
Microsoft

Microsoft Azure

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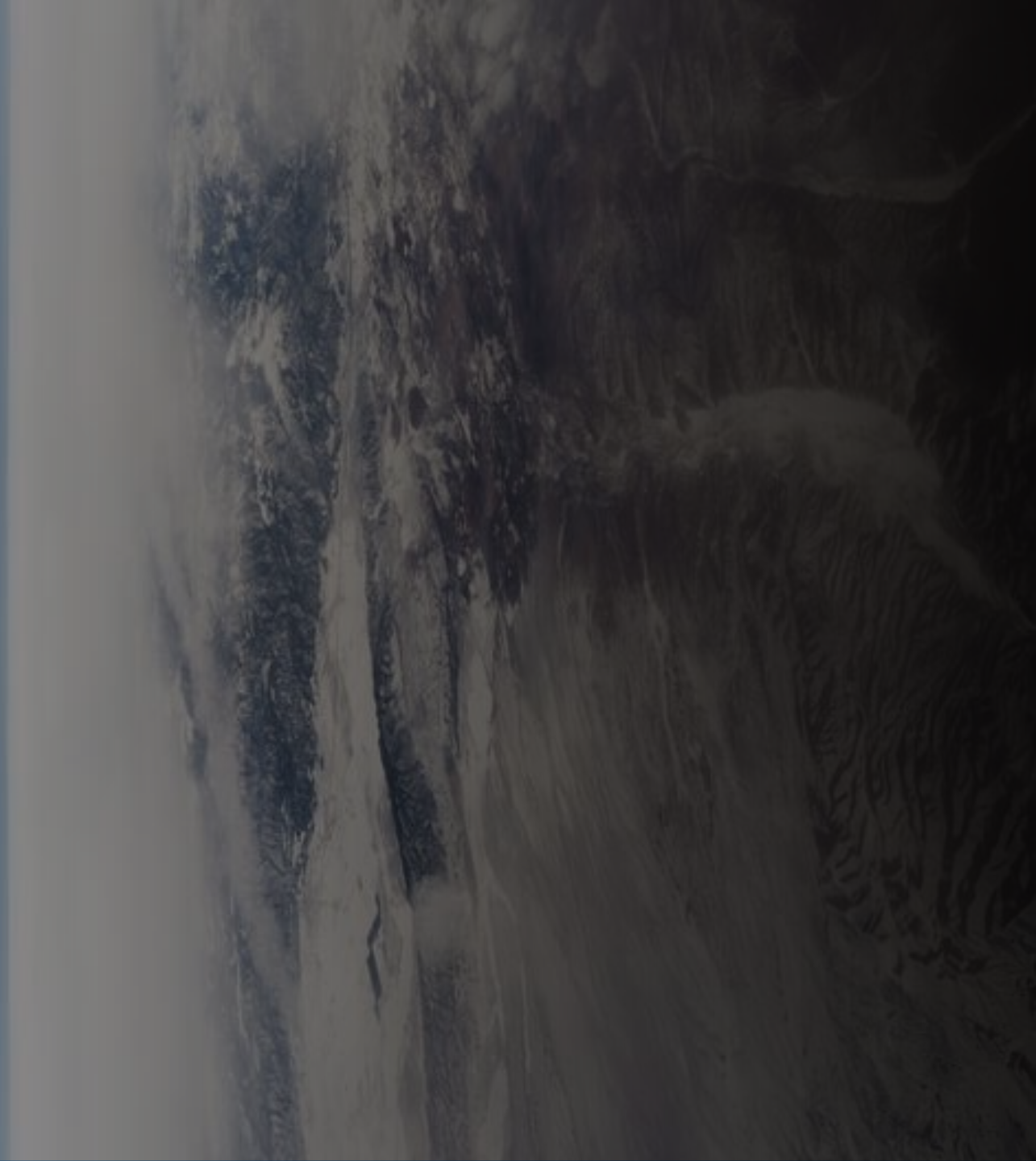
Microsoft Azure

Azure Networking

Marc Dekeyser



Marc Dekeyser – Sr Customer Experience Engineer (CXP)

- Father of 2: Emile (6 years old) and Maeve (4 years old)
- Dog owner (Aussie: moose) and cat servant (Daisy, Missy and Ivar - rescues)
- Since November 2023 owner of a derelict farm with an orchard and a very stubborn blackberry bush
- Belgian, who lives in The Netherlands…

Random things

- Autistic Tinkering Evil Mastermind
- Microsoftie: 2012-2018 & 2022-Present
- Worked all over Europe, USA, Africa, Middle East
- Actually dislikes flying, hates being on a boat/ship/floating contraption.
- Does public speaking as a hobby

Expertise

- Azure Infrastructure
- Azure Containers
- Azure Kubernetes
- Azure OpenAI (Always learning)
- Cloud Identity
- Security
- Automation
- Azure IoT (Always learning)
- Architecture & Design
- Governance
- Cost Management
- Azure Space Stuffs (Always learning)

Dare** to be **Authentic**, **Curious**, and **Passionate

Agenda

- Azure network connectivity
- A walk through the most common Azure Networking architectural patterns.

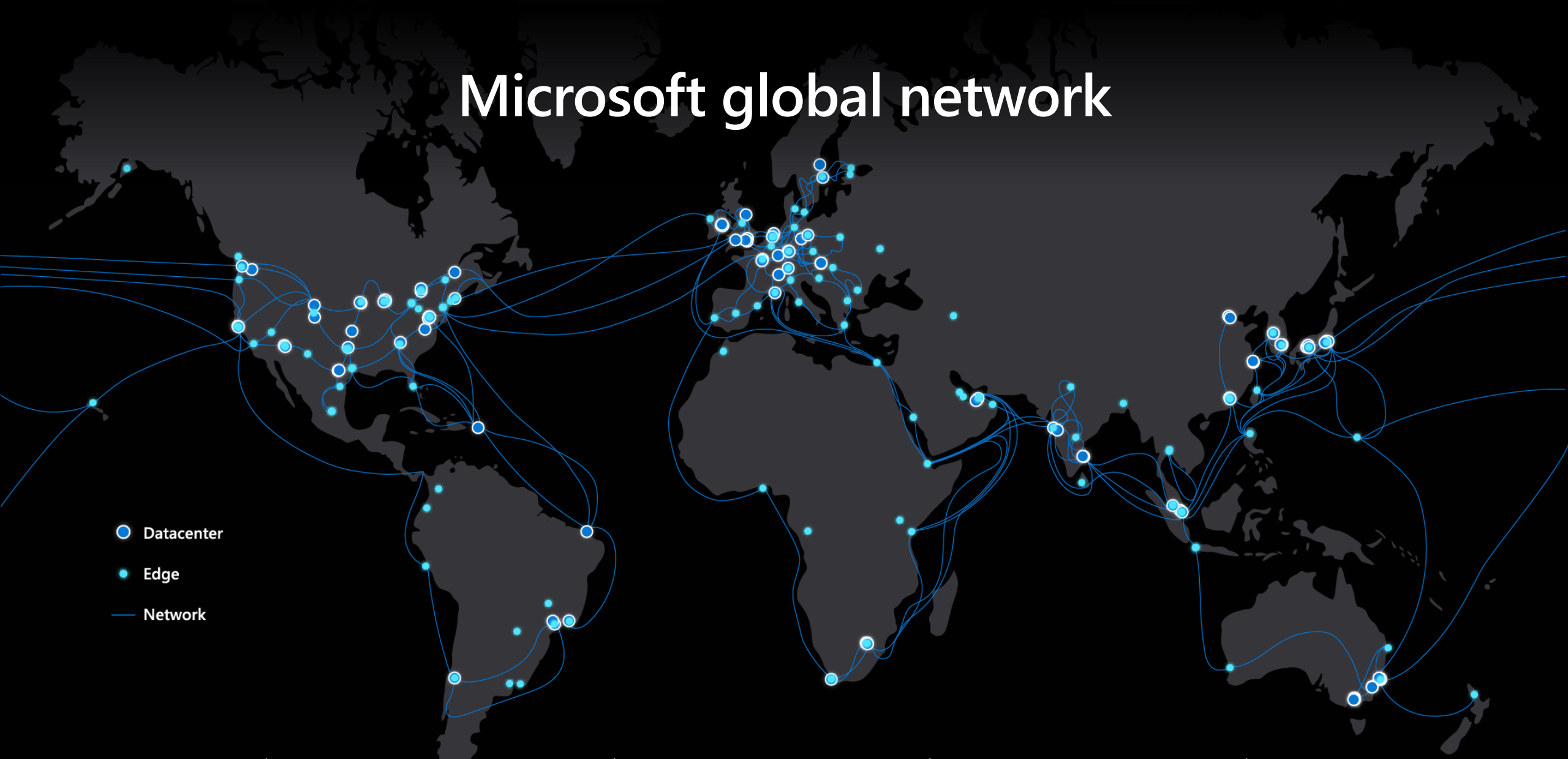
Azure network connectivity

1

Azure Global Infrastructure (Public Cloud)

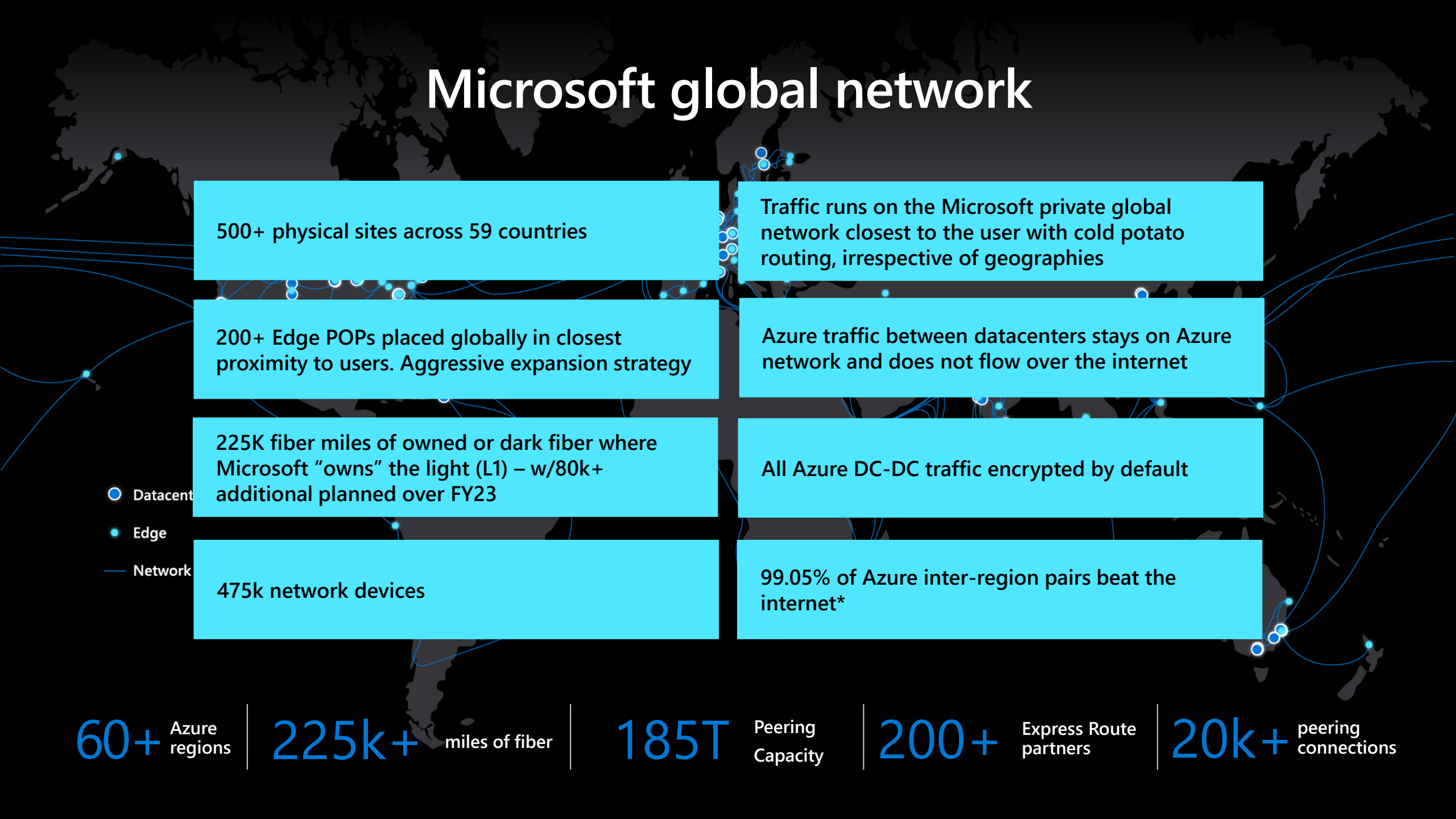
*includes sovereign regions, not viewable on map

Microsoft global network



70 Azure regions | 225k+ miles of fiber | 2Pbps+ WAN Capacity | 200T Peering Capacity | 40k+ Peering Connections

Microsoft global network



500+ physical sites across 59 countries

Traffic runs on the Microsoft private global network closest to the user with cold potato routing, irrespective of geographies

200+ Edge POPs placed globally in closest proximity to users. Aggressive expansion strategy

Azure traffic between datacenters stays on Azure network and does not flow over the internet

225K fiber miles of owned or dark fiber where Microsoft "owns" the light (L1) – w/80k+ additional planned over FY23

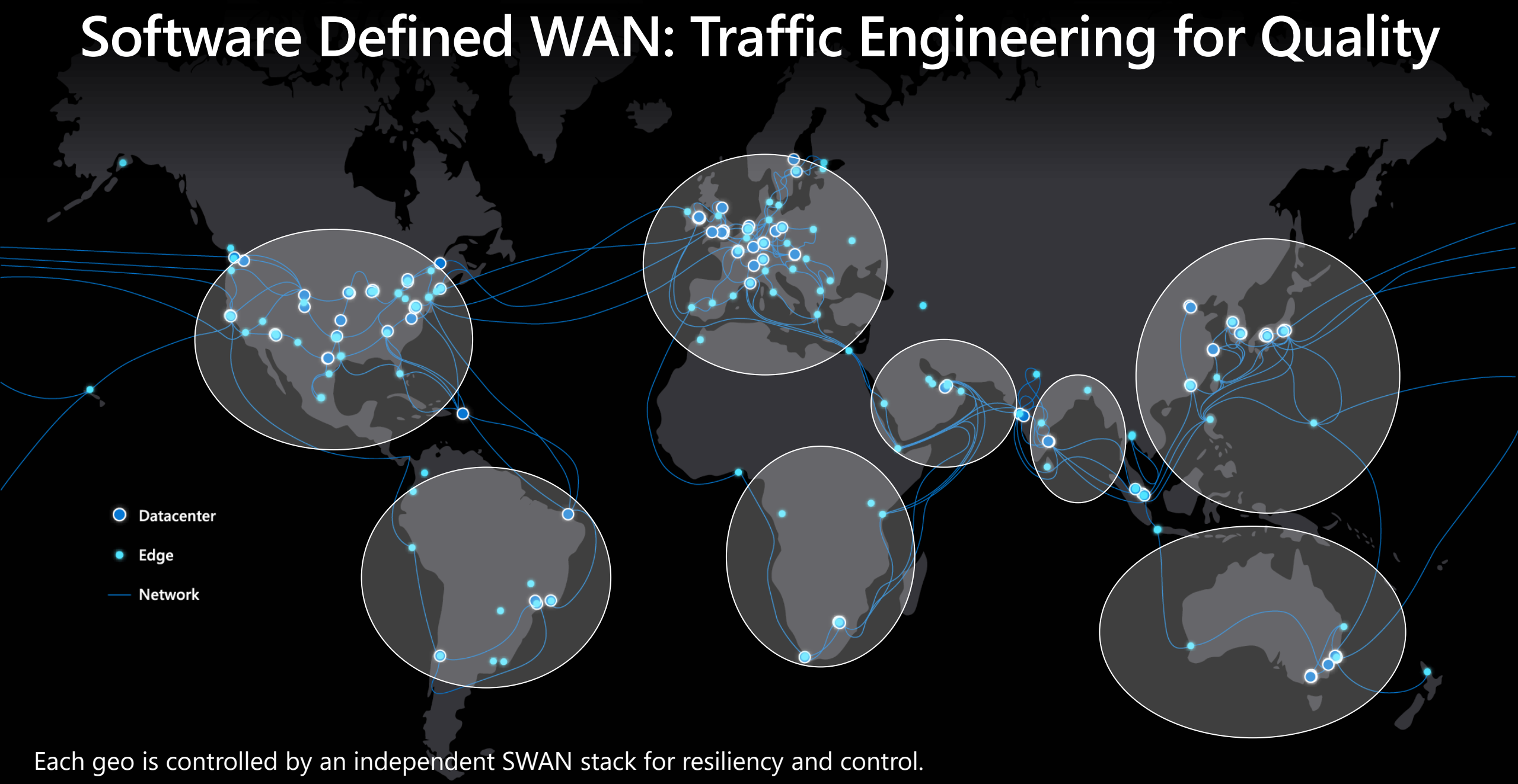
All Azure DC-DC traffic encrypted by default

475k network devices

99.05% of Azure inter-region pairs beat the internet*

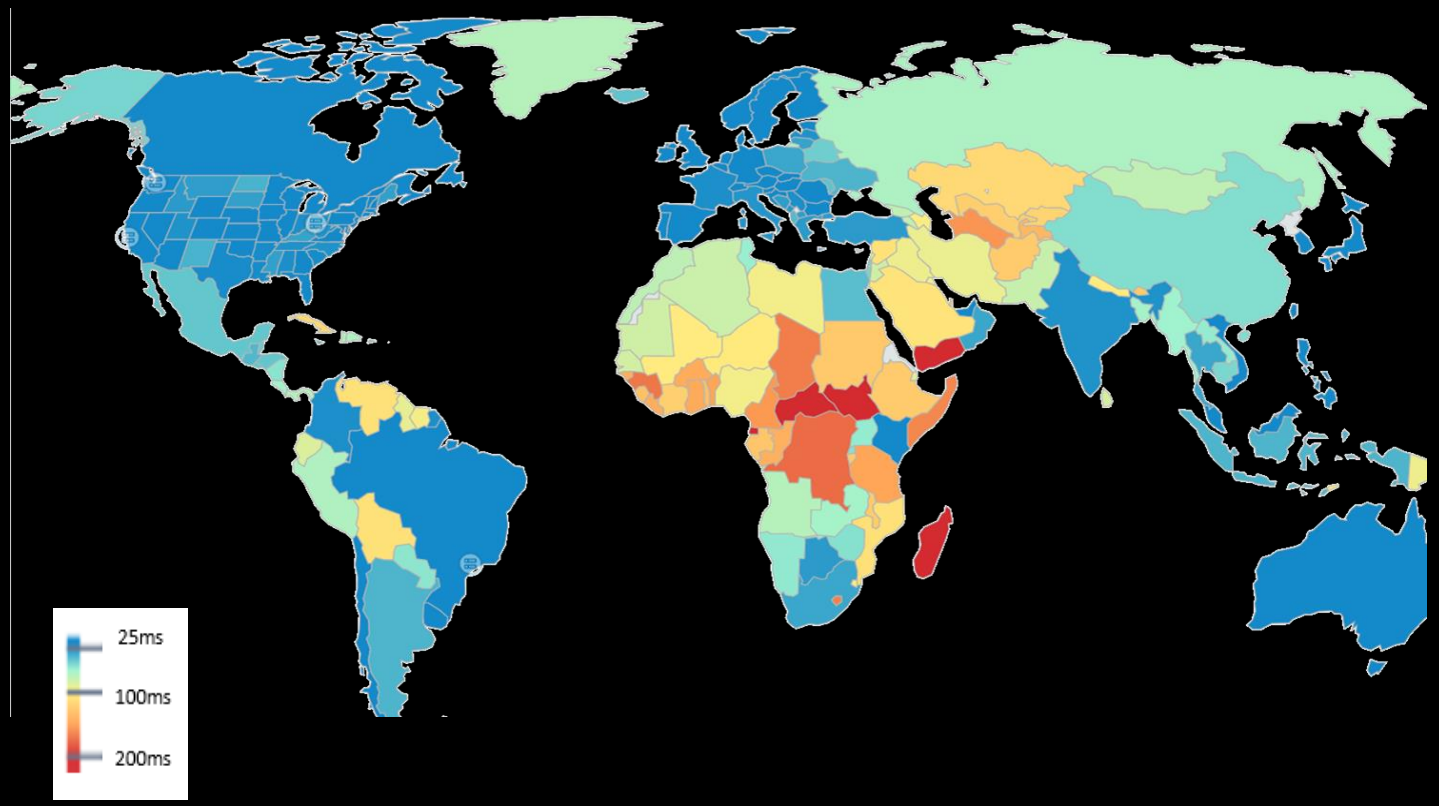
60+ Azure regions | **225k+** miles of fiber | **185T** Peering Capacity | **200+** Express Route partners | **20k+** peering connections

Software Defined WAN: Traffic Engineering for Quality



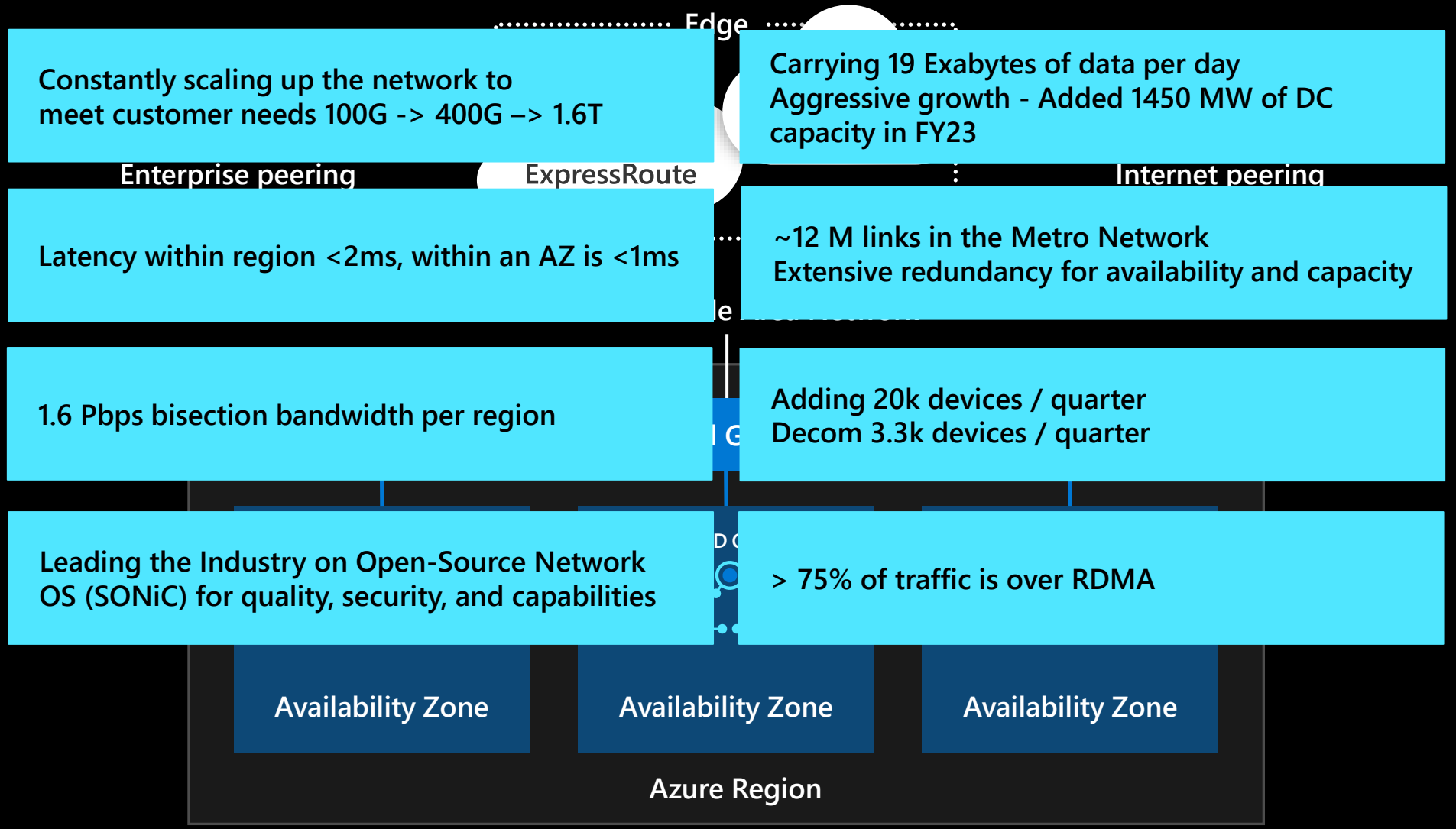
Each geo is controlled by an independent SWAN stack for resiliency and control.

Network Edge PoPs & Internet latency



- 200+ Edge PoPs deployed globally in closest proximity to our customers.
- Cold potato routing and SDN traffic engineering on Edge provides low latency, highly reliable internet connectivity
- Last mile reliability optimization with ISP partnership (MAPS)

Connecting Azure regions to the global network



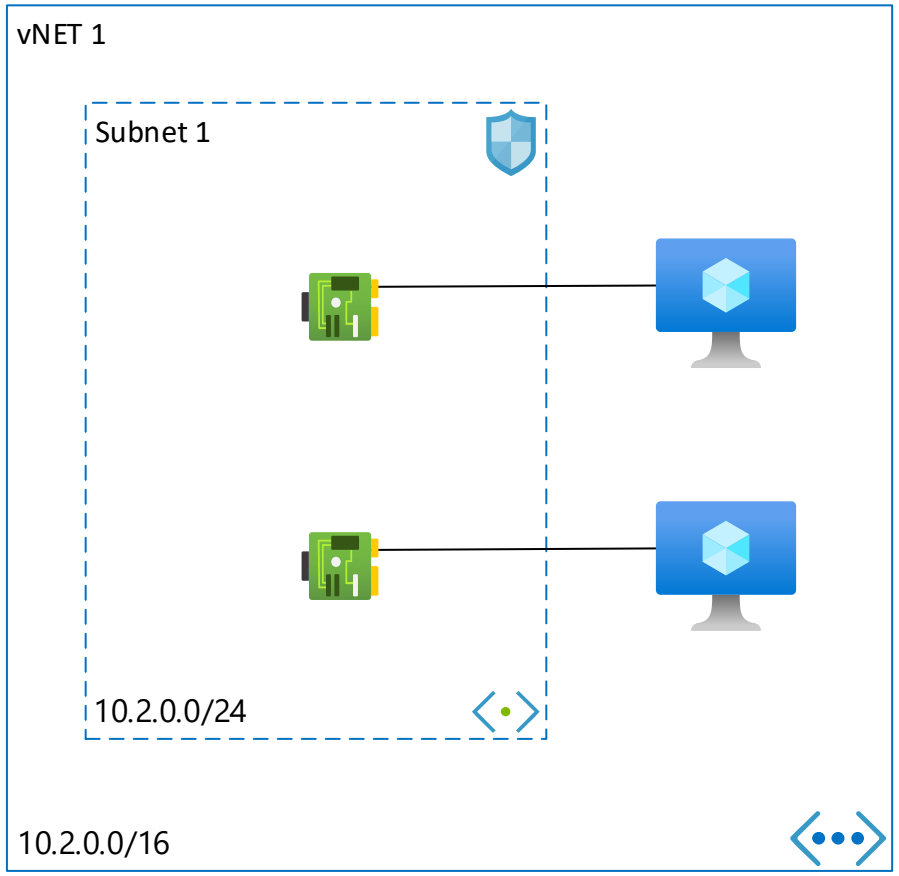
Azure networking patterns

A journey through the common Azure Networking Patterns, from simple to 'OMG WHY'

2

Single vNET - Single subnet

Single vNET – Single Subnet

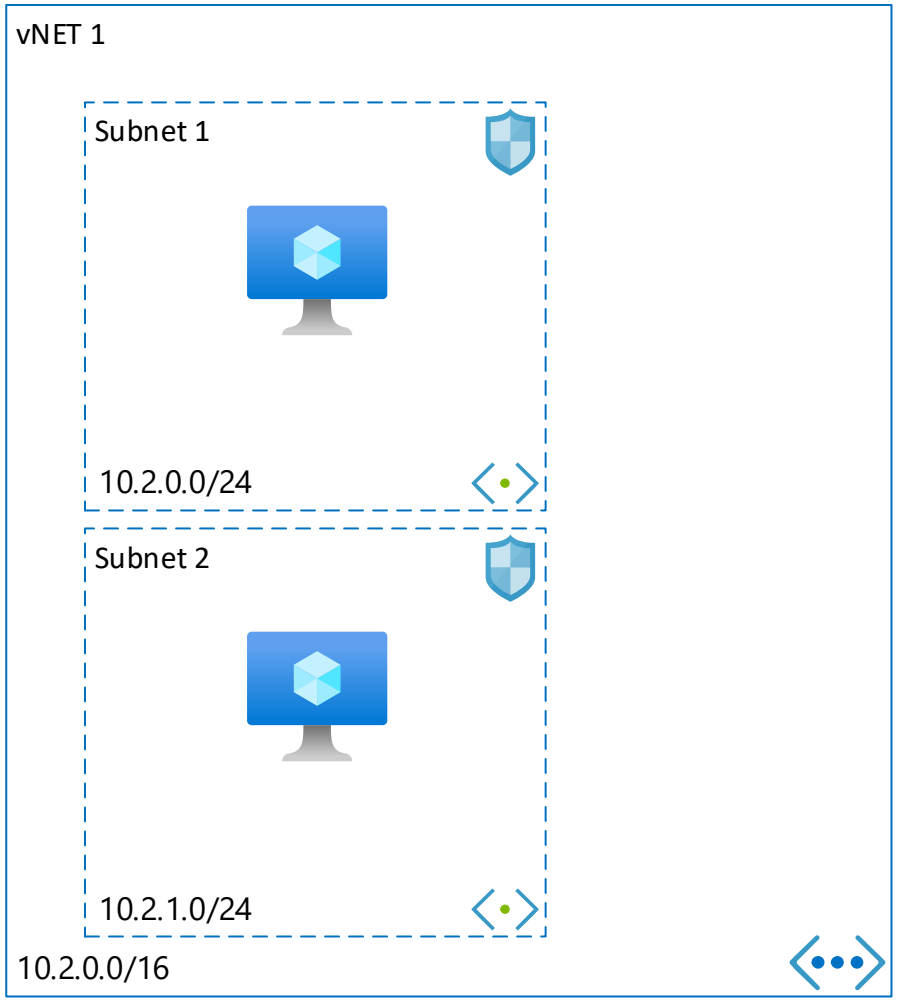


Route Table 1
SYSTEM: 0.0.0.0/0 to Internet
SYSTEM: 10.2.0.0/16 to Virtual Network

- Easy and simple
- NSG for mediation
- Scaling is problematic
- Prone to misconfigurations
- Direct internet access
- No on-premises connectivity

Single vNET - Multiple subnets

Single vNET - Multiple subnets



Uses default system routes

Mediation through NSG

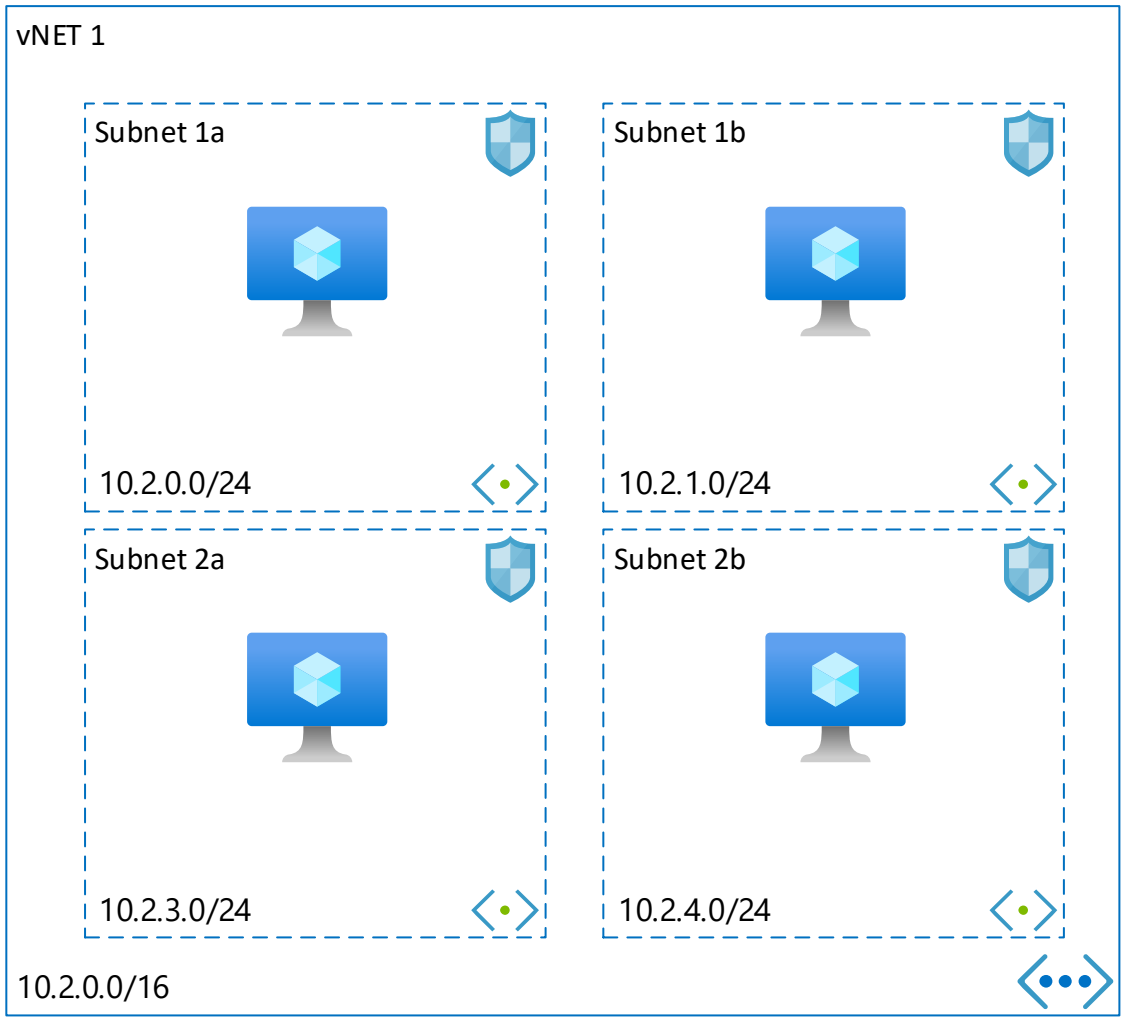
Direct access to the internet

No on-premises connectivity

Route Table 1 – Subnet 1
SYSTEM: 0.0.0.0/0 to Internet
SYSTEM: 10.2.0.0/16 to Virtual Network

Route Table 1 – Subnet 2
SYSTEM: 0.0.0.0/0 to Internet
SYSTEM: 10.2.0.0/16 to Virtual Network

Single vNET - Multiple workloads



Single vNET - Multiple workloads

Uses default system routes

Mediation through NSG

Single blast radius

Direct internet access

No on-premises connectivity

Route Table 1 – Subnet 1a
SYSTEM: 0.0.0.0/0 to Internet
SYSTEM: 10.2.0.0/16 to Virtual Network

Route Table 1 – Subnet 2a
SYSTEM: 0.0.0.0/0 to Internet
SYSTEM: 10.2.0.0/16 to Virtual Network

Route Table 1 – Subnet 1b
SYSTEM: 0.0.0.0/0 to Internet
SYSTEM: 10.2.0.0/16 to Virtual Network

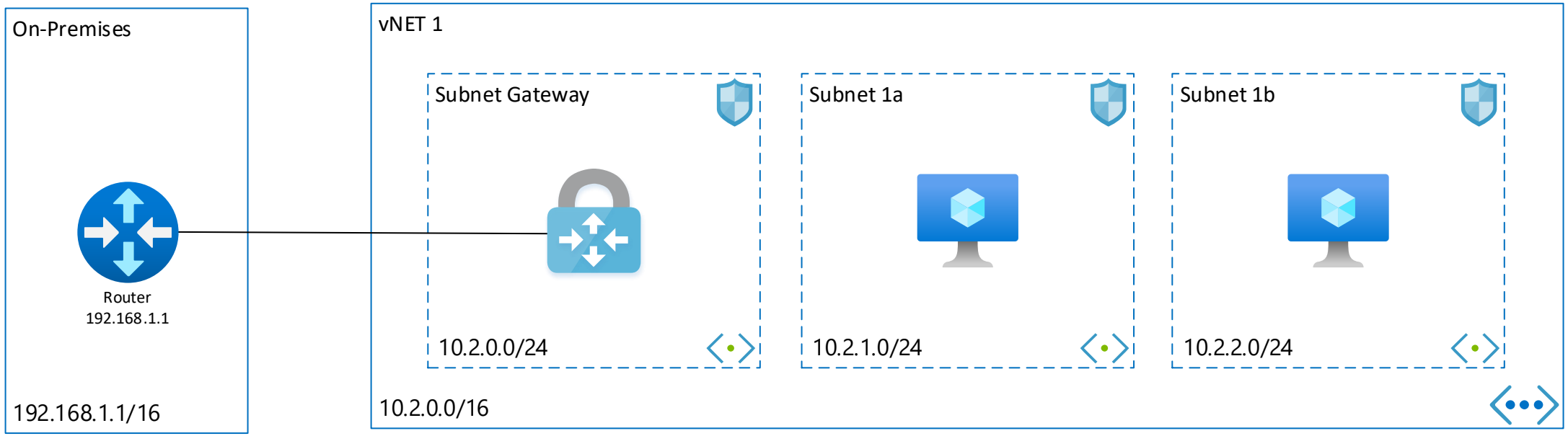
Route Table 1 – Subnet 2b
SYSTEM: 0.0.0.0/0 to Internet
SYSTEM: 10.2.0.0/16 to Virtual Network

Single vNET - On-premises connectivity

Terminology *Intermezzo*

- ExpressRoute
- VPN Gateway
  - P2S
  - S2S

Single vNET - On-premises connectivity



On-Premises
BGP Peer: Azure Virtual Network Gateway
Advertising:
- 192.168.1.0/24
- 192.168.2.0/24
- 192.168.3.0/24
- 192.168.4.0/24

Learned:
10.2.0.0/16

Route Table 1 – Subnet 1a
BGP: 192.168.1.0/24 to Virtual Network Gateway
BGP: 192.168.2.0/24 to Virtual Network Gateway
BGP: 192.168.3.0/24 to Virtual Network Gateway
BGP: 192.168.4.0/24 to Virtual Network Gateway
SYSTEM: 10.2.0.0/16 to Virtual Network
SYSTEM: 0.0.0.0/0 to Internet

Route Table 1 – Subnet Gateway
BGP: 192.168.1.0/24
BGP: 192.168.2.0/24
BGP: 192.168.3.0/24
BGP: 192.168.4.0/24
SYSTEM: 10.2.0.0/16 to Virtual Network

Route Table 1 – Subnet 1b
BGP: 192.168.1.0/24 to Virtual Network Gateway
BGP: 192.168.2.0/24 to Virtual Network Gateway
BGP: 192.168.3.0/24 to Virtual Network Gateway
BGP: 192.168.4.0/24 to Virtual Network Gateway
SYSTEM: 10.2.0.0/16 to Virtual Network
SYSTEM: 0.0.0.0/0 to Internet

Multiple vnets - On-premises connectivity

Terminology *Intermezzo*

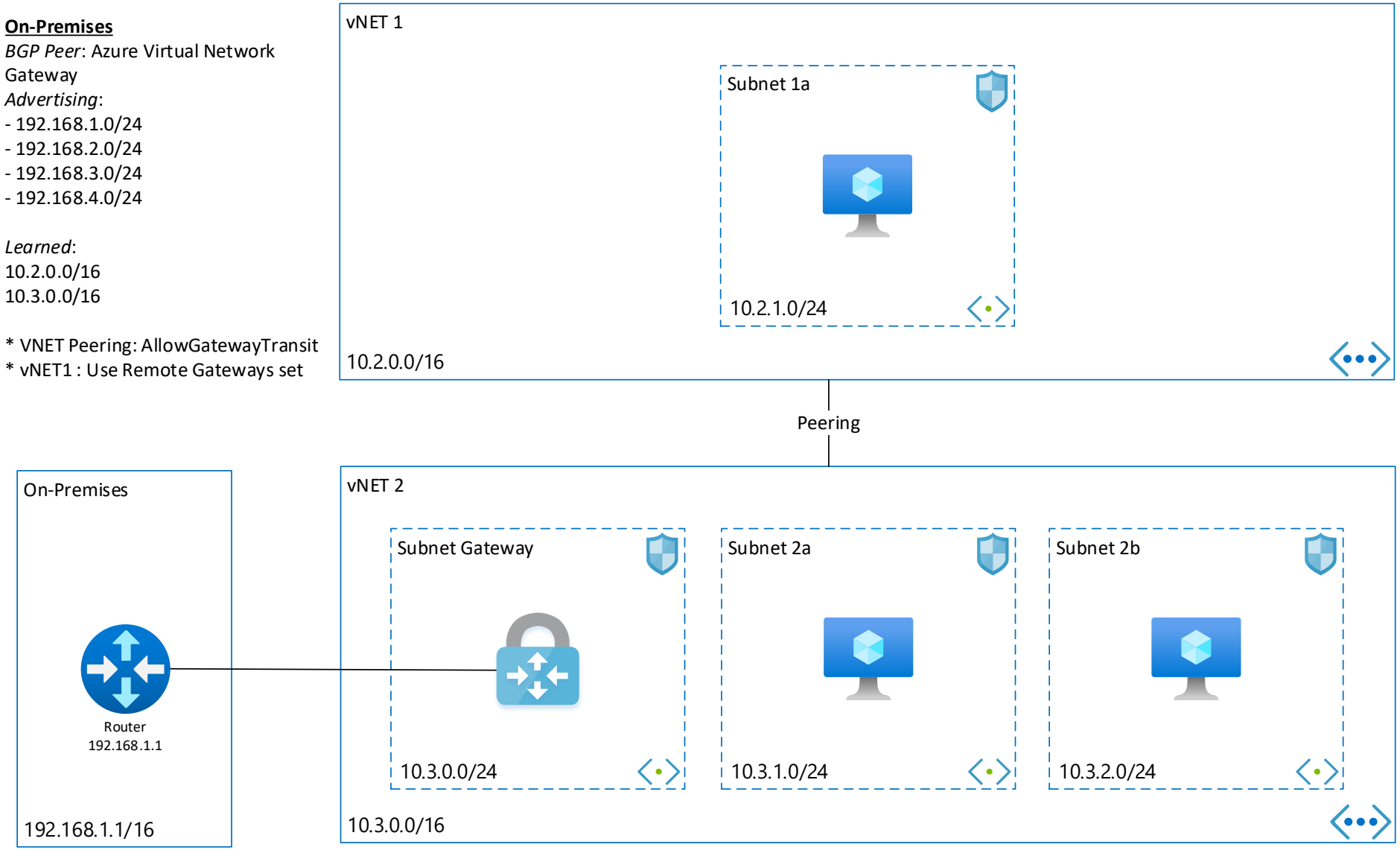
- vNET Peering

Multiple vnets - On-premises connectivity

On-Premises
BGP Peer: Azure Virtual Network Gateway
Advertising:
- 192.168.1.0/24
- 192.168.2.0/24
- 192.168.3.0/24
- 192.168.4.0/24

Learned:
10.2.0.0/16
10.3.0.0/16

* VNET Peering: AllowGatewayTransit
* vNET1 : Use Remote Gateways set



Route Table vNET1 – Subnet 1a
BGP: 192.168.1.0/24 to Virtual Network Gateway
BGP: 192.168.2.0/24 to Virtual Network Gateway
BGP: 192.168.3.0/24 to Virtual Network Gateway
BGP: 192.168.4.0/24 to Virtual Network Gateway
SYSTEM: 10.3.0.0/16 to vNET Peering
SYSTEM: 10.2.0.0/16 to Virtual Network
SYSTEM: 0.0.0.0/0 to Internet

Route Table vNET2 – Subnet Gateway
BGP: 192.168.1.0/24
BGP: 192.168.2.0/24
BGP: 192.168.3.0/24
BGP: 192.168.4.0/24
SYSTEM: 10.2.0.0/16 to vNET Peering
SYSTEM: 10.3.0.0/16 to Virtual Network

Route Table vNET2 – Subnet 2a
BGP: 192.168.1.0/24 to Virtual Network Gateway
BGP: 192.168.2.0/24 to Virtual Network Gateway
BGP: 192.168.3.0/24 to Virtual Network Gateway
BGP: 192.168.4.0/24 to Virtual Network Gateway
SYSTEM: 10.2.0.0/16 to Virtual Network
SYSTEM: 10.3.0.0/16 to Virtual Network
SYSTEM: 0.0.0.0/0 to Internet

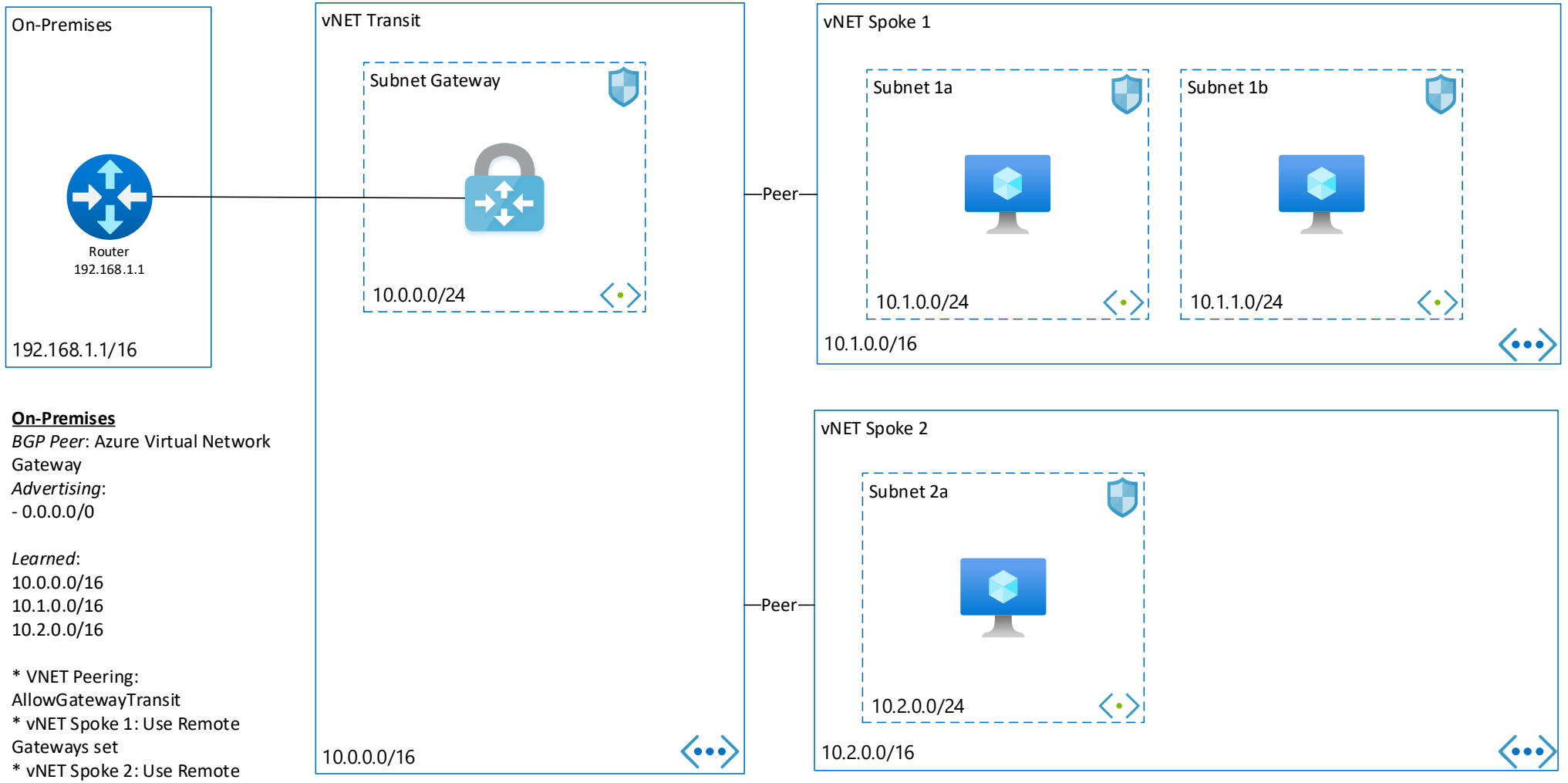
Route Table vNET 2 – Subnet 2b
BGP: 192.168.1.0/24 to Virtual Network Gateway
BGP: 192.168.2.0/24 to Virtual Network Gateway
BGP: 192.168.3.0/24 to Virtual Network Gateway
BGP: 192.168.4.0/24 to Virtual Network Gateway
SYSTEM: 10.2.0.0/16 to Virtual Network
SYSTEM: 10.3.0.0/16 to Virtual Network
SYSTEM: 0.0.0.0/0 to Internet

Hub/Spoke - Flat network with forced tunneling

Terminology *Intermezzo*

- Forced Tunneling

Hub/Spoke - Flat network with forced tunneling



On-Premises
BGP Peer: Azure Virtual Network Gateway
Advertising:
- 0.0.0.0/0

Learned:
10.0.0.0/16
10.1.0.0/16
10.2.0.0/16

* VNET Peering: AllowGatewayTransit
* vNET Spoke 1: Use Remote Gateways set
* vNET Spoke 2: Use Remote Gateways set

Route Table vNET Transit
BGP: 0.0.0.0/0
SYSTEM: 10.2.0.0/16 to vNET Peering
SYSTEM: 10.3.0.0/16 to Virtual Network

Route Table vNET Spoke 1 – Subnet 1a
BGP: 0.0.0.0/0 to Virtual Network Gateway
SYSTEM: 10.0.0.0/16 to vNET Peering
SYSTEM: 10.1.0.0/16 to Virtual Network

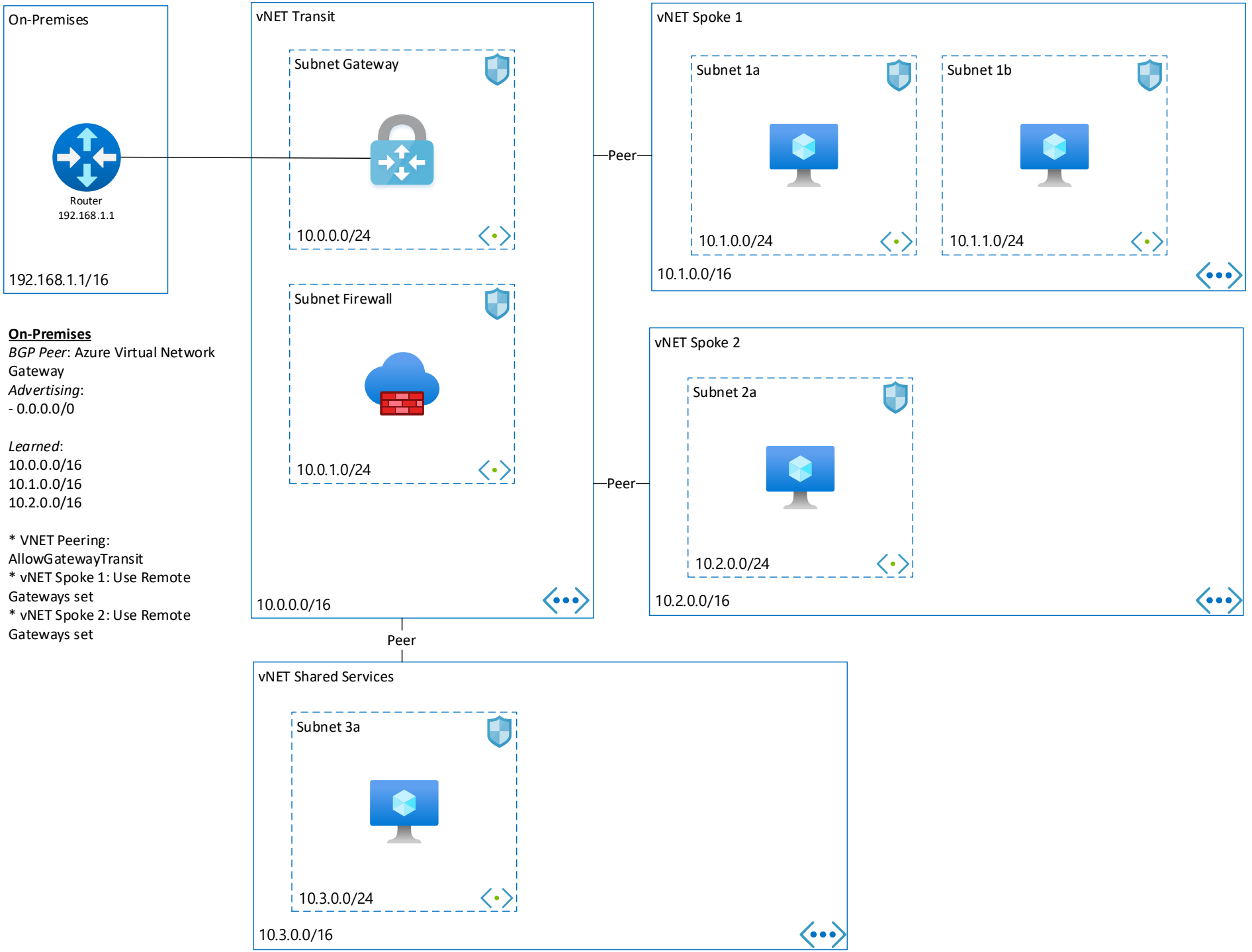
Route Table vNET Spoke 1 – Subnet 1b
BGP: 0.0.0.0/0 to Virtual Network Gateway
SYSTEM: 10.0.0.0/16 to vNET Peering
SYSTEM: 10.1.0.0/16 to Virtual Network

Route Table vNET Spoke 2 – Subnet 2a
BGP: 0.0.0.0/0 to Virtual Network Gateway
SYSTEM: 10.0.0.0/16 to vNET Peering
SYSTEM: 10.2.0.0/16 to Virtual Network

Hub/Spoke – East/West firewall with forced tunneling

Terminology *Intermezzo*

- East/West Network Traffic
- Shared Services



On-Premises
BGP Peer: Azure Virtual Network Gateway
Advertising:
- 0.0.0.0/0

Learned:
10.0.0.0/16
10.1.0.0/16
10.2.0.0/16

* VNET Peering: AllowGatewayTransit
* vNET Spoke 1: Use Remote Gateways set
* vNET Spoke 2: Use Remote Gateways set

Route Table vNET Transit – Subnet Gateway
UDR: 10.1.0.0./16 To Firewall ILB IP
UDR: 10.2.0.0./16 To Firewall ILB IP
UDR: 10.3.0.0./16 To Firewall ILB IP
BGP: 0.0.0.0/0
SYSTEM: 10.0.0.0/16 to Virtual Network
INVALID SYSTEM: 10.1.0.0/16 to Virtual Network
INVALID SYSTEM: 10.2.0.0/16 to Virtual Network
INVALID SYSTEM: 10.3.0.0/16 to Virtual Network

Route Table vNET Transit – Subnet Firewall
BGP: 0.0.0.0/0 to Virtual Network Gateway
SYSTEM: 10.0.0.0/16 to Virtual Network
SYSTEM: 10.1.0.0/16 to vNET Peering
SYSTEM: 10.2.0.0/16 to vNET Peering
SYSTEM: 10.3.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/0 to Internet

Route Table vNET Shared Services – Subnet 3a
UDR: 0.0.0.0/0 to Firewall ILB IP
SYSTEM: 10.3.0.0/16 to Virtual Network
SYSTEM: 10.0.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/0 to Internet

*** BGP Propogation Disabled**

Route Table vNET Spoke 1 – Subnet 1a
UDR: 0.0.0.0/0 to Firewall ILB IP
SYSTEM: 10.1.0.0/16 to Virtual Network
SYSTEM: 10.0.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/0 to Internet

*** BGP Propogation Disabled**

Route Table vNET Spoke 1 – Subnet 1b
UDR: 0.0.0.0/0 to Firewall ILB IP
SYSTEM: 10.1.0.0/16 to Virtual Network
SYSTEM: 10.0.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/16 to Internet

*** BGP Propogation Disabled**

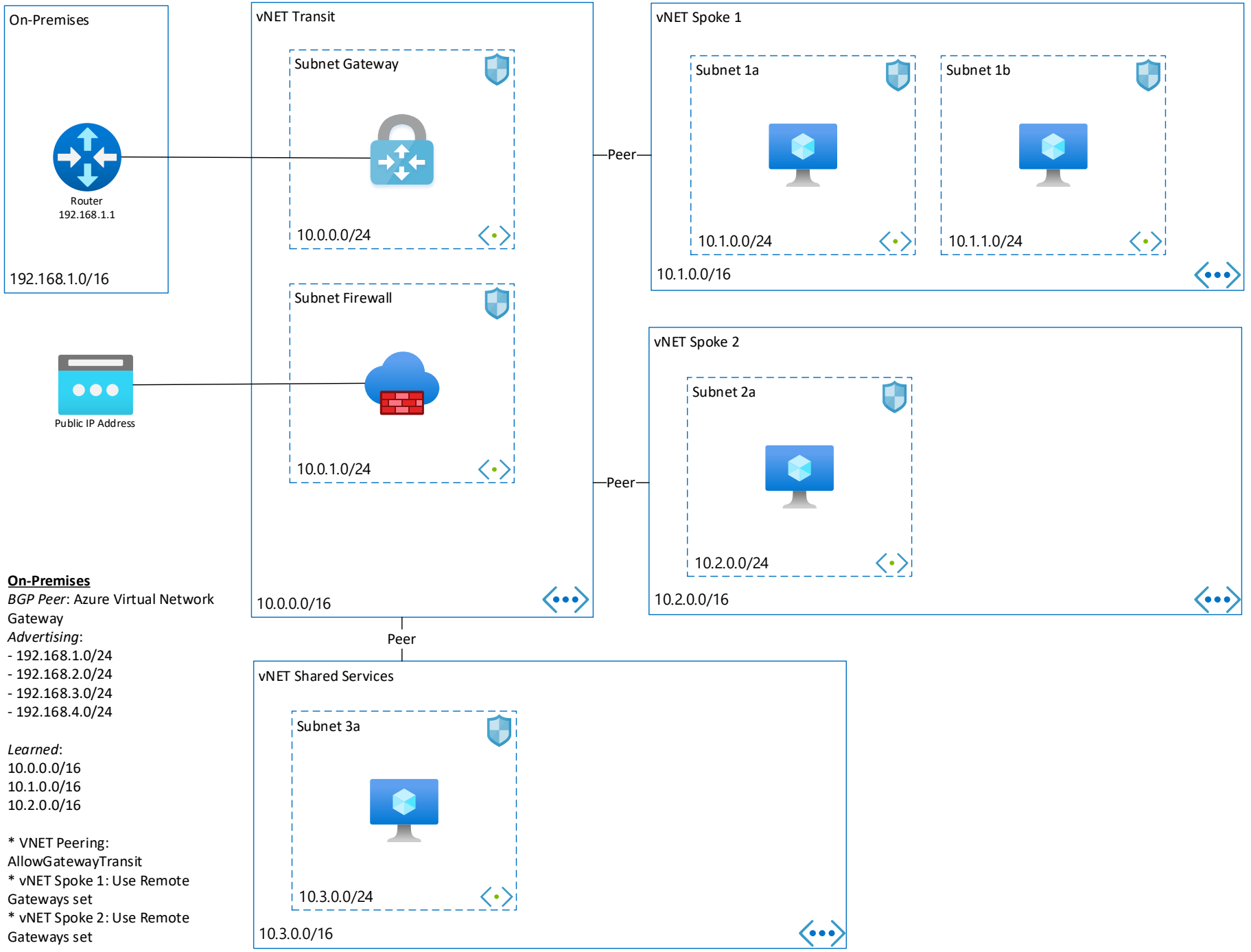
Route Table vNET Spoke 2 – Subnet 2a
UDR: 0.0.0.0/0 to Firewall ILB IP
SYSTEM: 10.3.0.0/16 to Virtual Network
SYSTEM: 10.0.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/16 to Internet

*** BGP Propogation Disabled**

Hub/spoke - Single firewall for North/South and East/West

Terminology *Intermezzo*

- North/South Traffic



On-Premises
BGP Peer: Azure Virtual Network Gateway
Advertising:
- 192.168.1.0/24
- 192.168.2.0/24
- 192.168.3.0/24
- 192.168.4.0/24

Learned:
10.0.0.0/16
10.1.0.0/16
10.2.0.0/16

* VNET Peering: AllowGatewayTransit
* vNET Spoke 1: Use Remote Gateways set
* vNET Spoke 2: Use Remote Gateways set

Route Table vNET Transit – Subnet Gateway
UDR: 10.1.0.0/16 To Firewall ILB IP
UDR: 10.2.0.0/16 To Firewall ILB IP
UDR: 10.3.0.0/16 To Firewall ILB IP
BGP: 192.168.1.0/24 to virtual Network Gateway
BGP: 192.168.2.0/24 to virtual Network Gateway
BGP: 192.168.3.0/24 to virtual Network Gateway
BGP: 192.168.4.0/24 to virtual Network Gateway
SYSTEM: 10.0.0.0/16 to Virtual Network
INVALID SYSTEM: 10.1.0.0/16 to Virtual Network
INVALID SYSTEM: 10.2.0.0/16 to Virtual Network
INVALID SYSTEM: 10.3.0.0/16 to Virtual Network

Route Table vNET Transit – Subnet Firewall
BGP: 192.168.1.0/24 to virtual Network Gateway
BGP: 192.168.2.0/24 to virtual Network Gateway
BGP: 192.168.3.0/24 to virtual Network Gateway
BGP: 192.168.4.0/24 to virtual Network Gateway
SYSTEM: 10.0.0.0/16 to Virtual Network
SYSTEM: 10.1.0.0/16 to vNET Peering
SYSTEM: 10.2.0.0/16 to vNET Peering
SYSTEM: 10.3.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/0 to Internet

Route Table vNET Shared Services – Subnet 3a
UDR: 0.0.0.0/0 to Firewall ILB IP
SYSTEM: 10.3.0.0/16 to Virtual Network
SYSTEM: 10.0.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/0 to Internet

*** BGP Propogation Disabled**

Route Table vNET Spoke 1 – Subnet 1a
UDR: 0.0.0.0/0 to Firewall ILB IP
SYSTEM: 10.1.0.0/16 to Virtual Network
SYSTEM: 10.0.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/0 to Internet

*** BGP Propogation Disabled**

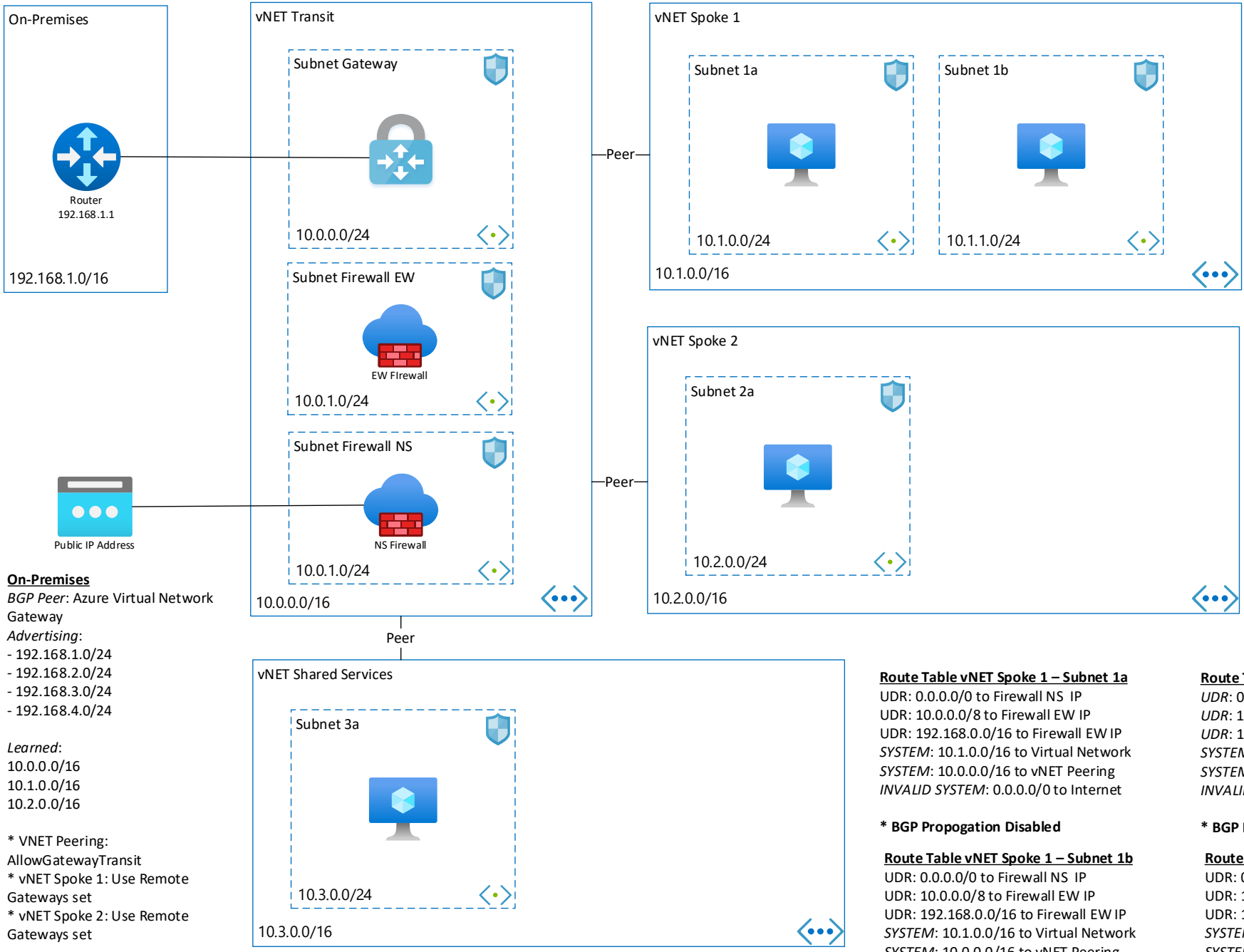
Route Table vNET Spoke 1 – Subnet 1b
UDR: 0.0.0.0/0 to Firewall ILB IP
SYSTEM: 10.1.0.0/16 to Virtual Network
SYSTEM: 10.0.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/16 to Internet

*** BGP Propogation Disabled**

Route Table vNET Spoke 2 – Subnet 2a
UDR: 0.0.0.0/0 to Firewall ILB IP
SYSTEM: 10.3.0.0/16 to Virtual Network
SYSTEM: 10.0.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/16 to Internet

*** BGP Propogation Disabled**

Hub/spoke - Dedicated north/south firewall and dedicated east/west firewall



Route Table vNET Transit – Subnet Gateway
UDR: 10.1.0.0./16 To Firewall EW IP
UDR: 10.2.0.0./16 To Firewall EW IP
UDR: 10.3.0.0./16 To Firewall EW IP
BGP: 192.168.1.0/24 to virtual Network Gateway
BGP: 192.168.2.0/24 to virtual Network Gateway
BGP: 192.168.3.0/24 to virtual Network Gateway
BGP: 192.168.4.0/24 to virtual Network Gateway
SYSTEM: 10.0.0.0/16 to Virtual Network
INVALID SYSTEM: 10.1.0.0/16 to Peering
INVALID SYSTEM: 10.2.0.0/16 to Peering
INVALID SYSTEM: 10.3.0.0/16 to Peering

Route Table vNET Transit – Subnet Firewall EW
BGP: 192.168.1.0/24 to virtual Network Gateway
BGP: 192.168.2.0/24 to virtual Network Gateway
BGP: 192.168.3.0/24 to virtual Network Gateway
BGP: 192.168.4.0/24 to virtual Network Gateway
SYSTEM: 10.0.0.0/16 to Virtual Network
SYSTEM: 10.1.0.0/16 to vNET Peering
SYSTEM: 10.2.0.0/16 to vNET Peering
SYSTEM: 10.3.0.0/16 to vNET Peering
BGP: 0.0.0.0/0 to NS Firewall IP
INVALID SYSTEM: 0.0.0.0/0 to Internet

Route Table vNET Transit – Subnet Firewall NS
SYSTEM: 10.0.0.0/16 to Virtual Network
SYSTEM: 10.1.0.0/16 to vNET Peering
SYSTEM: 10.2.0.0/16 to vNET Peering
SYSTEM: 10.3.0.0/16 to vNET Peering
UDR: 0.0.0.0/0 to NS Firewall IP
INVALID SYSTEM: 0.0.0.0/0 to Internet

On-Premises
BGP Peer: Azure Virtual Network Gateway
Advertising:
- 192.168.1.0/24
- 192.168.2.0/24
- 192.168.3.0/24
- 192.168.4.0/24

Learned:
10.0.0.0/16
10.1.0.0/16
10.2.0.0/16

* VNET Peering: AllowGatewayTransit
* vNET Spoke 1: Use Remote Gateways set
* vNET Spoke 2: Use Remote Gateways set

Route Table vNET Spoke 1 – Subnet 1a
UDR: 0.0.0.0/0 to Firewall NS IP
UDR: 10.0.0.0/8 to Firewall EW IP
UDR: 192.168.0.0/16 to Firewall EW IP
SYSTEM: 10.1.0.0/16 to Virtual Network
SYSTEM: 10.0.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/0 to Internet

*** BGP Propogation Disabled**

Route Table vNET Spoke 1 – Subnet 1b
UDR: 0.0.0.0/0 to Firewall NS IP
UDR: 10.0.0.0/8 to Firewall EW IP
UDR: 192.168.0.0/16 to Firewall EW IP
SYSTEM: 10.1.0.0/16 to Virtual Network
SYSTEM: 10.0.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/16 to Internet

*** BGP Propogation Disabled**

Route Table vNET Shared Services – Subnet 3a
UDR: 0.0.0.0/0 to Firewall NS IP
UDR: 10.0.0.0/8 to Firewall EW IP
UDR: 192.168.0.0/16 to Firewall EW IP
SYSTEM: 10.3.0.0/16 to Virtual Network
SYSTEM: 10.0.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/0 to Internet

*** BGP Propogation Disabled**

Route Table vNET Spoke 2 – Subnet 2a
UDR: 0.0.0.0/0 to Firewall NS IP
UDR: 10.0.0.0/8 to Firewall EW IP
UDR: 192.168.0.0/16 to Firewall EW IP
SYSTEM: 10.3.0.0/16 to Virtual Network
SYSTEM: 10.0.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/16 to Internet

*** BGP Propogation Disabled**

Hub/spoke - Dedicated north/south firewall, dedicated east/west firewall, separate vNETs

On-Premises
BGP Peer: Azure Virtual Network Gateway
Advertising:
- 192.168.1.0/24
- 192.168.2.0/24
- 192.168.3.0/24
- 192.168.4.0/24

Learned:
10.0.0.0/16
10.1.0.0/16
10.2.0.0/16

* VNET Peering: AllowGatewayTransit
* vNET Spoke 1: Use Remote Gateways set
* vNET Spoke 2: Use Remote Gateways set

Route Table vNET Transit – Subnet Gateway
UDR: 10.1.0.0./16 To Firewall EW IP
UDR: 10.2.0.0./16 To Firewall EW IP
UDR: 10.3.0.0./16 To Firewall EW IP
BGP: 192.168.1.0/24 to virtual Network Gateway
BGP: 192.168.2.0/24 to virtual Network Gateway
BGP: 192.168.3.0/24 to virtual Network Gateway
BGP: 192.168.4.0/24 to virtual Network Gateway
SYSTEM: 10.0.0.0/16 to Virtual Network
INVALID SYSTEM: 10.1.0.0/16 to Peering
INVALID SYSTEM: 10.2.0.0/16 to Peering
INVALID SYSTEM: 10.3.0.0/16 to Peering

Route Table vNET Transit – Subnet Firewall EW
BGP: 192.168.1.0/24 to virtual Network Gateway
BGP: 192.168.2.0/24 to virtual Network Gateway
BGP: 192.168.3.0/24 to virtual Network Gateway
BGP: 192.168.4.0/24 to virtual Network Gateway
SYSTEM: 10.0.0.0/16 to Virtual Network
SYSTEM: 10.1.0.0/16 to vNET Peering
SYSTEM: 10.2.0.0/16 to vNET Peering
SYSTEM: 10.3.0.0/16 to vNET Peering
BGP: 0.0.0.0/0 to none
INVALID SYSTEM: 0.0.0.0/0 to Internet

Route Table vNET Spoke 1 – Subnet 1a
UDR: 0.0.0.0/0 to Firewall NS IP
UDR: 10.0.0.0/8 to Firewall EW IP
UDR: 192.168.0.0/16 to Firewall EW IP
SYSTEM: 10.1.0.0/16 to Virtual Network
SYSTEM: 10.0.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/0 to Internet

*** BGP Propogation Disabled**

Route Table vNET Spoke 1 – Subnet 1b
UDR: 0.0.0.0/0 to Firewall NS IP
UDR: 10.0.0.0/8 to Firewall EW IP
UDR: 192.168.0.0/16 to Firewall EW IP
SYSTEM: 10.1.0.0/16 to Virtual Network
SYSTEM: 10.0.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/16 to Internet

*** BGP Propogation Disabled**

Route Table vNET Spoke 2 – Subnet 2a
UDR: 0.0.0.0/0 to Firewall NS IP
UDR: 10.0.0.0/8 to Firewall EW IP
UDR: 192.168.0.0/16 to Firewall EW IP
SYSTEM: 10.3.0.0/16 to Virtual Network
SYSTEM: 10.0.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/16 to Internet

*** BGP Propogation Disabled**

Route Table vNET Transit – Subnet Firewall NS
SYSTEM: 10.0.0.0/16 to Virtual Network
SYSTEM: 10.1.0.0/16 to vNET Peering
SYSTEM: 10.2.0.0/16 to vNET Peering
SYSTEM: 10.3.0.0/16 to vNET Peering
SYSTEM: 0.0.0.0/0 to Internet

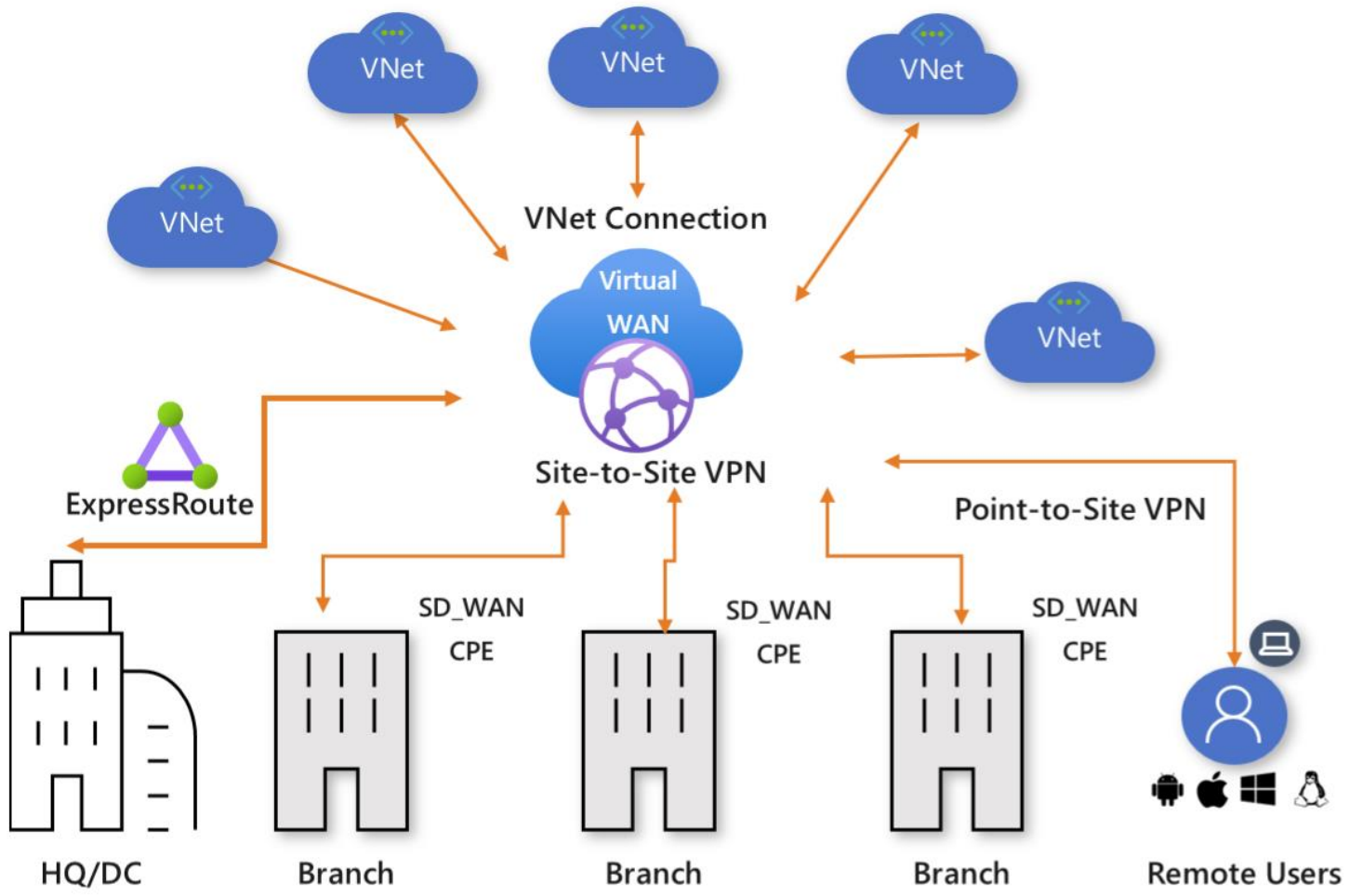
Route Table vNET Shared Services – Subnet 3a
UDR: 0.0.0.0/0 to Firewall NS IP
UDR: 10.0.0.0/8 to Firewall EW IP
UDR: 192.168.0.0/16 to Firewall EW IP
SYSTEM: 10.3.0.0/16 to Virtual Network
SYSTEM: 10.0.0.0/16 to vNET Peering
INVALID SYSTEM: 0.0.0.0/0 to Internet

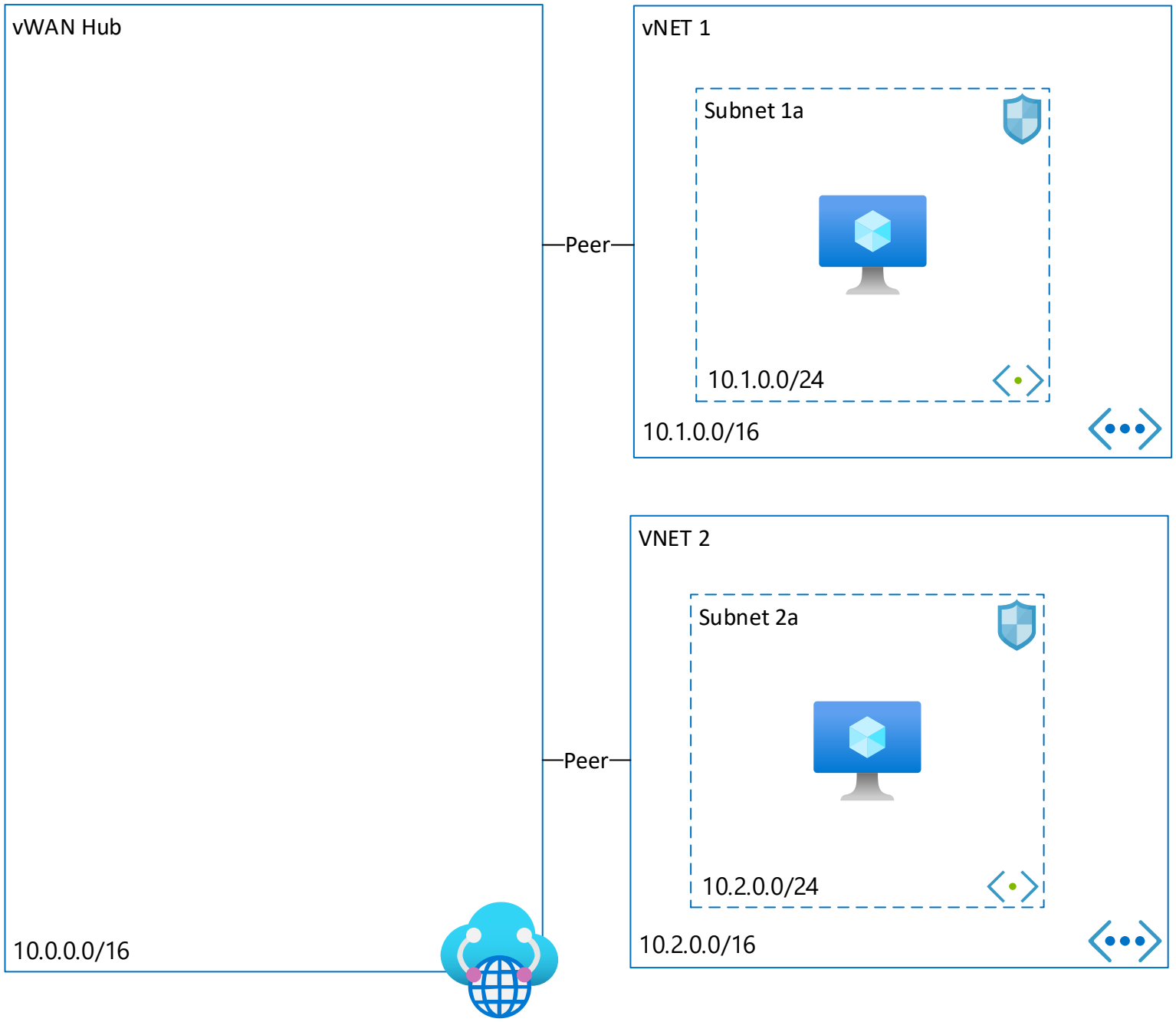
*** BGP Propogation Disabled**

vWAN - Single region vWAN Hub

Terminology *Intermezzo*

- vWAN





vWAN Settings
Branch-to-Branch: Enabled

Route Table vNET 1
BGP: 10.2.0.0/16 to Virtual Network Gateway
System: 10.0.0.0/16 to vNET Peering
System: 10.1.0.0/16 to Virtual Network

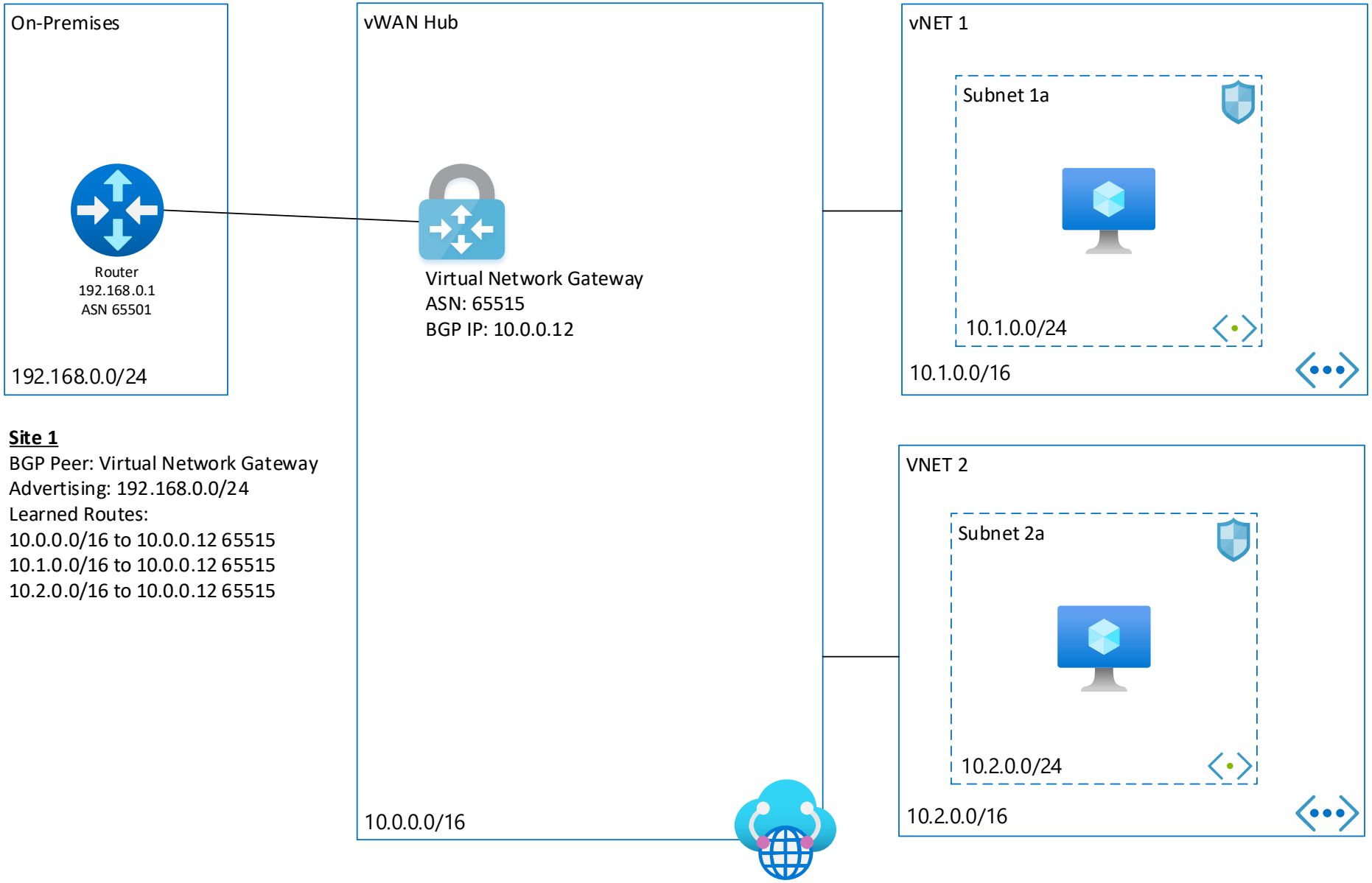
Route Table vNET 2
BGP: 10.1.0.0/16 to Virtual Network Gateway
System: 10.0.0.0/16 to vNET Peering
System: 10.2.0.0/16 to Virtual Network

Region 1 – VNET1 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 1 – VNET2 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 1 – Default Route Table
Labels: Default
Static Routes:
Effective Routes:
10.1.0.0/16 to Virtual Network Connection
10.2.0.0/16 to Virtual Network Connection

vWAN - Single region hub with single branch



Site 1
BGP Peer: Virtual Network Gateway
Advertising: 192.168.0.0/24
Learned Routes:
10.0.0.0/16 to 10.0.0.12 65515
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515

vWAN Settings
Branch-to-Branch: Enabled

Route Table vNET 1
BGP: 10.2.0.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/24 to Virtual Network Gateway
System: 10.0.0.0/16 to vNET Peering
System: 10.1.0.0/16 to Virtual Network

Route Table vNET 2
BGP: 10.1.0.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/24 to Virtual Network Gateway
System: 10.0.0.0/16 to vNET Peering
System: 10.2.0.0/16 to Virtual Network

Region 1 – VNET1 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

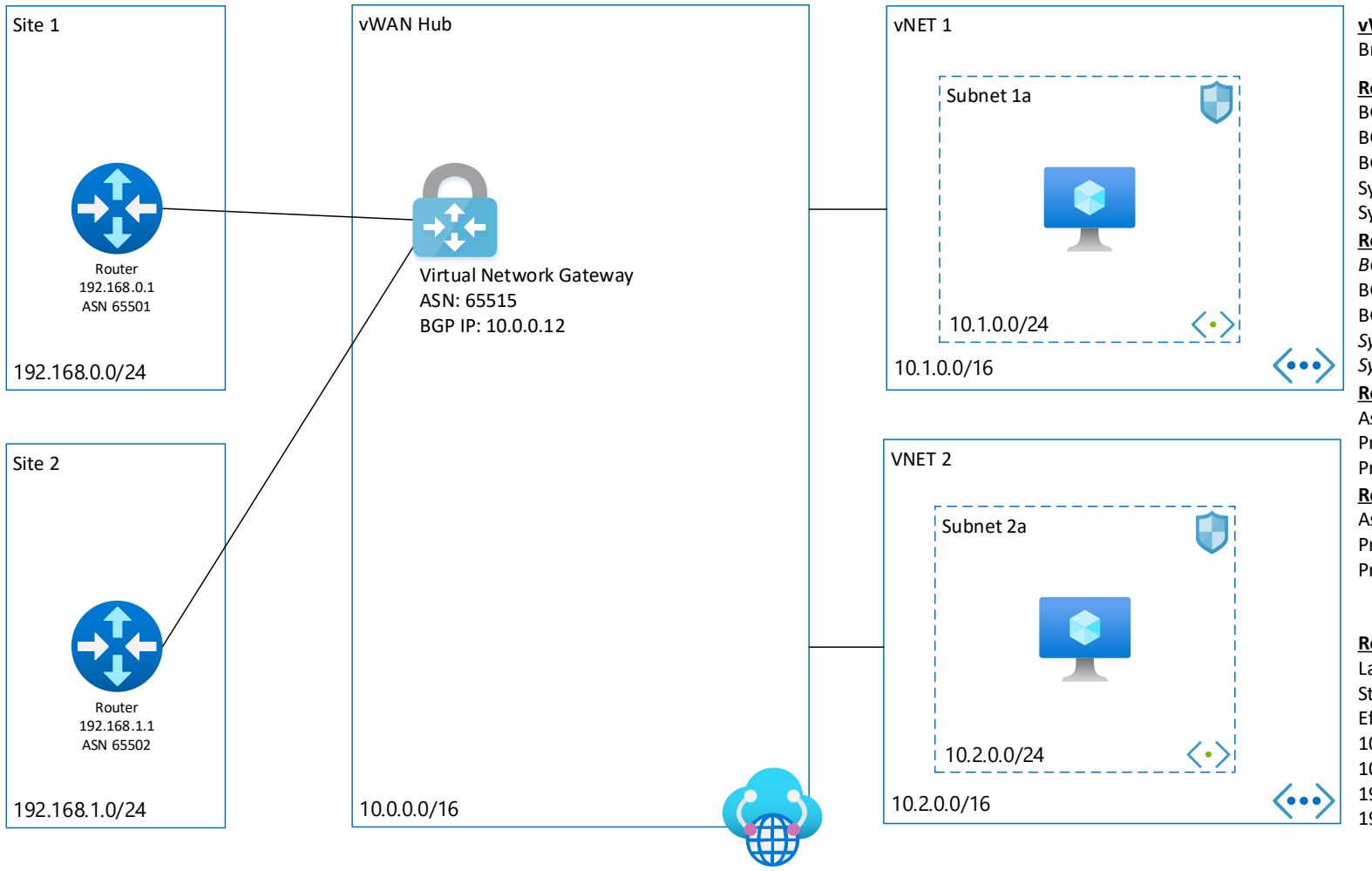
Region 1 – VNET2 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 1 – Default Route Table
Labels: Default
Static Routes:
Effective Routes:
10.1.0.0/16 to Virtual Network Connection
10.2.0.0/16 to Virtual Network Connection
192.168.0.0/24 to Virtual Network Gateway to 65501

VWAN - Single Region VWAN Hub With Multiple Branches

Site 1
BGP Peer: Virtual Network Gateway
Advertising: 192.168.0.0/24
Learned Routes:
10.0.0.0/16 to 10.0.0.12 65515
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515
192.168.1.0/24 to 10.0.0.12 65515 65502

Site 2
BGP Peer: Virtual Network Gateway
Advertising: 192.168.1.0/24
Learned Routes:
10.0.0.0/16 to 10.0.0.12 65515
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515
192.168.0.0/24 to 10.0.0.12 65515 65501



vWAN Settings
Branch-to-Branch: Enabled

Route Table vNET 1
BGP: 10.2.0.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/24 to Virtual Network Gateway
BGP: 192.168.1.0/24 to Virtual Network Gateway
System: 10.0.0.0/16 to vNET Peering
System: 10.1.0.0/16 to Virtual Network

Route Table vNET 2
BGP: 10.1.0.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/24 to Virtual Network Gateway
BGP: 192.168.0.0/24 to Virtual Network Gateway
System: 10.0.0.0/16 to vNET Peering
System: 10.2.0.0/16 to Virtual Network

Region 1 – VNET1 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

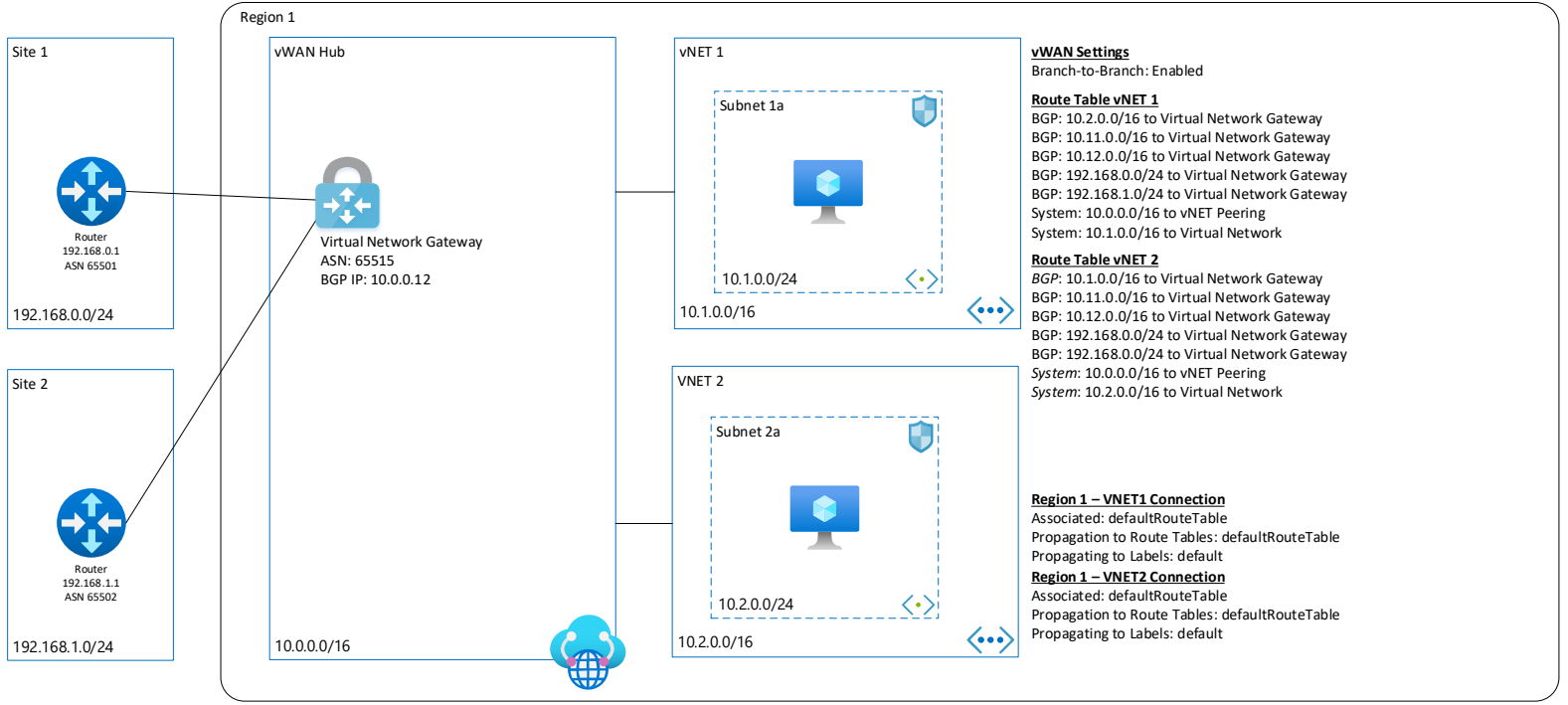
Region 1 – VNET2 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 1 – Default Route Table
Labels: Default
Static Routes:
Effective Routes:
10.1.0.0/16 to Virtual Network Connection
10.2.0.0/16 to Virtual Network Connection
192.168.0.0/24 to Virtual Network Gateway to 65501
192.168.0.0/24 to Virtual Network Gateway to 65502

VWAN - Multiple Region VWAN Hubs With Multiple Branches Connected to a Single Hub

Site 1
BGP Peer: Virtual Network Gateway
Advertising: 192.168.0.0/24
Learned Routes:
10.0.0.0/16 to 10.0.0.12 65515
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515
10.11.0.0/16 to 10.0.0.12 to 65515 65520
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.1.0/24 to 10.0.0.12 65515 65502

Site 2
BGP Peer: Virtual Network Gateway
Advertising: 192.168.1.0/24
Learned Routes:
10.0.0.0/16 to 10.0.0.12 65515
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515
10.11.0.0/16 to 10.0.0.12 to 65515 65520
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.0.0/24 to 10.0.0.12 65515 65501



vWAN Settings
Branch-to-Branch: Enabled

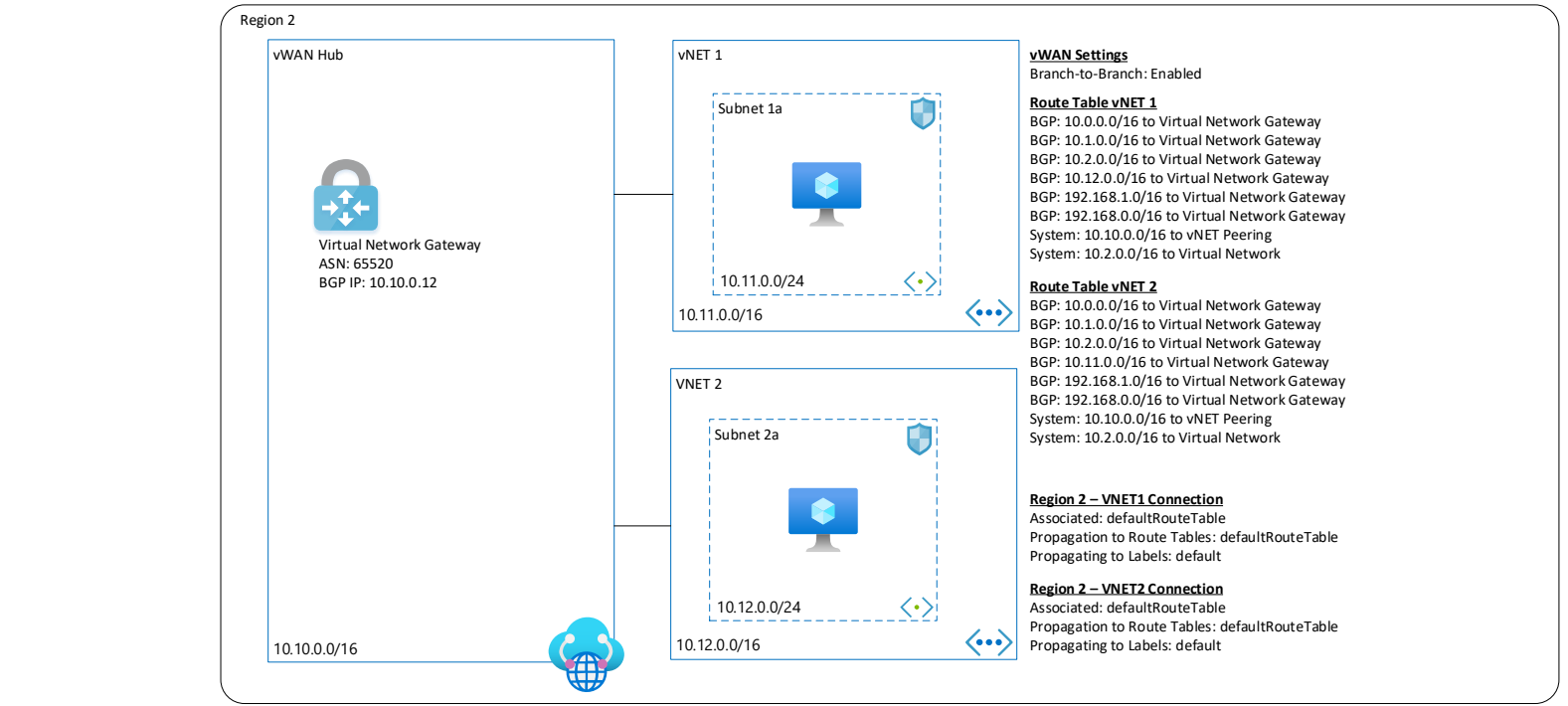
Route Table vNET 1
BGP: 10.2.0.0/16 to Virtual Network Gateway
BGP: 10.11.0.0/16 to Virtual Network Gateway
BGP: 10.12.0.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/24 to Virtual Network Gateway
BGP: 192.168.1.0/24 to Virtual Network Gateway
System: 10.0.0.0/16 to vNET Peering
System: 10.1.0.0/16 to Virtual Network

Route Table vNET 2
BGP: 10.1.0.0/16 to Virtual Network Gateway
BGP: 10.11.0.0/16 to Virtual Network Gateway
BGP: 10.12.0.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/24 to Virtual Network Gateway
BGP: 192.168.0.0/24 to Virtual Network Gateway
System: 10.0.0.0/16 to vNET Peering
System: 10.2.0.0/16 to Virtual Network

Region 1 – VNET1 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 1 – VNET2 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 1 – Default Route Table
Labels: Default
Static Routes:
Effective Routes:
10.1.0.0/16 to Virtual Network Connection
10.2.0.0/16 to Virtual Network Connection
10.11.0.0/16 to Remote Hub to 65520 65520
10.12.0.0/16 to Remote Hub to 65520 65520
192.168.0.0/24 to Virtual Network Gateway to 65501
192.168.0.0/24 to Virtual Network Gateway to 65502



vWAN Settings
Branch-to-Branch: Enabled

Route Table vNET 1
BGP: 10.0.0.0/16 to Virtual Network Gateway
BGP: 10.1.0.0/16 to Virtual Network Gateway
BGP: 10.2.0.0/16 to Virtual Network Gateway
BGP: 10.12.0.0/16 to Virtual Network Gateway
BGP: 192.168.1.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/16 to Virtual Network Gateway
System: 10.10.0.0/16 to vNET Peering
System: 10.2.0.0/16 to Virtual Network

Route Table vNET 2
BGP: 10.0.0.0/16 to Virtual Network Gateway
BGP: 10.1.0.0/16 to Virtual Network Gateway
BGP: 10.2.0.0/16 to Virtual Network Gateway
BGP: 10.11.0.0/16 to Virtual Network Gateway
BGP: 192.168.1.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/16 to Virtual Network Gateway
System: 10.10.0.0/16 to vNET Peering
System: 10.2.0.0/16 to Virtual Network

Region 2 – VNET1 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 2 – VNET2 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 2 – Default Route Table
Labels: Default
Static Routes:
Effective Routes:
10.1.0.0/16 to Remote Hub to 65520 65520
10.2.0.0/16 to Remote Hub to 65520 65520
10.11.0.0/16 to Virtual Network Connection
10.12.0.0/16 to Virtual Network Connection
192.168.0.0/24 to Remote Hub to 65520 65520 65501
192.168.0.0/24 to Remote Hub to 65520 65520 65502

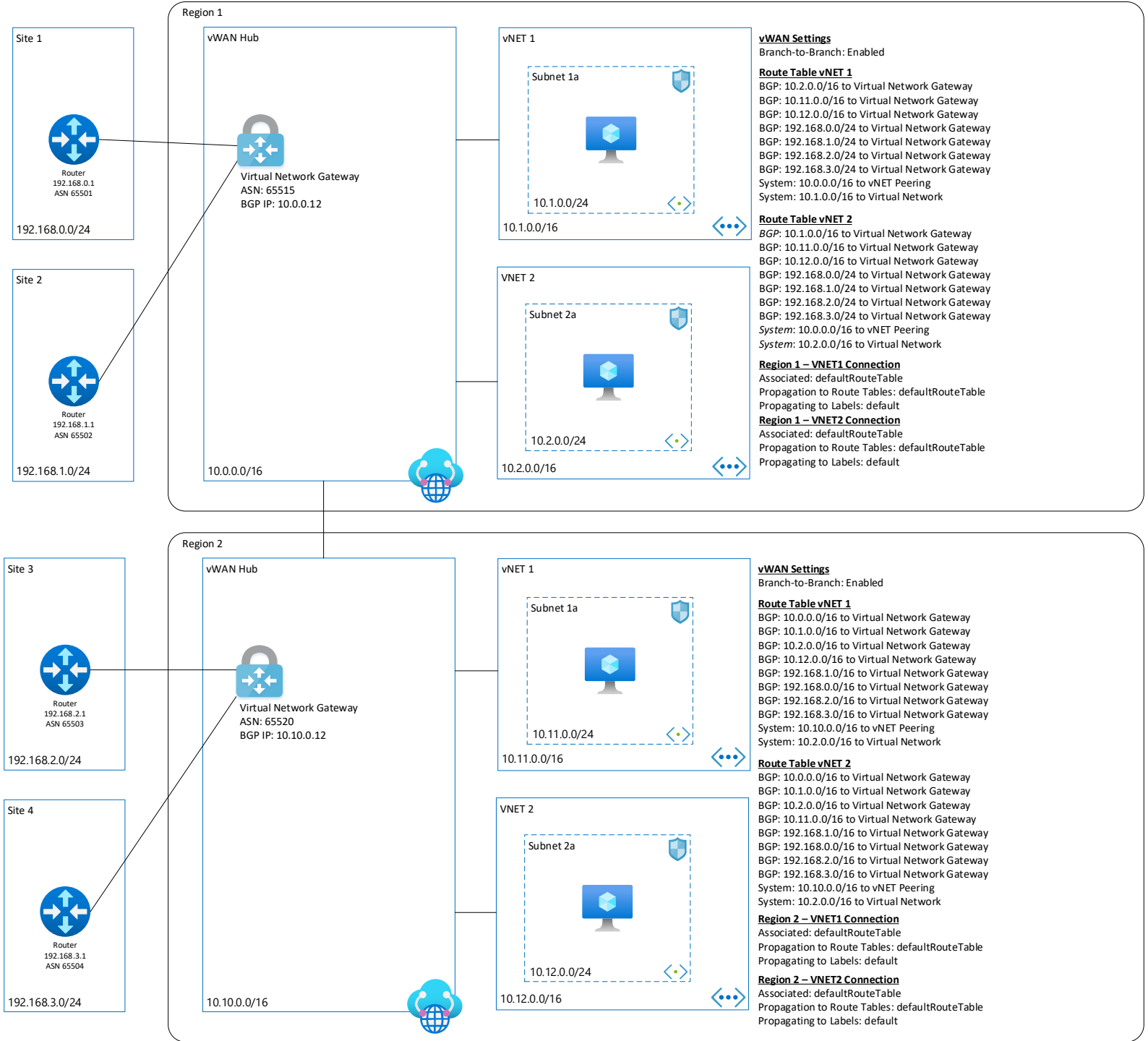
VWAN - Multiple Region VWAN Hubs With Multiple Branches Connected to Multiple Hubs

Site 1
BGP Peer: Virtual Network Gateway
Advertising: 192.168.0.0/24
Learned Routes:
10.0.0.0/16 to 10.0.0.12 65515
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515
10.11.0.0/16 to 10.0.0.12 to 65515 65520
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.1.0/24 to 10.0.0.12 65515 65502
192.168.2.0/24 to 10.0.0.12 65515 65520 65503
192.168.3.0/24 to 10.0.0.12 65515 65520 65504

Site 2
BGP Peer: Virtual Network Gateway
Advertising: 192.168.1.0/24
Learned Routes:
10.0.0.0/16 to 10.0.0.12 65515
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515
10.11.0.0/16 to 10.0.0.12 to 65515 65520
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.0.0/24 to 10.0.0.12 65515 65501
192.168.2.0/24 to 10.0.0.12 65515 65520 65503
192.168.3.0/24 to 10.0.0.12 65515 65520 65504

Site 3
BGP Peer: Virtual Network Gateway
Advertising: 192.168.2.0/24
Learned Routes:
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515
10.10.0.0/16 to 10.10.0.12 65515
10.11.0.0/16 to 10.0.0.12 to 65515 65520
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.0.0/24 to 10.0.0.12 65515 65520 65501
192.168.1.0/24 to 10.0.0.12 65515 65520 65502
192.168.3.0/24 to 10.0.0.12 65515 65504

Site 4
BGP Peer: Virtual Network Gateway
Advertising: 192.168.2.0/24
Learned Routes:
10.1.0.0/16 to 10.0.0.12 65515 65520
10.2.0.0/16 to 10.0.0.12 65515 65520
10.10.0.0/16 to 10.0.0.12 to 65520 65515
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.0.0/24 to 10.0.0.12 65515 65520 65501
192.168.1.0/24 to 10.0.0.12 65515 65520 65502
192.168.2.0/24 to 10.0.0.12 65515 65503



vWAN Settings
Branch-to-Branch: Enabled

Route Table vNET 1
BGP: 10.2.0.0/16 to Virtual Network Gateway
BGP: 10.11.0.0/16 to Virtual Network Gateway
BGP: 10.12.0.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/24 to Virtual Network Gateway
BGP: 192.168.1.0/24 to Virtual Network Gateway
BGP: 192.168.2.0/24 to Virtual Network Gateway
BGP: 192.168.3.0/24 to Virtual Network Gateway
System: 10.0.0.0/16 to vNET Peering
System: 10.1.0.0/16 to Virtual Network

Route Table vNET 2
BGP: 10.1.0.0/16 to Virtual Network Gateway
BGP: 10.11.0.0/16 to Virtual Network Gateway
BGP: 10.12.0.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/24 to Virtual Network Gateway
BGP: 192.168.1.0/24 to Virtual Network Gateway
BGP: 192.168.2.0/24 to Virtual Network Gateway
BGP: 192.168.3.0/24 to Virtual Network Gateway
System: 10.0.0.0/16 to vNET Peering
System: 10.2.0.0/16 to Virtual Network

Region 1 – VNET1 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 1 – VNET2 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

vWAN Settings
Branch-to-Branch: Enabled

Route Table vNET 1
BGP: 10.0.0.0/16 to Virtual Network Gateway
BGP: 10.1.0.0/16 to Virtual Network Gateway
BGP: 10.2.0.0/16 to Virtual Network Gateway
BGP: 10.12.0.0/16 to Virtual Network Gateway
BGP: 192.168.1.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/16 to Virtual Network Gateway
BGP: 192.168.2.0/16 to Virtual Network Gateway
BGP: 192.168.3.0/16 to Virtual Network Gateway
System: 10.10.0.0/16 to vNET Peering
System: 10.2.0.0/16 to Virtual Network

Route Table vNET 2
BGP: 10.0.0.0/16 to Virtual Network Gateway
BGP: 10.1.0.0/16 to Virtual Network Gateway
BGP: 10.2.0.0/16 to Virtual Network Gateway
BGP: 10.11.0.0/16 to Virtual Network Gateway
BGP: 192.168.1.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/16 to Virtual Network Gateway
BGP: 192.168.2.0/16 to Virtual Network Gateway
BGP: 192.168.3.0/16 to Virtual Network Gateway
System: 10.10.0.0/16 to vNET Peering
System: 10.2.0.0/16 to Virtual Network

Region 2 – VNET1 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 2 – VNET2 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 1 – Default Route Table
Labels: Default
Static Routes:
Effective Routes:
10.1.0.0/16 to Virtual Network Connection
10.2.0.0/16 to Virtual Network Connection
10.11.0.0/16 to Remote Hub to 65520 65520
10.12.0.0/16 to Remote Hub to 65520 65520
192.168.0.0/24 to Virtual Network Gateway to 65501
192.168.1.0/24 to Virtual Network Gateway to 65502
192.168.2.0/24 to Remote Hub to 65520 65503
192.168.3.0/24 to Remote Hub to 65520 65504

Region 2 – Default Route Table
Labels: Default
Static Routes:
Effective Routes:
10.1.0.0/16 to Remote Hub to 65520 65520
10.2.0.0/16 to Remote Hub to 65520 65520
10.11.0.0/16 to Virtual Network Connection
10.12.0.0/16 to Virtual Network Connection
192.168.0.0/24 to Remote Hub to 65520 65520 65501
192.168.1.0/24 to Remote Hub to 65520 65520 65502
192.168.2.0/24 to Virtual Network Gateway to 65503
192.168.3.0/24 to Virtual Network Gateway to 65504

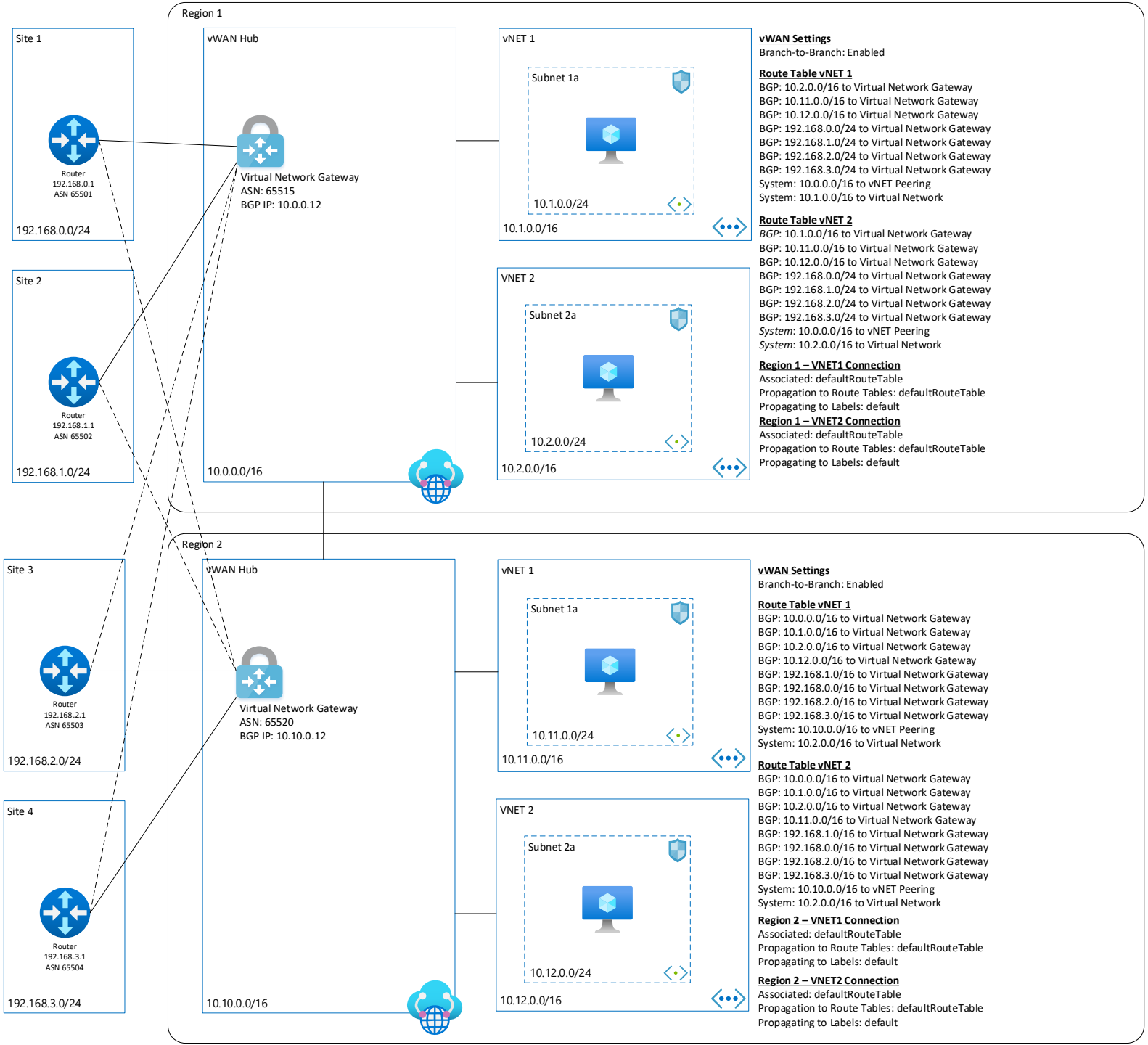
VWAN - Multiple Region VWAN Hubs With Multiple Branches Connected to Multiple Hubs For Redundancy

Site 1
BGP Peer: Virtual Network Gateway
Advertising: 192.168.0.0/24
Learned Routes:
10.0.0.0/16 to 10.0.0.12 65515
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515
10.11.0.0/16 to 10.0.0.12 to 65515 65520
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.1.0/24 to 10.0.0.12 65515 65502
192.168.1.0/24 to 10.10.0.12 6615 65520 6502
192.168.2.0/24 to 10.0.0.12 65515 65520 65503
192.168.2.0/24 to 10.10.0.12 6615 65520 6503
192.168.3.0/24 to 10.0.0.12 65515 65520 65504
192.168.3.0/24 to 10.10.0.12 6615 65520 65504

Site 2
BGP Peer: Virtual Network Gateway
Advertising: 192.168.1.0/24
Learned Routes:
10.0.0.0/16 to 10.0.0.12 65515
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515
10.11.0.0/16 to 10.0.0.12 to 65515 65520
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.0.0/24 to 10.0.0.12 65515 65501
192.168.0.0/24 to 10.0.0.12 65515 65520 65501
192.168.2.0/24 to 10.0.0.12 65515 65520 65503
192.168.2.0/24 to 10.0.0.12 65515 65520 65503
192.168.3.0/24 to 10.0.0.12 65515 65520 65504
192.168.3.0/24 to 10.0.0.12 65515 65520 65504

Site 3
BGP Peer: Virtual Network Gateway
Advertising: 192.168.2.0/24
Learned Routes:
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515
10.10.0.0/16 to 10.10.0.12 65515
10.11.0.0/16 to 10.0.0.12 to 65515 65520
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.0.0/24 to 10.0.0.12 65515 65501
192.168.0.0/24 to 10.0.0.12 65515 65520 65501
192.168.1.0/24 to 10.0.0.12 65515 65502
192.168.1.0/24 to 10.0.0.12 65515 65520 65502
192.168.3.0/24 to 10.0.0.12 65515 65504
192.168.3.0/24 to 10.0.0.12 65515 65520 65504

Site 4
BGP Peer: Virtual Network Gateway
Advertising: 192.168.3.0/24
Learned Routes:
10.1.0.0/16 to 10.0.0.12 65515 65520
10.2.0.0/16 to 10.0.0.12 65515 65520
10.10.0.0/16 to 10.0.0.12 to 65520 65515
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.0.0/24 to 10.0.0.12 65515 65501
192.168.0.0/24 to 10.0.0.12 65515 65520 65501
192.168.1.0/24 to 10.0.0.12 65515 65502
192.168.1.0/24 to 10.0.0.12 65515 65520 655012
192.168.2.0/24 to 10.0.0.12 65515 65503
192.168.2.0/24 to 10.0.0.12 65515 65520 655013



vWAN Settings
Branch-to-Branch: Enabled

Route Table vNET 1
BGP: 10.2.0.0/16 to Virtual Network Gateway
BGP: 10.11.0.0/16 to Virtual Network Gateway
BGP: 10.12.0.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/24 to Virtual Network Gateway
BGP: 192.168.1.0/24 to Virtual Network Gateway
BGP: 192.168.2.0/24 to Virtual Network Gateway
BGP: 192.168.3.0/24 to Virtual Network Gateway
System: 10.0.0.0/16 to vNET Peering
System: 10.1.0.0/16 to Virtual Network

Route Table vNET 2
BGP: 10.1.0.0/16 to Virtual Network Gateway
BGP: 10.11.0.0/16 to Virtual Network Gateway
BGP: 10.12.0.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/24 to Virtual Network Gateway
BGP: 192.168.1.0/24 to Virtual Network Gateway
BGP: 192.168.2.0/24 to Virtual Network Gateway
BGP: 192.168.3.0/24 to Virtual Network Gateway
System: 10.0.0.0/16 to vNET Peering
System: 10.2.0.0/16 to Virtual Network

Region 1 – VNET1 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 1 – VNET2 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 1 – Default Route Table
Labels: Default
Static Routes:
Effective Routes:
10.1.0.0/16 to Virtual Network Connection
10.2.0.0/16 to Virtual Network Connection
10.11.0.0/16 to Remote Hub to 65520 65520
10.12.0.0/16 to Remote Hub to 65520 65520
192.168.0.0/24 to Virtual Network Gateway to 65501
192.168.1.0/24 to Virtual Network Gateway to 65502
192.168.2.0/24 to Remote Hub to 65520 65503
192.168.3.0/24 to Remote Hub to 65520 65504

vWAN Settings
Branch-to-Branch: Enabled

Route Table vNET 1
BGP: 10.0.0.0/16 to Virtual Network Gateway
BGP: 10.1.0.0/16 to Virtual Network Gateway
BGP: 10.2.0.0/16 to Virtual Network Gateway
BGP: 10.12.0.0/16 to Virtual Network Gateway
BGP: 192.168.1.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/16 to Virtual Network Gateway
BGP: 192.168.2.0/16 to Virtual Network Gateway
BGP: 192.168.3.0/16 to Virtual Network Gateway
System: 10.10.0.0/16 to vNET Peering
System: 10.2.0.0/16 to Virtual Network

Route Table vNET 2
BGP: 10.0.0.0/16 to Virtual Network Gateway
BGP: 10.1.0.0/16 to Virtual Network Gateway
BGP: 10.2.0.0/16 to Virtual Network Gateway
BGP: 10.11.0.0/16 to Virtual Network Gateway
BGP: 192.168.1.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/16 to Virtual Network Gateway
BGP: 192.168.2.0/16 to Virtual Network Gateway
BGP: 192.168.3.0/16 to Virtual Network Gateway
System: 10.10.0.0/16 to vNET Peering
System: 10.2.0.0/16 to Virtual Network

Region 2 – VNET1 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 2 – VNET2 Connection
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 2 – Default Route Table
Labels: Default
Static Routes:
Effective Routes:
10.1.0.0/16 to Remote Hub to 65520 65520
10.2.0.0/16 to Remote Hub to 65520 65520
10.11.0.0/16 to Virtual Network Connection
10.12.0.0/16 to Virtual Network Connection
192.168.0.0/24 to Remote Hub to 65520 65520 65501
192.168.1.0/24 to Remote Hub to 65520 65520 65502
192.168.2.0/24 to Virtual Network Gateway to 65503
192.168.3.0/24 to Virtual Network Gateway to 65504

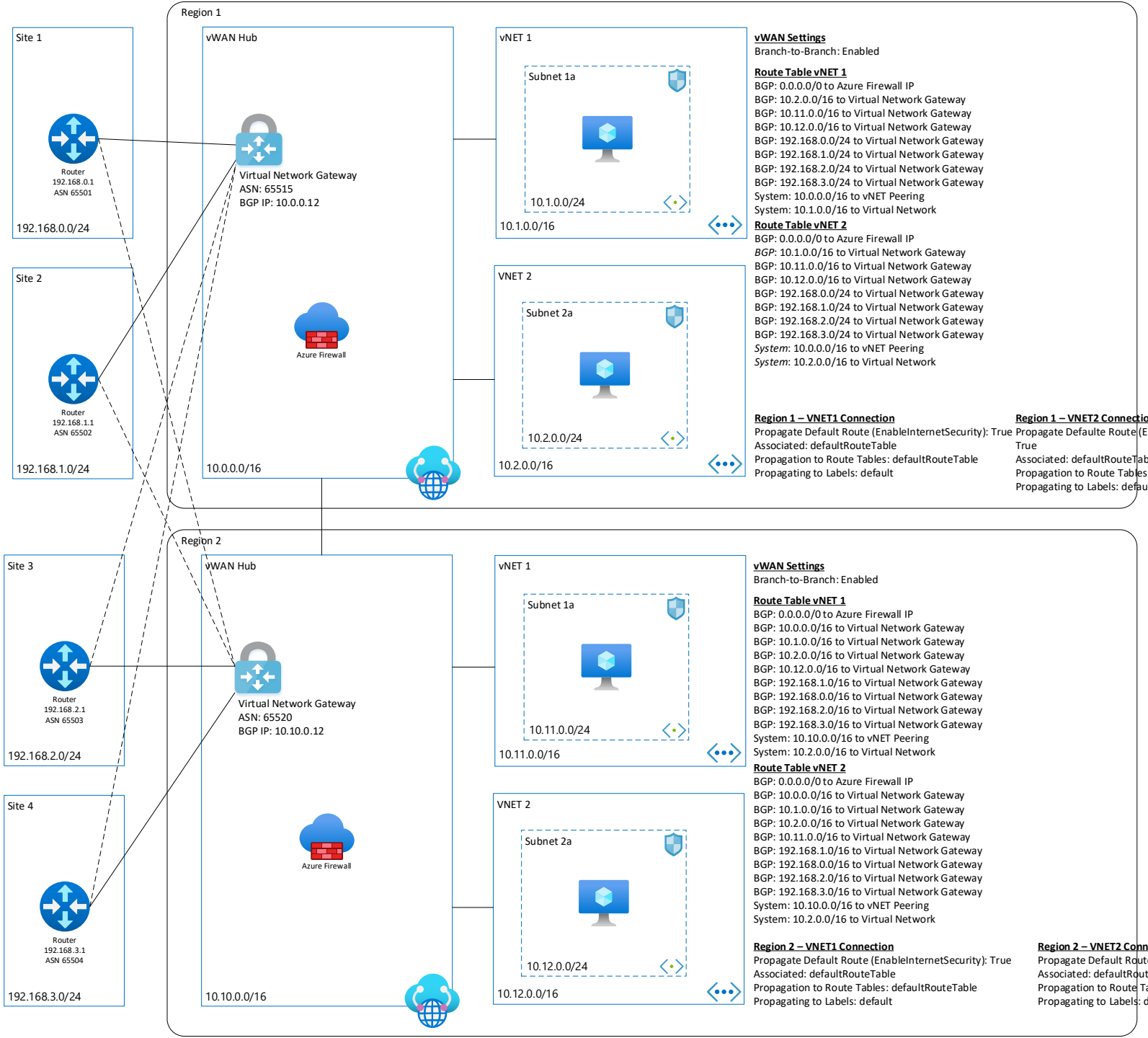
VWAN - Multiple Region VWAN Secure Hubs with Multiple Branches Connected to Multiple Hubs for Redundancy and North and South Firewall Using Routing Intent

Site 1
BGP Peer: Virtual Network Gateway
Advertising: 192.168.0.0/24
Learned Routes:
0.0.0.0/0 to 10.0.0.12 65515
0.0.0.0/0 to 10.10.0.12 65520
10.0.0.0/16 to 10.0.0.12 65515
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515
10.11.0.0/16 to 10.0.0.12 to 65515 65520
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.1.0/24 to 10.0.0.12 65515 65502
192.168.1.0/24 to 10.10.0.12 6615 65520 6502
192.168.2.0/24 to 10.0.0.12 65515 65520 65503
192.168.2.0/24 to 10.10.0.12 6615 65520 6503
192.168.3.0/24 to 10.0.0.12 65515 65520 65504
192.168.3.0/24 to 10.10.0.12 6615 65520 65504

Site 2
BGP Peer: Virtual Network Gateway
Advertising: 192.168.1.0/24
Learned Routes:
0.0.0.0/0 to 10.0.0.12 65515
0.0.0.0/0 to 10.10.0.12 65520
10.0.0.0/16 to 10.0.0.12 65515
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515
10.11.0.0/16 to 10.0.0.12 to 65515 65520
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.0.0/24 to 10.0.0.12 65515 65501
192.168.0.0/24 to 10.0.0.12 65515 65520 65501
192.168.2.0/24 to 10.0.0.12 65515 65520 65503
192.168.2.0/24 to 10.0.0.12 65515 65520 65503
192.168.3.0/24 to 10.0.0.12 65515 65520 65504
192.168.3.0/24 to 10.0.0.12 65515 65520 65504

Site 3
BGP Peer: Virtual Network Gateway
Advertising: 192.168.2.0/24
Learned Routes:
0.0.0.0/0 to 10.0.0.12 65515
0.0.0.0/0 to 10.10.0.12 65520
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515
10.10.0.0/16 to 10.10.0.12 65515
10.11.0.0/16 to 10.0.0.12 to 65515 65520
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.0.0/24 to 10.0.0.12 65515 65501
192.168.0.0/24 to 10.0.0.12 65515 65520 65501
192.168.1.0/24 to 10.0.0.12 65515 65502
192.168.1.0/24 to 10.0.0.12 65515 65520 65502
192.168.3.0/24 to 10.0.0.12 65515 65504
192.168.3.0/24 to 10.0.0.12 65515 65520 65504

Site 4
BGP Peer: Virtual Network Gateway
Advertising: 192.168.3.0/24
Learned Routes:
0.0.0.0/0 to 10.0.0.12 65515
0.0.0.0/0 to 10.10.0.12 65520
10.1.0.0/16 to 10.0.0.12 65515 65520
10.2.0.0/16 to 10.0.0.12 65515 65520
10.10.0.0/16 to 10.0.0.12 to 65520 65515
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.0.0/24 to 10.0.0.12 65515 65501
192.168.0.0/24 to 10.0.0.12 65515 65520 65501
192.168.1.0/24 to 10.0.0.12 65515 65502
192.168.1.0/24 to 10.0.0.12 65515 65520 655012
192.168.2.0/24 to 10.0.0.12 65515 65503
192.168.2.0/24 to 10.0.0.12 65515 65520 655013



vWAN Settings
Branch-to-Branch: Enabled

Route Table vNET 1
BGP: 0.0.0.0/0 to Azure Firewall IP
BGP: 10.2.0.0/16 to Virtual Network Gateway
BGP: 10.11.0.0/16 to Virtual Network Gateway
BGP: 10.12.0.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/24 to Virtual Network Gateway
BGP: 192.168.1.0/24 to Virtual Network Gateway
BGP: 192.168.2.0/24 to Virtual Network Gateway
BGP: 192.168.3.0/24 to Virtual Network Gateway
System: 10.0.0.0/16 to vNET Peering
System: 10.1.0.0/16 to Virtual Network

Route Table vNET 2
BGP: 0.0.0.0/0 to Azure Firewall IP
BGP: 10.1.0.0/16 to Virtual Network Gateway
BGP: 10.11.0.0/16 to Virtual Network Gateway
BGP: 10.12.0.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/24 to Virtual Network Gateway
BGP: 192.168.1.0/24 to Virtual Network Gateway
BGP: 192.168.2.0/24 to Virtual Network Gateway
BGP: 192.168.3.0/24 to Virtual Network Gateway
System: 10.0.0.0/16 to vNET Peering
System: 10.2.0.0/16 to Virtual Network

Region 1 – VNET1 Connection
Propagate Default Route (EnableInternetSecurity): True
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 1 – VNET2 Connection
Propagate Defaulte Route (EnableInternetSecurity):
True
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 1 – Default Route Table
Labels: Default
Static Routes:
_policy_Internet to 0.0.0.0/0 to Azure Firewall Region 1
Effective Routes:
0.0.0.0/0 to Azure Firewall Region 1
10.1.0.0/16 to Virtual Network Connection
10.2.0.0/16 to Virtual Network Connection
10.11.0.0/16 to Remote Hub to 65520 65520
10.12.0.0/16 to Remote Hub to 65520 65520
192.168.0.0/24 to Virtual Network Gateway to 65501
192.168.1.0/24 to Virtual Network Gateway to 65502
192.168.2.0/24 to Remote Hub to 65520 65503
192.168.3.0/24 to Remote Hub to 65520 65504

vWAN Settings
Branch-to-Branch: Enabled

Route Table vNET 1
BGP: 0.0.0.0/0 to Azure Firewall IP
BGP: 10.0.0.0/16 to Virtual Network Gateway
BGP: 10.1.0.0/16 to Virtual Network Gateway
BGP: 10.2.0.0/16 to Virtual Network Gateway
BGP: 10.12.0.0/16 to Virtual Network Gateway
BGP: 192.168.1.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/16 to Virtual Network Gateway
BGP: 192.168.2.0/16 to Virtual Network Gateway
BGP: 192.168.3.0/16 to Virtual Network Gateway
System: 10.10.0.0/16 to vNET Peering
System: 10.2.0.0/16 to Virtual Network

Route Table vNET 2
BGP: 0.0.0.0/0 to Azure Firewall IP
BGP: 10.0.0.0/16 to Virtual Network Gateway
BGP: 10.1.0.0/16 to Virtual Network Gateway
BGP: 10.2.0.0/16 to Virtual Network Gateway
BGP: 10.11.0.0/16 to Virtual Network Gateway
BGP: 192.168.1.0/16 to Virtual Network Gateway
BGP: 192.168.0.0/16 to Virtual Network Gateway
BGP: 192.168.2.0/16 to Virtual Network Gateway
BGP: 192.168.3.0/16 to Virtual Network Gateway
System: 10.10.0.0/16 to vNET Peering
System: 10.2.0.0/16 to Virtual Network

Region 2 – VNET1 Connection
Propagate Default Route (EnableInternetSecurity): True
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 2 – VNET2 Connection
Propagate Default Route (EnableInternetSecurity): True
Associated: defaultRouteTable
Propagation to Route Tables: defaultRouteTable
Propagating to Labels: default

Region 2 – Default Route Table
Labels: Default
Static Routes:
_policy_Internet to 0.0.0.0/0 to Azure Firewall Region 2
Effective Routes:
0.0.0.0/0 to Azure Firewall Region 2
10.1.0.0/16 to Remote Hub to 65520 65520
10.2.0.0/16 to Remote Hub to 65520 65520
10.11.0.0/16 to Virtual Network Connection
10.12.0.0/16 to Virtual Network Connection
192.168.0.0/24 to Remote Hub to 65520 65520 65501
192.168.1.0/24 to Remote Hub to 65520 65520 65502
192.168.2.0/24 to Virtual Network Gateway to 65503
192.168.3.0/24 to Virtual Network Gateway to 65504

VWAN - Multiple Region VWAN Secure Hubs with Multiple Branches Connected to Multiple Hubs for Redundancy and North/South and East/West Firewall Using Routing Intent

vWAN Settings
Branch-to-Branch: Enabled

Secure Hub Routing Intent
Region 1 hub:
- Internet Traffic Routing Policy: Enabled
- Private Traffic Routing Policy: Enabled

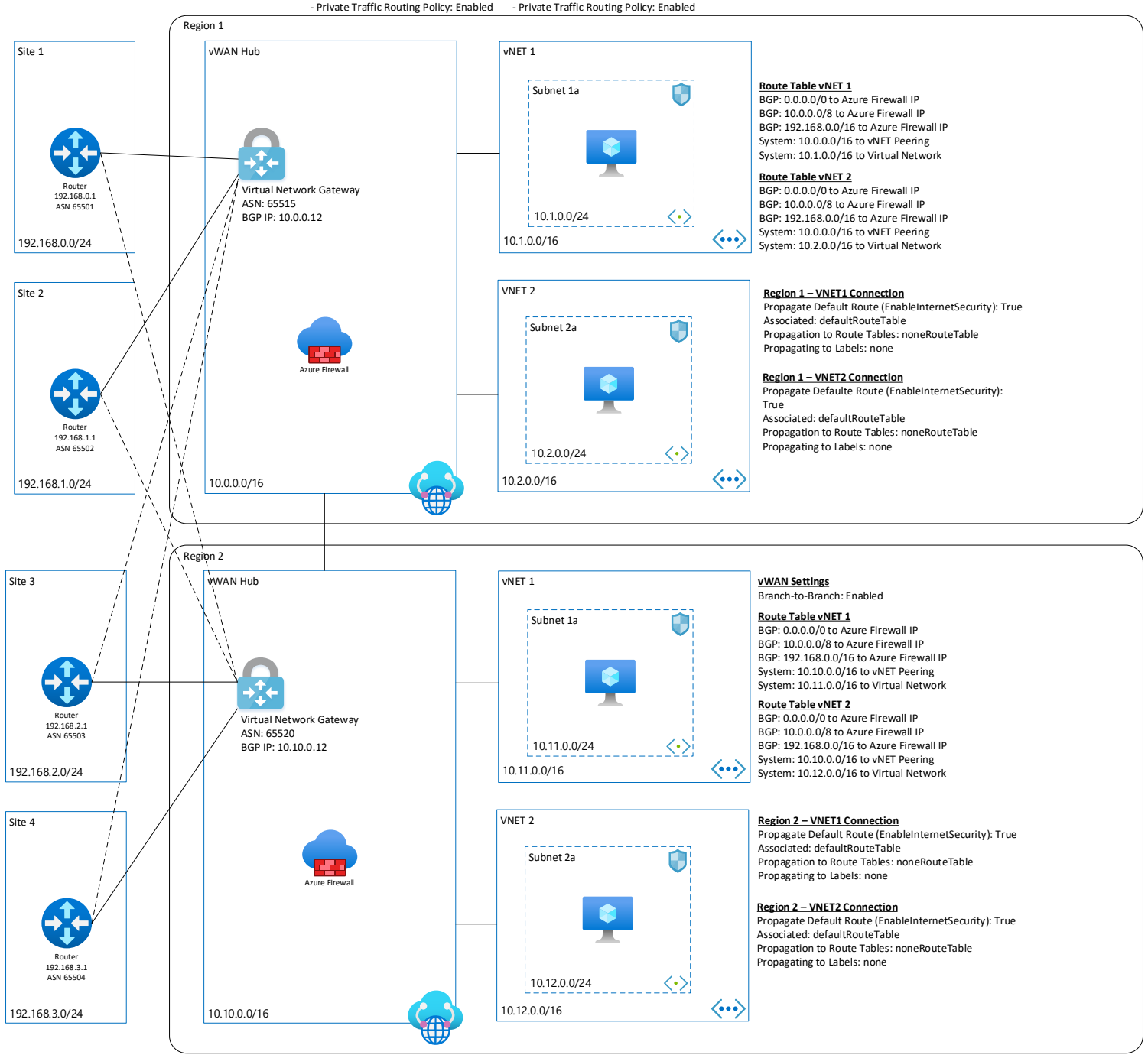
Secure Hub Routing Intent
Region 2 hub:
- Internet Traffic Routing Policy: Enabled
- Private Traffic Routing Policy: Enabled

Site 1
BGP Peer: Virtual Network Gateway
Advertising: 192.168.0.0/24
Learned Routes:
0.0.0.0/0 to 10.0.0.12 65515
0.0.0.0/0 to 10.10.0.12 65520
10.0.0.0/16 to 10.0.0.12 65515
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515
10.11.0.0/16 to 10.0.0.12 to 65515 65520
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.1.0/24 to 10.0.0.12 65515 65502
192.168.1.0/24 to 10.10.0.12 6615 65520 6502
192.168.2.0/24 to 10.0.0.12 65515 65520 65503
192.168.2.0/24 to 10.10.0.12 6615 65520 6503
192.168.3.0/24 to 10.0.0.12 65515 65520 65504
192.168.3.0/24 to 10.10.0.12 6615 65520 65504

Site 2
BGP Peer: Virtual Network Gateway
Advertising: 192.168.1.0/24
Learned Routes:
0.0.0.0/0 to 10.0.0.12 65515
0.0.0.0/0 to 10.10.0.12 65520
10.0.0.0/16 to 10.0.0.12 65515
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515
10.11.0.0/16 to 10.0.0.12 to 65515 65520
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.0.0/24 to 10.0.0.12 65515 65501
192.168.0.0/24 to 10.0.0.12 65515 65520 65501
192.168.2.0/24 to 10.0.0.12 65515 65520 65503
192.168.2.0/24 to 10.0.0.12 65515 65520 65503
192.168.3.0/24 to 10.0.0.12 65515 65520 65504
192.168.3.0/24 to 10.0.0.12 65515 65520 65504

Site 3
BGP Peer: Virtual Network Gateway
Advertising: 192.168.2.0/24
Learned Routes:
0.0.0.0/0 to 10.0.0.12 65515
0.0.0.0/0 to 10.10.0.12 65520
10.1.0.0/16 to 10.0.0.12 65515
10.2.0.0/16 to 10.0.0.12 65515
10.10.0.0/16 to 10.10.0.12 65515
10.11.0.0/16 to 10.0.0.12 to 65515 65520
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.0.0/24 to 10.0.0.12 65515 65501
192.168.0.0/24 to 10.0.0.12 65515 65520 65501
192.168.1.0/24 to 10.0.0.12 65515 65502
192.168.1.0/24 to 10.0.0.12 65515 65520 65502
192.168.3.0/24 to 10.0.0.12 65515 65504
192.168.3.0/24 to 10.0.0.12 65515 65520 65504

Site 4
BGP Peer: Virtual Network Gateway
Advertising: 192.168.3.0/24
Learned Routes:
0.0.0.0/0 to 10.0.0.12 65515
0.0.0.0/0 to 10.10.0.12 65520
10.1.0.0/16 to 10.0.0.12 65515 65520
10.2.0.0/16 to 10.0.0.12 65515 65520
10.10.0.0/16 to 10.0.0.12 to 65520 65515
10.12.0.0/16 to 10.0.0.12 to 65515 65520
192.168.0.0/24 to 10.0.0.12 65515 65501
192.168.0.0/24 to 10.0.0.12 65515 65520 65501
192.168.1.0/24 to 10.0.0.12 65515 65502
192.168.1.0/24 to 10.0.0.12 65515 65520 655012
192.168.2.0/24 to 10.0.0.12 65515 65503
192.168.2.0/24 to 10.0.0.12 65515 65520 655013



Route Table vNET 1
BGP: 0.0.0.0/0 to Azure Firewall IP
BGP: 10.0.0.0/8 to Azure Firewall IP
BGP: 192.168.0.0/16 to Azure Firewall IP
System: 10.0.0.0/16 to vNET Peering
System: 10.1.0.0/16 to Virtual Network

Route Table vNET 2
BGP: 0.0.0.0/0 to Azure Firewall IP
BGP: 10.0.0.0/8 to Azure Firewall IP
BGP: 192.168.0.0/16 to Azure Firewall IP
System: 10.0.0.0/16 to vNET Peering
System: 10.2.0.0/16 to Virtual Network

Region 1 – VNET1 Connection
Propagate Default Route (EnableInternetSecurity): True
Associated: defaultRouteTable
Propagation to Route Tables: noneRouteTable
Propagating to Labels: none

Region 1 – VNET2 Connection
Propagate Defaulte Route (EnableInternetSecurity): True
Associated: defaultRouteTable
Propagation to Route Tables: noneRouteTable
Propagating to Labels: none

vWAN Settings
Branch-to-Branch: Enabled

Route Table vNET 1
BGP: 0.0.0.0/0 to Azure Firewall IP
BGP: 10.0.0.0/8 to Azure Firewall IP
BGP: 192.168.0.0/16 to Azure Firewall IP
System: 10.10.0.0/16 to vNET Peering
System: 10.11.0.0/16 to Virtual Network

Route Table vNET 2
BGP: 0.0.0.0/0 to Azure Firewall IP
BGP: 10.0.0.0/8 to Azure Firewall IP
BGP: 192.168.0.0/16 to Azure Firewall IP
System: 10.10.0.0/16 to vNET Peering
System: 10.12.0.0/16 to Virtual Network

Region 2 – VNET1 Connection
Propagate Default Route (EnableInternetSecurity): True
Associated: defaultRouteTable
Propagation to Route Tables: noneRouteTable
Propagating to Labels: none

Region 2 – VNET2 Connection
Propagate Default Route (EnableInternetSecurity): True
Associated: defaultRouteTable
Propagation to Route Tables: noneRouteTable
Propagating to Labels: none

Region 1 – Default Route Table
Labels: Default
Static Routes:
_policy_Internet to 0.0.0.0/0 to Azure Firewall Region 1
_policy_privateTraffic to 10.0.0.0/8, 192.168.0.0/16 to Azure Firewall Region 1
Effective Routes:
0.0.0.0/0 to Azure Firewall Region 1
10.0.0.0/8 to Azure Firewall Region 1
192.168.0.0/16 to Azure Firewall Region 1

* Additional routes can be added in to the private traffic routing policy by named Private_traffic

Region 2 – Default Route Table
Labels: Default
Static Routes:
_policy_Internet to 0.0.0.0/0 to Azure Firewall Region 2
_policy_privateTraffic to 10.0.0.0/8, 192.168.0.0/16 to Azure Firewall Region 2
Effective Routes:
0.0.0.0/0 to Azure Firewall Region 2
10.0.0.0/8 to Remote Hub to Azure Firewall Region 2
192.168.0.0/16 to Remote Hub to Azure Firewall Region 2

* Additional routes can be added in to the private traffic routing policy by named PrivateTraffic

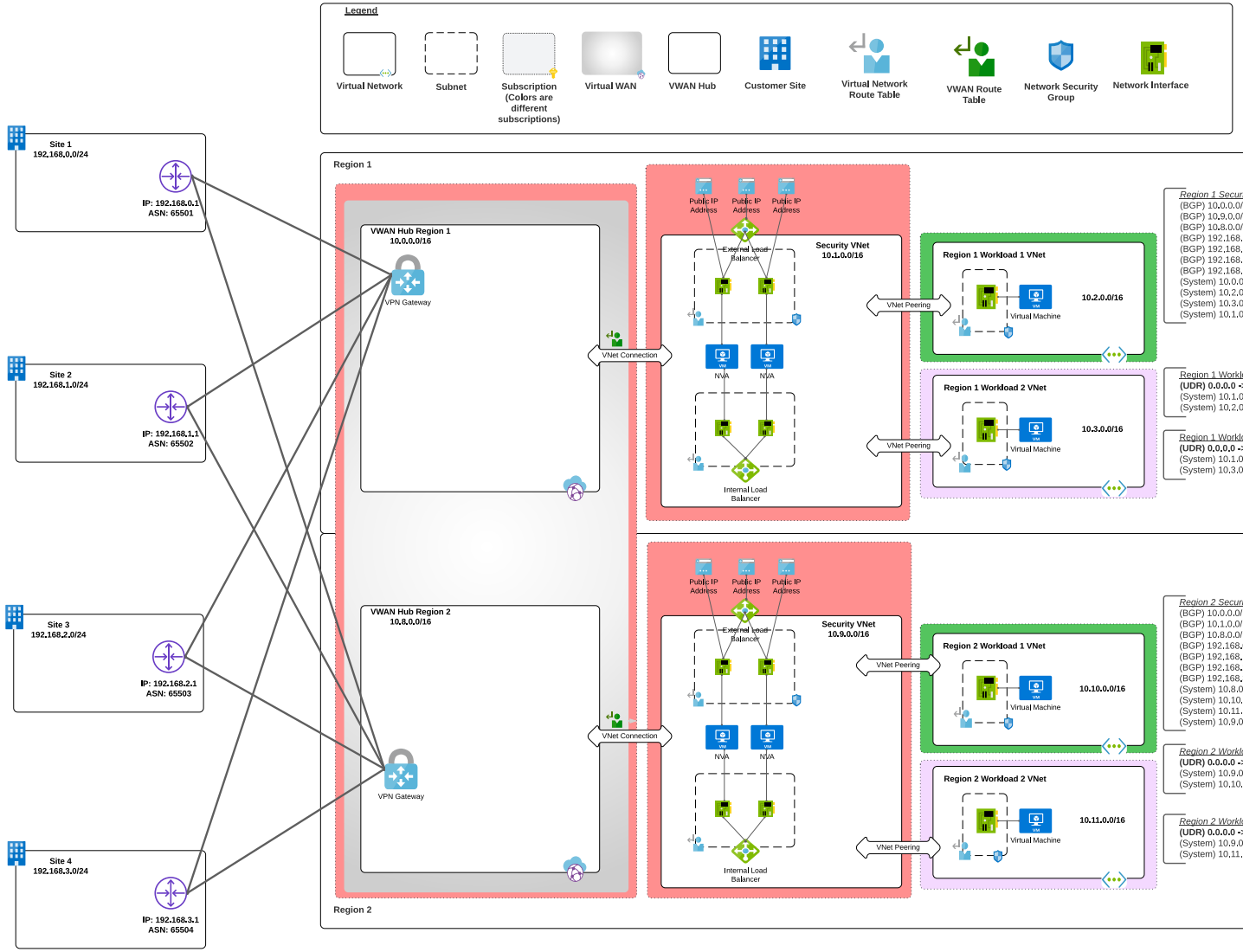
vWAN – Same as earlies with a third party firewall

Site 1
BGP Peer: Virtual Network Gateway
Advertising: 192.168.0.0/24
Learned Routes:
10.0.0.0/16 -> 10.0.0.12 65515
10.1.0.0/16 -> 10.0.0.12 65515
10.1.0.0/16 -> 10.8.0.12 65515 65520 65520
10.8.0.0/16 -> 10.8.0.12 65515
10.9.0.0/16 -> 10.8.0.12 65515
10.9.0.0/16 -> 10.8.0.12 65515 65520 65520
10.0.0.0/13 -> 10.0.0.12 65515
10.0.0.0/13 -> 10.8.0.12 65515
10.8.0.0/13 -> 10.0.0.12 65515
10.8.0.0/13 -> 10.8.0.12 65515
192.168.1.0/24 -> 10.0.0.12 65515 65502
192.168.1.0/24 -> 10.8.0.12 65515 65520 65520 65502
192.168.2.0/24 -> 10.8.0.12 65515 65503
192.168.2.0/24 -> 10.0.0.12 65515 65520 65520 65503
192.168.3.0/24 -> 10.8.0.12 65515 65504
192.168.3.0/24 -> 10.0.0.12 65515 65520 65520 65504

Site 2
BGP Peer: Virtual Network Gateway
Advertising: 192.168.1.0/24
Learned Routes:
10.0.0.0/16 -> 10.0.0.12 65515
10.1.0.0/16 -> 10.0.0.12 65515
10.1.0.0/16 -> 10.8.0.12 65515 65520 65520
10.8.0.0/16 -> 10.8.0.12 65515
10.9.0.0/16 -> 10.8.0.12 65515
10.9.0.0/16 -> 10.8.0.12 65515 65520 65520
10.0.0.0/13 -> 10.0.0.12 65515
10.0.0.0/13 -> 10.8.0.12 65515
10.8.0.0/13 -> 10.0.0.12 65515
10.8.0.0/13 -> 10.8.0.12 65515
192.168.0.0/24 -> 10.0.0.12 65515 65501
192.168.0.0/24 -> 10.8.0.12 65515 65520 65520 65501
192.168.2.0/24 -> 10.8.0.12 65515 65503
192.168.2.0/24 -> 10.0.0.12 65515 65520 65520 65503
192.168.3.0/24 -> 10.8.0.12 65515 65504
192.168.3.0/24 -> 10.0.0.12 65515 65520 65520 65504

Site 3
BGP Peer: Virtual Network Gateway
Advertising: 192.168.2.0/24
Learned Routes:
10.0.0.0/16 -> 10.0.0.12 65515
10.1.0.0/16 -> 10.0.0.12 65515
10.1.0.0/16 -> 10.8.0.12 65515 65520 65520
10.8.0.0/16 -> 10.8.0.12 65515
10.9.0.0/16 -> 10.8.0.12 65515
10.9.0.0/16 -> 10.8.0.12 65515 65520 65520
10.0.0.0/13 -> 10.0.0.12 65515
10.0.0.0/13 -> 10.8.0.12 65515
10.8.0.0/13 -> 10.0.0.12 65515
10.8.0.0/13 -> 10.8.0.12 65515
192.168.0.0/24 -> 10.0.0.12 65515 65501
192.168.0.0/24 -> 10.8.0.12 65515 65520 65520 65501
192.168.1.0/24 -> 10.8.0.12 65515 65502
192.168.1.0/24 -> 10.0.0.12 65515 65520 65520 65502
192.168.3.0/24 -> 10.8.0.12 65515 65504
192.168.3.0/24 -> 10.0.0.12 65515 65520 65520 65504

Site 4
BGP Peer: Virtual Network Gateway
Advertising: 192.168.3.0/24
Learned Routes:
10.0.0.0/16 -> 10.0.0.12 65515
10.1.0.0/16 -> 10.0.0.12 65515
10.1.0.0/16 -> 10.8.0.12 65515 65520 65520
10.8.0.0/16 -> 10.8.0.12 65515
10.9.0.0/16 -> 10.8.0.12 65515
10.9.0.0/16 -> 10.8.0.12 65515 65520 65520
10.0.0.0/13 -> 10.0.0.12 65515
10.0.0.0/13 -> 10.8.0.12 65515
10.8.0.0/13 -> 10.0.0.12 65515
10.8.0.0/13 -> 10.8.0.12 65515
192.168.0.0/24 -> 10.0.0.12 65515 65501
192.168.0.0/24 -> 10.8.0.12 65515 65520 65520 65501
192.168.1.0/24 -> 10.8.0.12 65515 65502
192.168.1.0/24 -> 10.0.0.12 65515 65520 65520 65502
192.168.2.0/24 -> 10.8.0.12 65515 65503
192.168.2.0/24 -> 10.0.0.12 65515 65520 65520 65503



VWAN Settings
Branch-to-Branch: Enabled
Branches Propagating to Route Table:
- defaultRouteTable
Branches Propagating to Labels:
- default

Region 1 Security Virtual Network Route Table
(BGP) 10.0.0.0/13 -> Virtual Network Gateway
(BGP) 10.9.0.0/16 -> Virtual Network Gateway
(BGP) 10.8.0.0/13 -> Virtual Network Gateway
(BGP) 192.168.0.0/24 -> Virtual Network Gateway
(BGP) 192.168.1.0/24 -> Virtual Network Gateway
(BGP) 192.168.2.0/24 -> Virtual Network Gateway
(BGP) 192.168.3.0/24 -> Virtual Network Gateway
(System) 10.0.0.0/16 -> VNet Peering
(System) 10.2.0.0/16 -> VNet Peering
(System) 10.3.0.0/16 -> VNet Peering
(System) 10.1.0.0/16 -> Virtual Network

Region 1 Security VNet Connection
Associated Route Table: defaultRouteTable
Propagating Route Tables:
Propagating Labels: default
Static Routes:
10.1.0.0/16 -> 10.1.0.100
10.2.0.0/16 -> 10.1.0.100
10.3.0.0/16 -> 10.1.0.100

Region 1 Default Route Table
Labels: default
Static Routes:
10.0.0.0/13 -> Region 1 Security VNet Connection
10.8.0.0/13 -> Region 2 Security VNet Connection
Effective Routes:
10.0.0.0/13 -> Region 1 Security VNet Connection
10.8.0.0/13 -> Region 2 Security VNet Connection
10.1.0.0/16 -> Virtual Network Connection
10.9.0.0/16 -> Remote Hub -> 65520 65520
192.168.0.0/24 -> Virtual Network Gateway -> 65501
192.168.1.0/24 -> Virtual Network Gateway -> 65502
192.168.2.0/24 -> Virtual Network Gateway -> 65503
192.168.3.0/24 -> Virtual Network Gateway -> 65504

Region 1 Workload Virtual Network 1 Route Table
(UDR) 0.0.0.0 -> NVA ILB IP
(System) 10.1.0.0/16 -> VNet Peering
(System) 10.2.0.0/16 -> Virtual Network

Region 1 Workload Virtual Network 2 Route Table
(UDR) 0.0.0.0 -> NVA ILB IP
(System) 10.1.0.0/16 -> VNet Peering
(System) 10.3.0.0/16 -> Virtual Network

Region 2 Security Virtual Network Route Table
(BGP) 10.0.0.0/13 -> Virtual Network Gateway
(BGP) 10.1.0.0/16 -> Virtual Network Gateway
(BGP) 10.8.0.0/13 -> Virtual Network Gateway
(BGP) 192.168.0.0/24 -> Virtual Network Gateway
(BGP) 192.168.1.0/24 -> Virtual Network Gateway
(BGP) 192.168.2.0/24 -> Virtual Network Gateway
(BGP) 192.168.3.0/24 -> Virtual Network Gateway
(System) 10.8.0.0/16 -> VNet Peering
(System) 10.10.0.0/16 -> VNet Peering
(System) 10.11.0.0/16 -> VNet Peering
(System) 10.9.0.0/16 -> Virtual Network

Region 2 Security VNet Connection
Associated Route Table: defaultRouteTable
Propagating Route Tables:
Propagating Labels: default
Static Routes:
10.9.0.0/16 -> 10.9.0.100
10.10.0.0/16 -> 10.9.0.100
10.11.0.0/16 -> 10.9.0.100

Region 2 Workload Virtual Network 1 Route Table
(UDR) 0.0.0.0 -> NVA ILB IP
(System) 10.9.0.0/16 -> VNet Peering
(System) 10.10.0.0/16 -> Virtual Network

Region 2 Workload Virtual Network 2 Route Table
(UDR) 0.0.0.0 -> NVA ILB IP
(System) 10.9.0.0/16 -> VNet Peering
(System) 10.11.0.0/16 -> Virtual Network

Region 2 Default Route Table
Labels: default
Static Routes:
10.0.0.0/13 -> Region 1 Security VNet Connection
10.8.0.0/13 -> Region 2 Security VNet Connection
10.1.0.0/16 -> Remote Hub -> 65520 65520
10.9.0.0/16 -> Virtual Network Connection
192.168.0.0/24 -> Virtual Network Gateway -> 65501
192.168.1.0/24 -> Virtual Network Gateway -> 65502
192.168.2.0/24 -> Virtual Network Gateway -> 65503
192.168.3.0/24 -> Virtual Network Gateway -> 65504


That's all Folks!