNet-BTN320-01 -g EU1-BTN320-9 -o table
AddressPrefix  Name      ProvisioningState  ResourceGroup
-----
10.8.1.0/24    ngnet     Succeeded          EU1-BTN320-9
10.8.3.0/24    tsnet     Succeeded          EU1-BTN320-9
10.8.2.0/24    webnet    Succeeded          EU1-BTN320-9
```



Azure Cloudshell – Network



- `az vm list-ip-addresses -o table`

Microsoft Azure Network interfaces

Search resources

Network interfaces

universitybarracuda (Default Directory)

+ Add Columns Refresh

Subscriptions: 1 of 2 selected

Filter by name... Sandbox All locations

3 items

NAME	VIRTUAL NETWORK	PRIMARY PRIVATE IP	ATTACHED TO
MgmtSrvNIC	vNet-BTN320-01	10.8.3.4	MgmtSrv
NGFWaNIC	vNet-BTN320-01	10.8.1.4	NGFWa
WebSrvNIC	vNet-BTN320-01	10.8.2.4	Webserver

Bash

```
jkgibauer@Azure:~$ az vm list-ip-addresses -o table
VirtualMachine
-----
MgmtSrv      10.8.3.4
NGFWa        10.8.1.4
Webserver    10.8.2.4
jkgibauer@Azure:~$
```



Azure Cloudshell – Network



- `az network nic list -g YourResourceGroup -o table`

The screenshot displays the Microsoft Azure portal's 'Network interfaces' page. The page shows a table with 3 items, each representing a network interface card (NIC) attached to a virtual network. The table columns are NAME, VIRTUAL NETWORK, PRIMARY PRIVATE IP, ATTACHED TO, RESOURCE GROUP, and LOCATION. The items listed are MgmtSrvNIC, NGFWaNIC, and WebSrvNIC, all attached to vNet-BTN320-01 in the EU1-BTN320-9 resource group in West Europe.

Below the portal screenshot, the Azure Cloudshell terminal is shown. The command `az network nic list -o table` has been executed, resulting in a table output. The command and its output are highlighted with red boxes in the original image.

Location	Name	Subnet	SourceRange	State	ResourceGroup	ResourceGuid	EnableIpForwarding
westeurope	MgmtSrvNIC	True	Succeeded	EU1-BTN320-9	99fc46a0-2299-41da-9a73-cab5ba1cbd46		
westeurope	NGFWaNIC	True	Succeeded	EU1-BTN320-9	f0d8049e-b7c5-4a2a-ac75-b07889240924		True
westeurope	WebSrvNIC	True	Succeeded	EU1-BTN320-9	9216e880-b6cd-4c5b-8c10-9abb0de77e29		



Azure Cloudshell – Network



- `az network nic show -g YourResourceGroup -n YourNicName --query ipConfigurations -o table`

The screenshot displays the Azure portal interface for a network interface named NGFWaNIC. The 'IP configurations' tab is selected, showing a table with one configuration: ipconfig1, IPv4, Primary, 10.8.1.4 (Static). Below the portal, a terminal window shows the command 'az network nic show -g EUL-BTN320-9 -n NGFWaNIC --query ipConfigurations -o table' and its output.

NAME	IP VERSION	TYPE	PRIVATE IP ADDRESS
ipconfig1	IPv4	Primary	10.8.1.4 (Static)

```

Bash
[koglbauer@Azure:~]$ az network nic list -g EUL-BTN320-9 -o table
-----
Location  Name      Primary  ProvisioningState  ResourceGroup  ResourceGuid  EnableIpForwarding
-----
westeurope MgmtSrvNIC True      Succeeded          EUL-BTN320-9   99fc6ea0-2299-41da-9a73-cab8babcdb46  True
westeurope NGFWaNIC  True      Succeeded          EUL-BTN320-9   40d049e-b7c5-4a2e-ac75-b07889240244
westeurope WebSrvNIC  True      Succeeded          EUL-BTN320-9   9216e880-b6cd-4c5b-8c18-9dbb0de77e29
[koglbauer@Azure:~]$ az network nic show -g EUL-BTN320-9 -n NGFWaNIC --query ipConfigurations -o table
-----
PrivateIpAllocationMethod PrivateIpAddress PrivateIpAddressesVersion ResourceGroup Primary ProvisioningState Name
-----
Static 10.8.1.4 IPv4 EUL-BTN320-9 True Succeeded ipconfig1
[koglbauer@Azure:~]$
  
```



Azure Cloudshell – Network



- `az vm nic list -g YourResourceGroup --vm-name YourVmName -o tsv`
- `az vm nic show -g YourResourceGroup --vm-name YourVmName --nic YourNicName --query ipConfigurations -o table`

Microsoft Azure Virtual machines NGFWa - Network interfaces

Virtual machines (Classic) can now be managed together in the combined list below.

Subscriptions: 1 of 2 selected

Filter by name...

3 items

NAME
MgmtSrv
NGFWa
Webserver

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

SETTINGS

Availability set

Disks

Extensions

Network interfaces

NAME	PUBLIC IP ADDRESS	PRIVATE IP ADDRESS
NGFWaNIC	-	10.8.1.4

Bash

```
kgblbauer@Azure: ~$ az vm nic list --resource-group EUI-BTN320-9 --vm-name NGFWa -o tsv
/subscriptions/25ebdaeb-89a8-4b24-9164-1879a0661ae9/resourceGroups/EUI-BTN320-9/providers/Microsoft.Network/networkInterfaces/NGFWaNIC None EUI-BTN320-9
kgblbauer@Azure: ~$
```





- `az network route-table list -o table`

The screenshot displays the Microsoft Azure portal interface for managing route tables. The top navigation bar shows 'Route tables' with a search bar. The left sidebar contains various service icons, with the 'Route tables' icon highlighted. The main content area shows a list of route tables with the following details:

NAME	RESOURCE GROUP	LOCATION
Server-Route-Table	EU1-BTN320-9	West Europe

Below the portal view, the Azure Cloudshell terminal is open, showing the command `az network route-table list -o table` being executed. The output of the command is as follows:

```
Location Name Provisioningstate ResourceGroup
-----
westeurope Server-Route-Table Succeeded EU1-BTN320-9
```



Azure Cloudshell – Network



- `az network route-table route list -g YourResourceGroup --route-table-name YourRoutingTableName -o table`

Microsoft Azure Route tables Server-Route-Table

Route tables

Subscriptions: 1 of 2 selected

Filter by name...

1 items

NAME

Server-Route-Table

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

SETTINGS

Routes

Subnets

Essentials

Resource group (change) EU1-BTN320-9

Associations 2 subnet associations

Location West Europe

Subscription name (change) Sandbox

Subscription ID 25ebdaeb-a9a8-4b24-9164-1879a0661ae9

Search routes

NAME	ADDRESS PREFIX	NEXT HOP
NG-Default	0.0.0.0/0	10.8.1.4

Search subnets

Bash

```
jkgibauer@Azure:~$ az network route-table list -o table
Location Name ProvisioningState ResourceGroup
-----
westeurope Server-Route-Table Succeeded EU1-BTN320-9
jkgibauer@Azure:~$ az network route-table list -g EU1-BTN320-9 -o table
Location Name ProvisioningState ResourceGroup
-----
westeurope Server-Route-Table Succeeded EU1-BTN320-9
jkgibauer@Azure:~$ az network route-table route list -g EU1-BTN320-9 --route-table-name Server-Route-Table -o table
AddressPrefix Name NextHopIpAddress NextHopType ProvisioningState ResourceGroup
-----
0.0.0.0/0 NG-Default 10.8.1.4 VirtualAppliance Succeeded EU1-BTN320-9
```



Azure Cloudshell – Network



- `az network route-table show -g YourResourceGroup -n YourRoutingTableName --query subnets`

The screenshot shows the Microsoft Azure portal interface for a 'Server-Route-Table' resource. The 'Overview' tab is selected, displaying a table of subnets. The 'tinet' and 'webnet' subnets are highlighted with red boxes. Below the portal screenshot, a terminal window shows the command 'az network route-table show -g EU1-BTN320-9 -n Server-Route-Table --query subnets' and its output, which lists the subnets 'tinet' and 'webnet' with their respective address ranges and virtual networks.

NAME	ADDRESS PREFIX	NEXT HOP
NG-Default	0.0.0.0/0	10.8.1.4

NAME	ADDRESS RANGE	VIRTUAL NETWORK	SEC
tinet	10.8.3.0/24	vNet-BTN320-01	-
webnet	10.8.2.0/24	vNet-BTN320-01	-

```

Bash
?
Microsoft Azure Server-Route-Table Succeeded EU1-BTN320-9
az network route-table show -g EU1-BTN320-9 --route-table-name Server-Route-Table -o table
-----
AddressPrefix Name NextHopAddress NextHopType ProvisioningState ResourceGroup
-----
0.0.0.0/0 NG-Default 10.8.1.4 VirtualApplance Succeeded EU1-BTN320-9
Microsoft Azure: az network route-table show -g EU1-BTN320-9 -n Server-Route-Table --query subnets
{
  "addressPrefix": null,
  "etag": null,
  "id": "/subscriptions/25ebdaeb-a9a8-4b24-9164-1879a0661ae9/resourceGroups/EU1-BTN320-9/providers/Microsoft.Network/virtualNetworks/vNet-BTN320-01/subnets/tinet",
  "ipConfigurations": null,
  "name": null,
  "networkSecurityGroup": null,
  "provisioningState": null,
  "resourceGroup": "EU1-BTN320-9",
  "resourceReligionLinks": null,
  "routeTable": null
},
{
  "addressPrefix": null,
  "etag": null,
  "id": "/subscriptions/25ebdaeb-a9a8-4b24-9164-1879a0661ae9/resourceGroups/EU1-BTN320-9/providers/Microsoft.Network/virtualNetworks/vNet-BTN320-01/subnets/webnet",
  "ipConfigurations": null,
  "name": null,
  "networkSecurityGroup": null,
  "provisioningState": null,
  "resourceGroup": "EU1-BTN320-9",
  "resourceReligionLinks": null,
  "routeTable": null
}

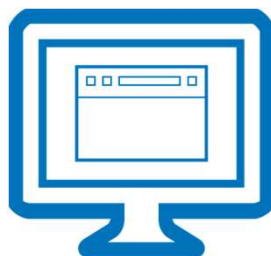
```



Azure Cloudshell – Network



- ONLY when the virtual machine is RUNNING:
 - `az network nic list-effective-nsg -g YourResourceGroup -n YourNicName`
 - `az network nic show-effective-route-table -g YourResourceGroup -n YourNicName`



Azure Cloudshell – Load Balancer



- `az network lb list -g YourResourceGroup -o table`
- `az network public-ip list -g YourResourceGroup -o table`
- `az network lb frontend-ip list -g YourResourceGroup --lb-name MyLoadBalancer-ELB-CGF --query "[].{Name:name,PublicIpName:publicIpAddress.id}" -o table`
- `az network lb rule list -g YourResourceGroup --lb-name YourLoadBalancerName -o table`
- `az network lb probe list -g YourResourceGroup --lb-name YourLoadBalancerName -o table`



Azure Cloudshell – Network Security Gp



- `az network nsg list -g MyResourceGroup -o table`
- `az network nsg rule list -g MyResourceGroup --nsg-name MyNwSgxx -o table`
- **BASH ONLY:**
 - `az network nsg list -g MyResourceGroup --query "[].{name:name,NIC:networkInterfaces[].id |[0:],Subnets:subnets[].id |[0:]}" | sed 's!/subscriptions/.*/Microsoft.Network/!!'`





Thank you

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