# An Introduction to Azure Virtual WAN

Jake Walsh

*Please note – the views/opinions in this presentation are entirely my own.*
***If in any doubt, please check latest documentation and MS Links for updated info!***


# Hello!

**Jake Walsh**
Senior Solution Architect @ CDW UK

@jakewalsh90
jakewalsh.co.uk

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***If in any doubt, please check latest documentation and MS Links for updated info!***

# Agenda

- Overview
- Use Cases & Core Components
- Why use Azure Virtual WAN?
- Security
- Expansion
- Getting Started
- Demo Environment (Time Permitting!)
- Resources to help – to be shared in slides afterwards.

# What is Azure Virtual WAN?

- Azure Virtual WAN is a **Networking Service** that brings various elements together in a single operational interface.

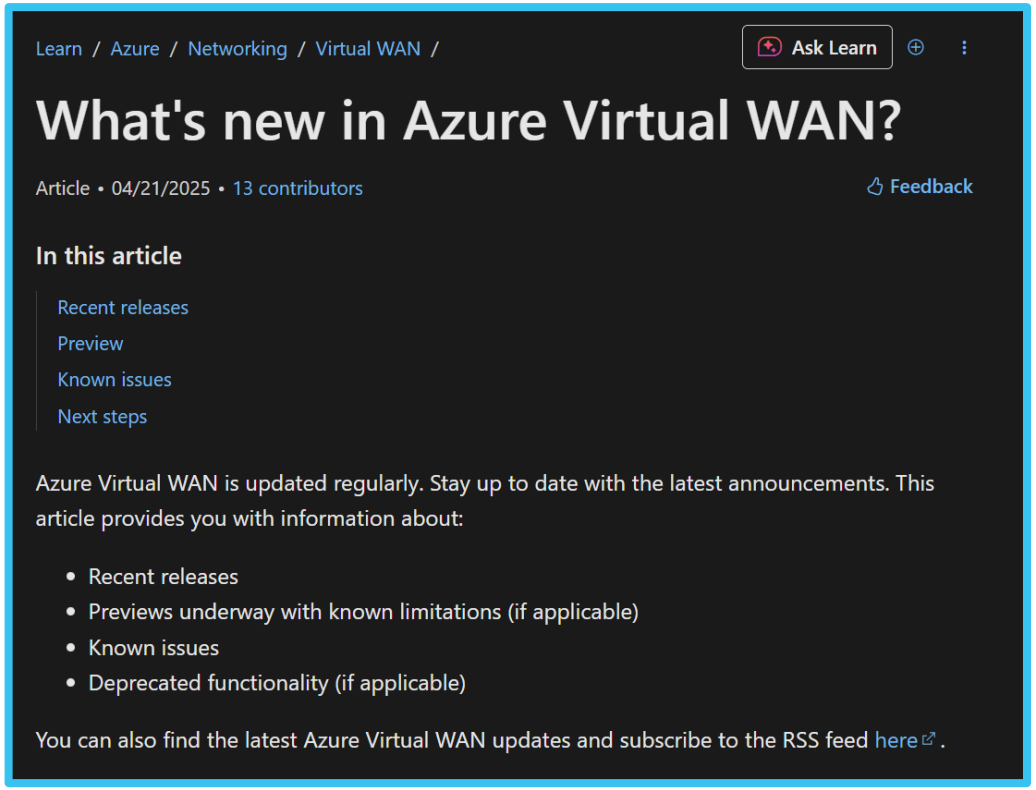
- Key Features Include:
  - Automated large-scale branch connectivity
  - Unified network and policy management
  - Optimised routing thanks to the Microsoft Global Network

# What is Azure Virtual WAN?

Azure Virtual WAN is a **Networking Service** that brings various aspects together in a single Azure Service:

| | | | |
|---|---|---|---|
| Hub / Spoke – replaced with Virtual WAN Hub and VNET Peering to Spokes | Routing and Route Tables – Automated | VPNs/ExpressRoute – Centralised Management | Firewalling – Azure native options and 3rd Party NVAs |

# Always improving...



Learn / Azure / Networking / Virtual WAN / Ask Learn

## What's new in Azure Virtual WAN?

Article • 04/21/2025 • 13 contributors Feedback

**In this article**

- Recent releases
- Preview
- Known issues
- Next steps

Azure Virtual WAN is updated regularly. Stay up to date with the latest announcements. This article provides you with information about:

- Recent releases
- Previews underway with known limitations (if applicable)
- Known issues
- Deprecated functionality (if applicable)

You can also find the latest Azure Virtual WAN updates and subscribe to the RSS feed here.

## Routing

Expand table

| Type | Area | Name | Description | Date added | Limitations |
|---|---|---|---|---|---|
| Feature | Routing | Route-maps | General Availability of Route-maps. Route-maps is a feature that gives you the ability to control route advertisements and routing for Virtual WAN virtual hubs. | April 2025 | Known limitations |
| Metric | Routing | New Virtual hub metrics | There are now two new Virtual WAN hub metrics that display the virtual hub's capacity and spoke Virtual Machine (VM) utilization: **Routing Infrastructure Units** and **Spoke VM Utilization**. | August 2024 | The **Spoke VM Utilization** metric represents an approximate number of deployed spoke VMs as a percentage of the total number of spoke VMs that the hub's routing infrastructure units can support. |

https://learn.microsoft.com/en-us/azure/virtual-wan/whats-new

# Where is Virtual WAN available?

| Geopolitical region | Azure regions |
|---|---|
| Australia Government | Australia Central, Australia Central 2 |
| Europe | France Central, France South, Germany North, Germany West Central, North Europe, Norway East, Switzerland North, Switzerland West, West Europe, UK West, UK South |
| North America | East US, West US, East US 2, West US 2, Central US, South Central US, North Central US, West Central US, Canada Central, Canada East |
| Asia | East Asia, Southeast Asia |
| India | India West, India Central, India South |
| Japan | Japan West, Japan East |
| Oceania | Australia Southeast, Australia East |
| South Africa | South Africa North, South Africa West |
| South America | Brazil South |
| South Korea | Korea Central, Korea South |
| UAE | UAE North, UAE Central |

| Geopolitical region | Azure regions |
|---|---|
| US Government cloud | US Gov Arizona, US Gov Iowa, US Gov Texas, US Gov Virginia, US DoD Central, US DoD East |
| China East | China East2 |
| China North | China North2 |

- Most Azure Public Regions – some limitations around Reserved Access
- US Government and Azure China also available
- Availability Zones – key consideration

https://learn.microsoft.com/en-us/azure/virtual-wan/virtual-wan-locations-partners

https://azure.microsoft.com/en-us/explore/global-infrastructure/products-by-region/table

# Use Cases

- The key aspect – **Bringing together** core networking features:

  - Branch connectivity – route your branch to branch traffic via Microsoft's Network.
  - Site-to-site VPN connectivity.
  - Remote user VPN connectivity (point-to-site).
  - Private connectivity (ExpressRoute).
  - Intra-cloud connectivity (transitive connectivity for virtual networks).
  - VPN ExpressRoute inter-connectivity.
  - Routing Configuration – Route Tables, Custom Routing etc.
  - Azure Firewall & Firewall Manager integration
  - Transit & Internal Connectivity – Hub/Hub/Spoke/Spoke

# Virtual WAN is like a buffet...

Virtual WAN provides many services – you can choose which you want to use.

Some organisations will use many, others will use only a few.

Some will go back for a second helping!

# Two SKUs

| Virtual WAN type | Hub type | Available configurations |
|---|---|---|
| Basic | Basic | Site-to-site VPN only |
| Standard | Standard | ExpressRoute<br>User VPN (P2S)<br>VPN (site-to-site)<br>Inter-hub and VNet-to-VNet transiting through the virtual hub<br>Azure Firewall<br>NVA in a virtual WAN |

**Note**

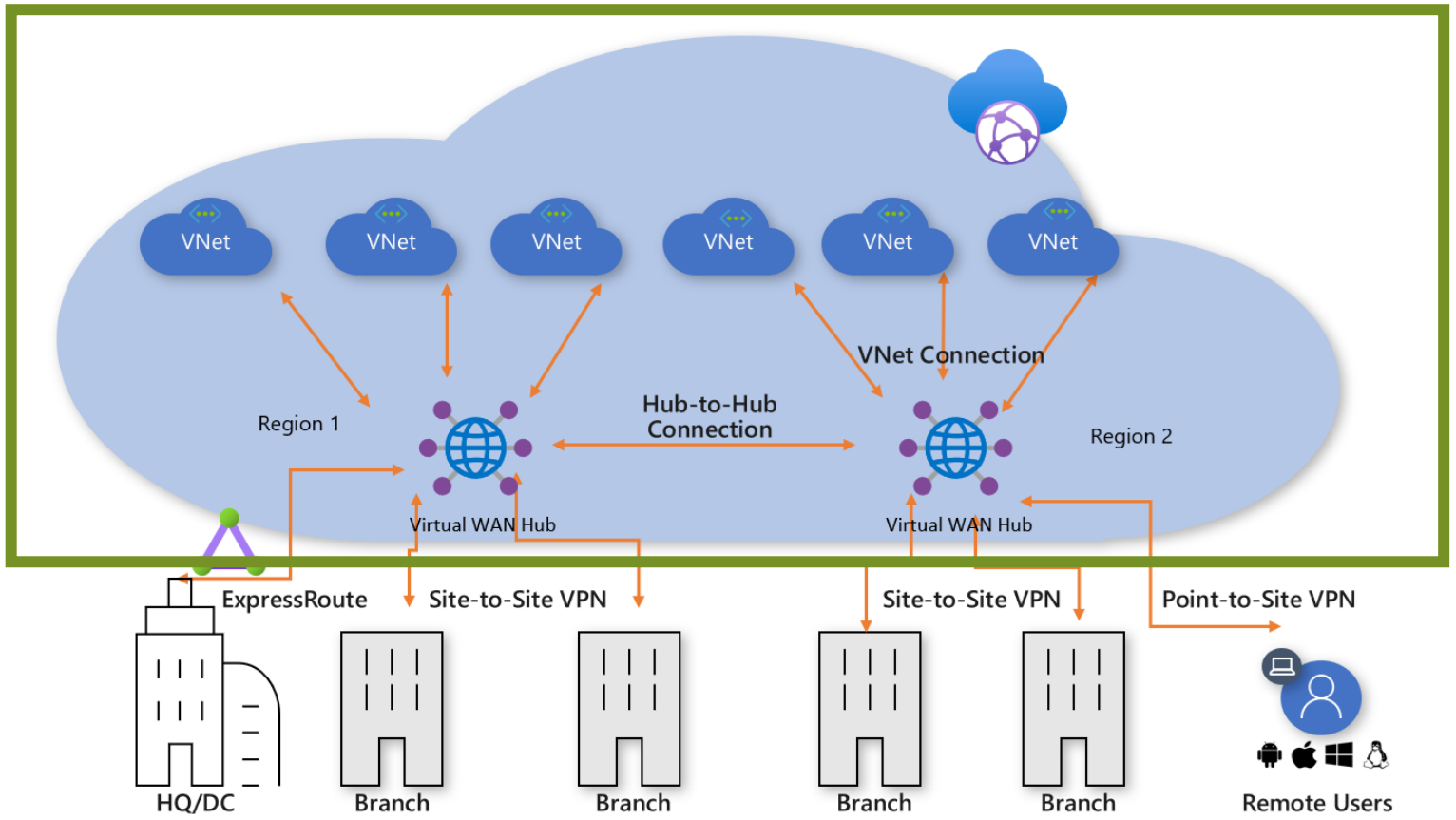
You can upgrade from Basic to Standard, but can't revert from Standard back to Basic.

https://learn.microsoft.com/en-us/azure/virtual-wan/virtual-wan-about

# Core Components

- 5 Key Virtual WAN components you will likely use in all deployments that span **more than 1 Azure Region**:
  - Virtual WAN
  - Hub
  - **Hub to Hub Connection**
  - Hub Virtual Network Connection
  - Hub Route Table

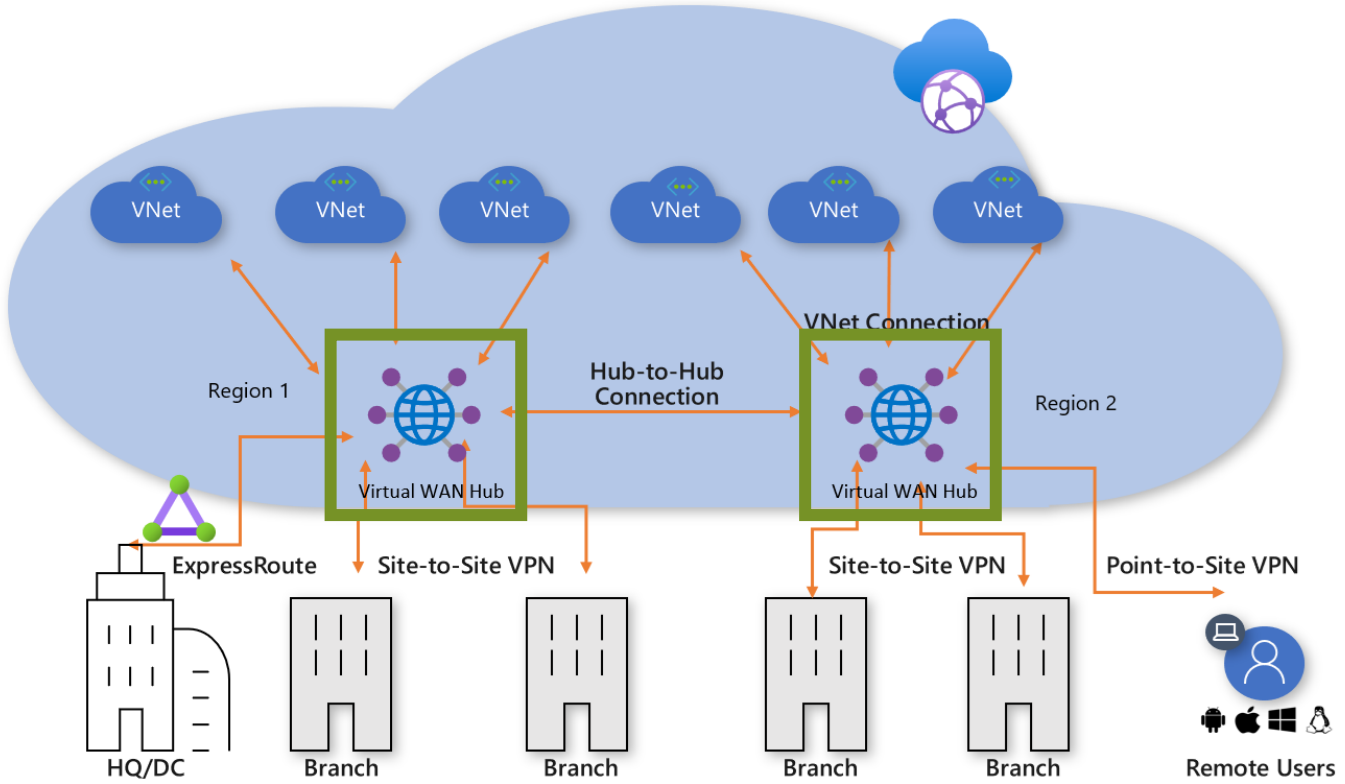
# Virtual WAN




- Virtual overlay of your Azure Networking
- A collection of multiple Resources
- Contains all Virtual WAN components within your topology
- The point of administration for your Virtual WAN deployment.

# Hub

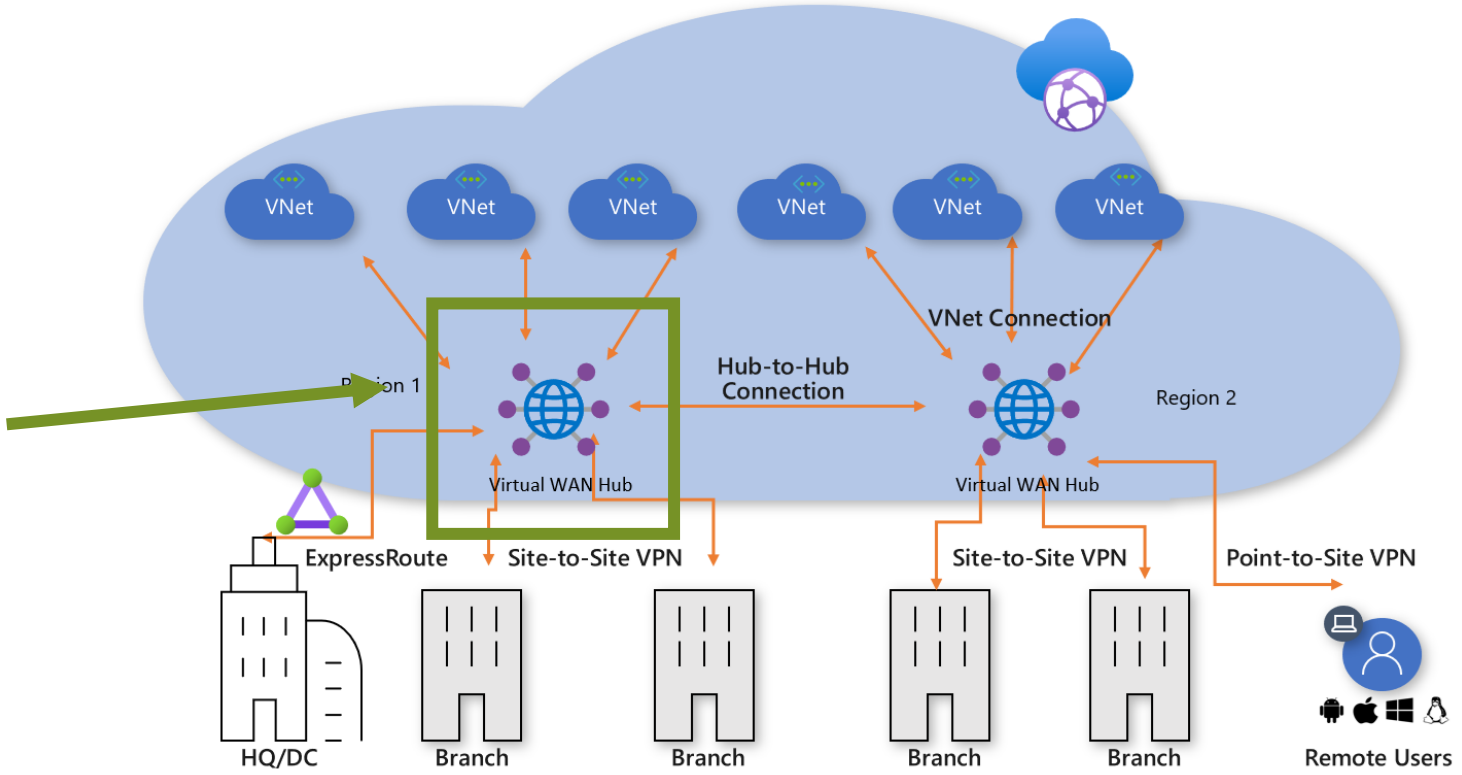
- The Virtual Hub is a Microsoft Managed Virtual Network, containing various service endpoints.
- The Hub is the Core of the Virtual WAN network in an Azure Region. Typically 1 Hub per Region but can be more.
- Gateways for VPN/ExpressRoute deployed within Hubs.
- Firewalls / NVAs deployed into Hubs.
- Note – consider routing units!



# What's in the Hub?

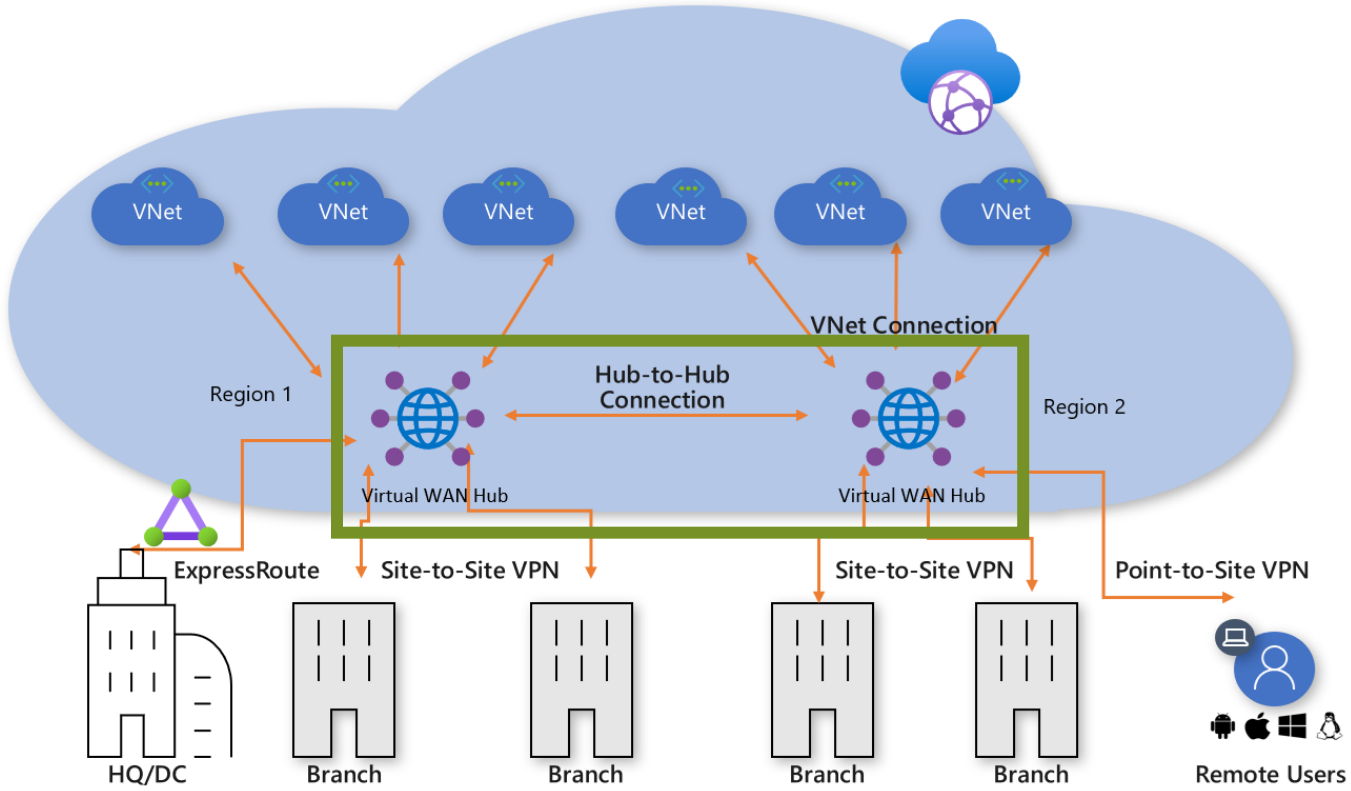
Items we can deploy into a Hub:

- Virtual Network Gateway
- ExpressRoute Gateway
- P2S Gateway
- Azure Firewall or NVA
- Route Tables
- Hub to Hub Connection



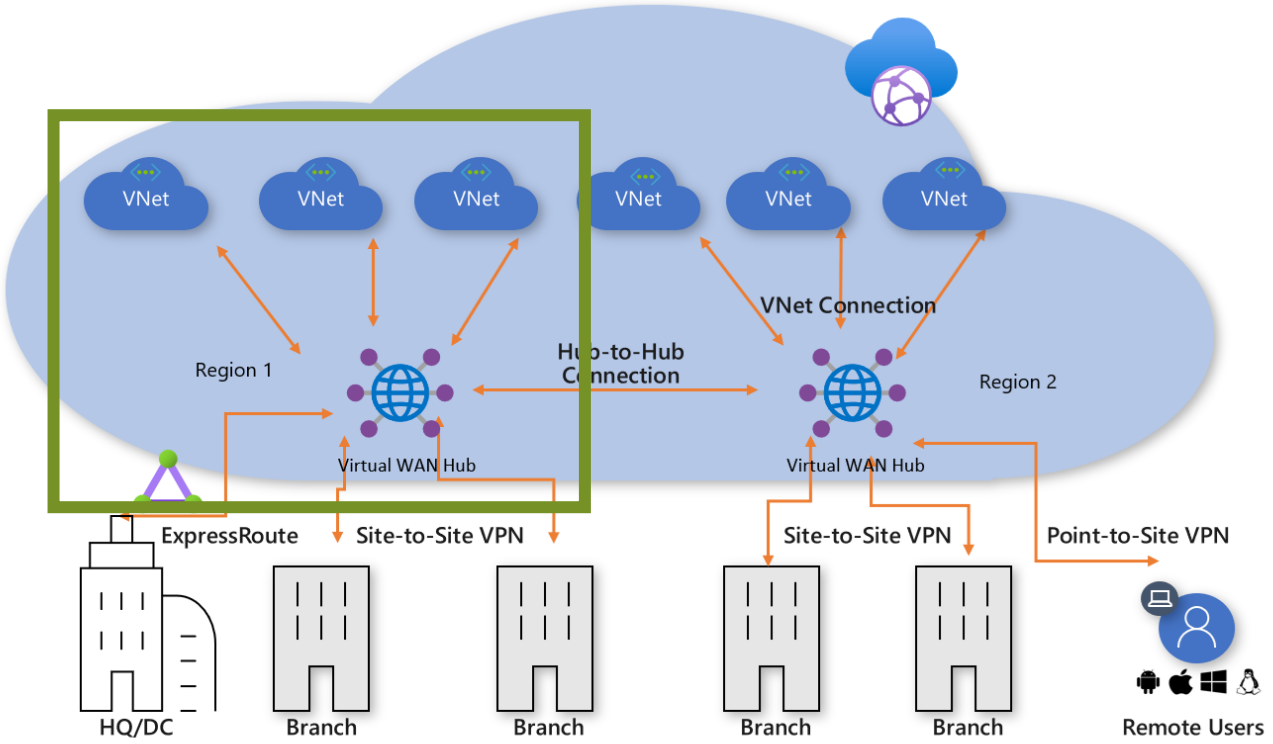
# Hub to Hub Connection

- Virtual WAN Hubs are connected within a Virtual WAN.
- Hubs can communicate freely and routing is propagated.
- Inter-Region connectivity is established using Virtual WAN Hubs.
- Connectivity can be controlled using a Firewall or NVA.



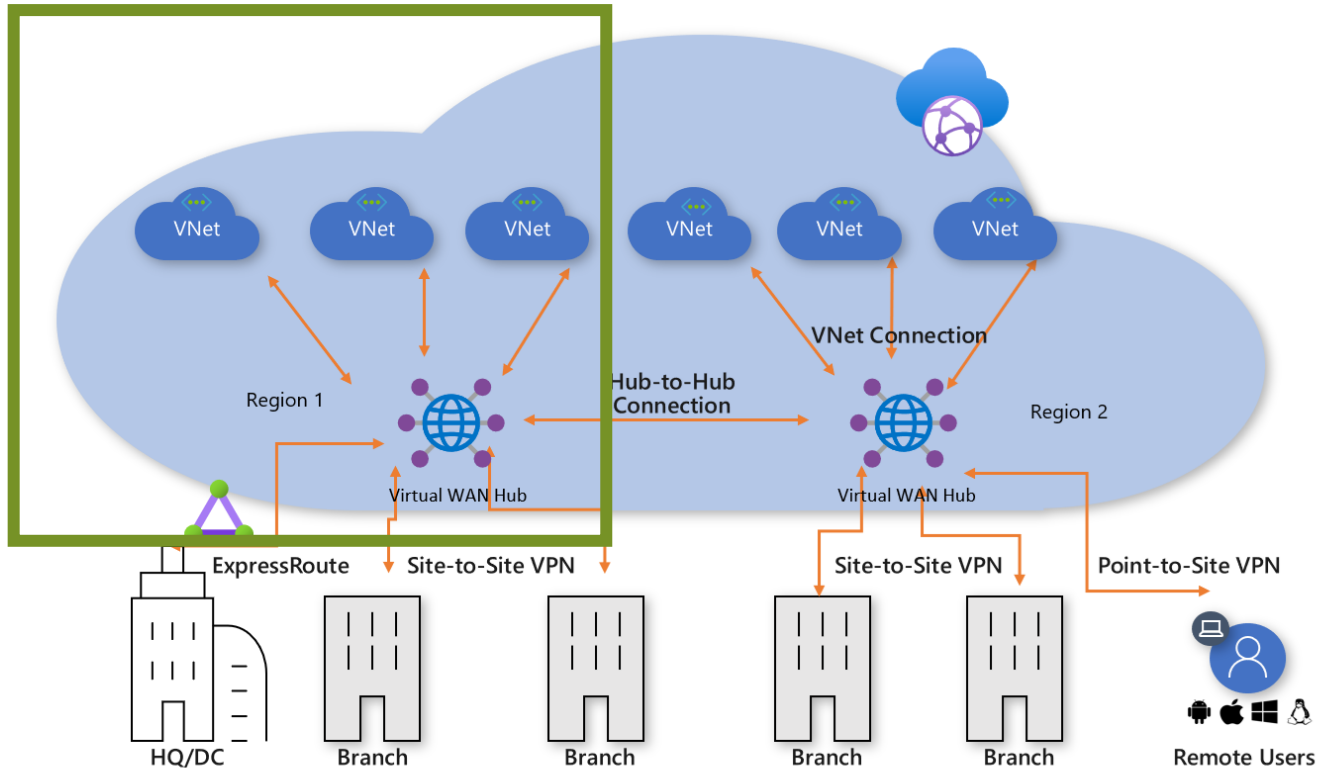
# Hub Virtual Network Connection

- A Hub Virtual Network connection joins a spoke network to a Virtual WAN Hub.
- A Virtual Network can be connected to a single Virtual WAN hub.
- Traffic is enabled between the Virtual WAN Hub and Spoke Virtual Network.
- Azure Firewall or an NVA is used in many cases to control this traffic.



# Hub Route Table

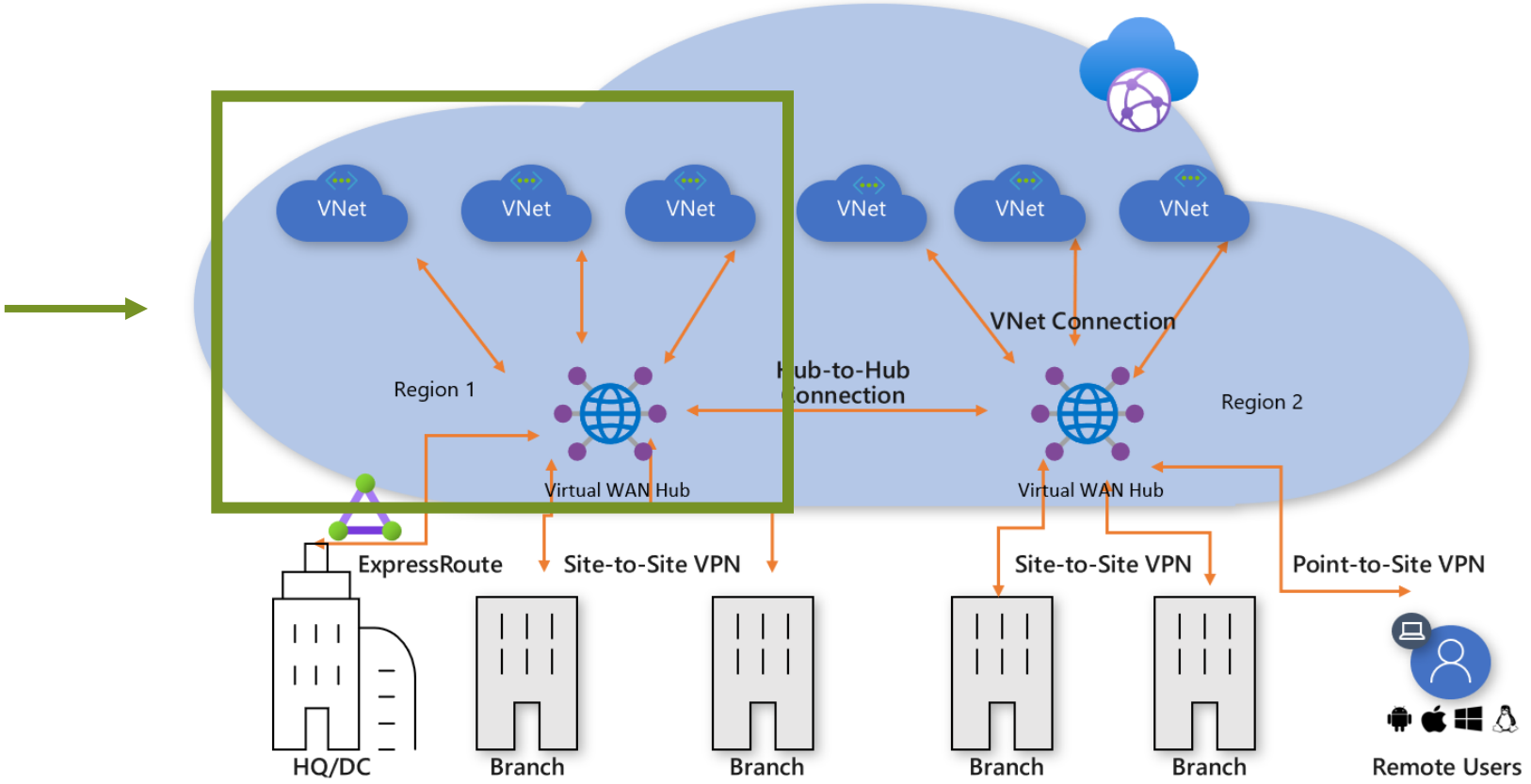
- Each Hub has its own default route table. This can be edited to add static routes if required.
- Static routes take precedence over dynamic routes.
- Associated with a Hub and it's connected Virtual Networks.
- Connections, e.g. VPN, ExpressRoute or PS2 will also have a routing configuration that propagates to a route table.
- Labels can be used to logically group route tables.




https://learn.microsoft.com/en-us/azure/virtual-wan/about-virtual-hub-routing#considerations

# What about Hub and Spoke?

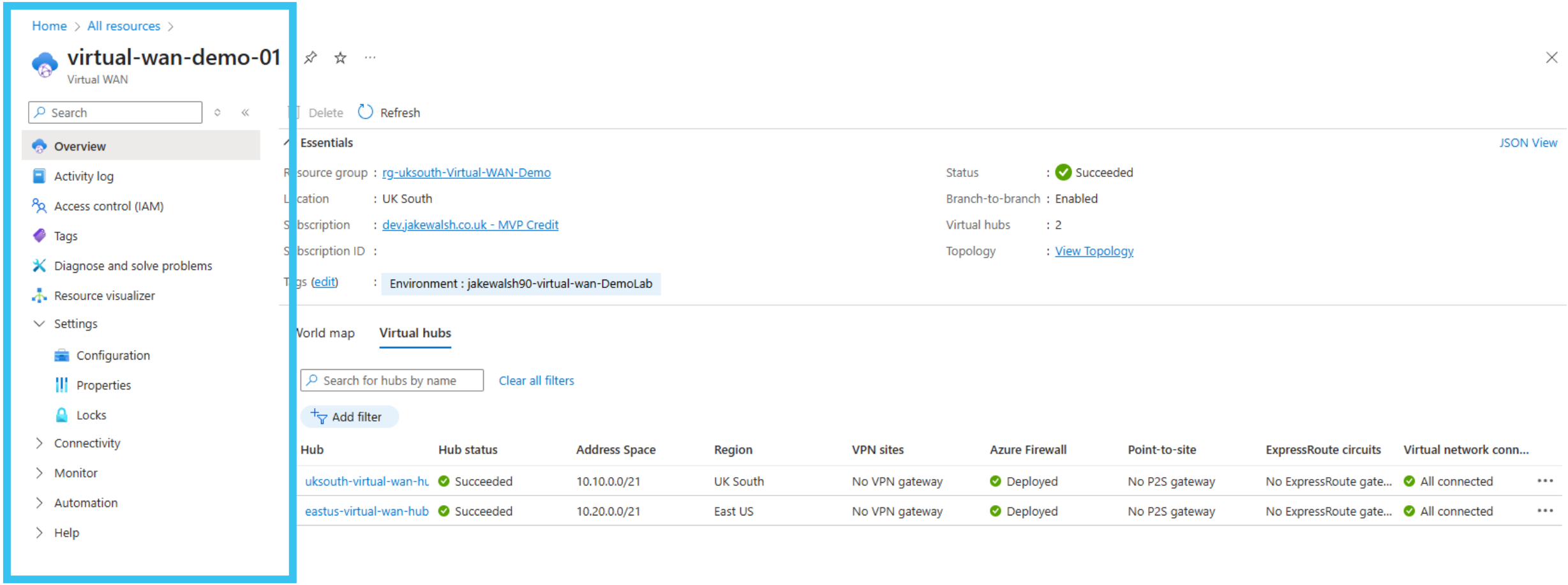
- Virtual WAN replaces an existing Hub Spoke architecture with Spoke VNETs peered into a Virtual WAN Hub.
- Hubs become fully managed by Virtual WAN.
- Central management of all Hubs in the topology.
- All Spokes peer into a Virtual WAN Hub, with connectivity and inter-region traffic routed via the Hub.



# Why Virtual WAN? Core Benefits:

- **An Integrated Solution –** All core networking aspects in a single control Resource. Site to Site and Connectivity options are easily accessed and managed. **Simple administration!**
- **An Automated Solution –** Connect Virtual Networks to the Hubs easily, and also bring additional services into Virtual WAN with ease – again, centralised, simplified and automated is the key.
- **Troubleshooting –** End to End visibility, allowing rapid diagnosis of issues and simple troubleshooting.
- **Centralised Control –** A centralised service that brings core networking together, removing the need to configure and manage multiple separate resources.
- **Firewalling –** Integrations to Azure Firewall, Azure Firewall Manager, and NVA options.
- **Rapid Expansion –** Simple expansion to other Regions, with automated routing and simplified connectivity via the Global Transit Architecture.

**An Integrated Solution –** All core networking aspects in a single control Resource. Site to Site and Connectivity options are easily accessed and managed. **Simple administration!**



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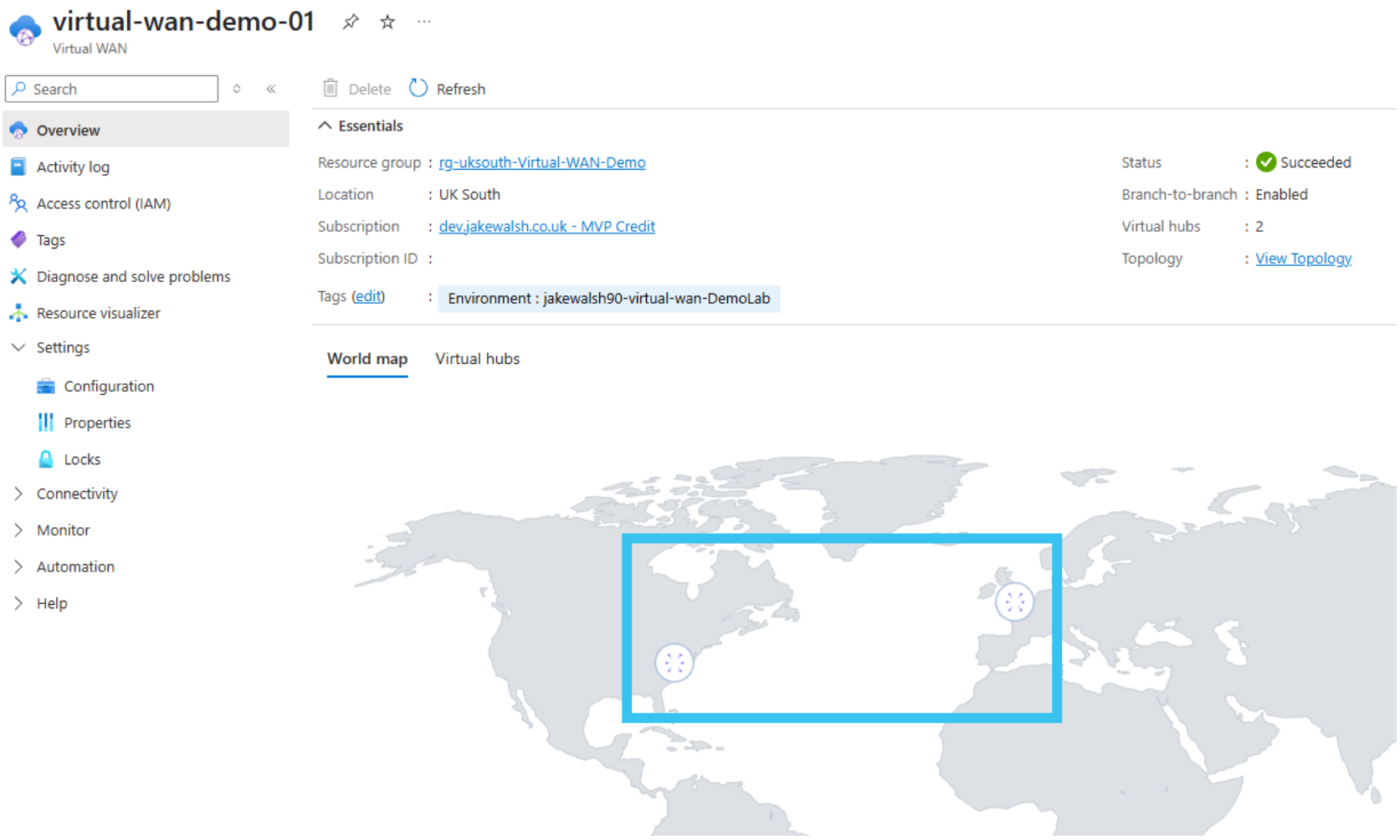

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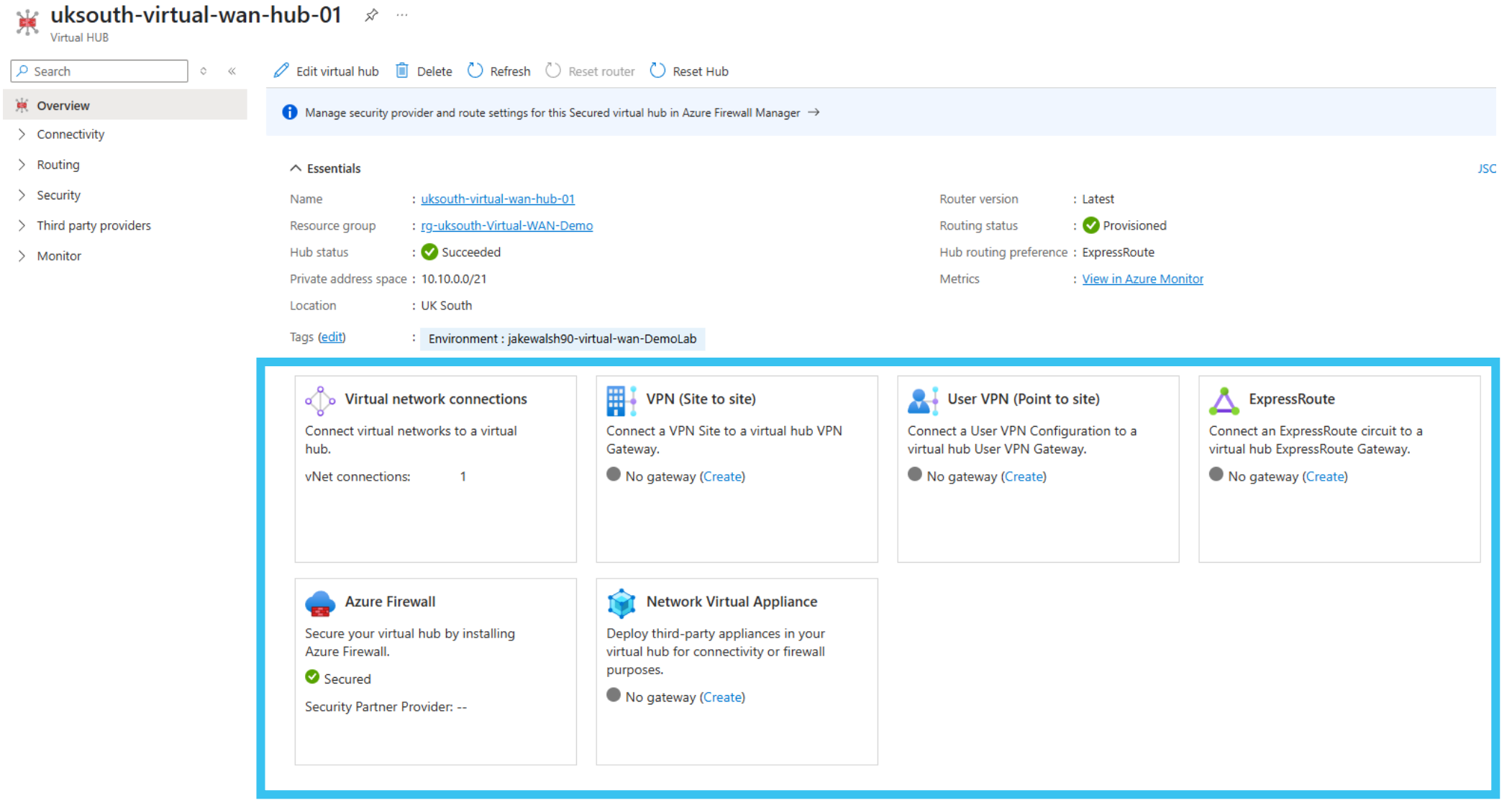
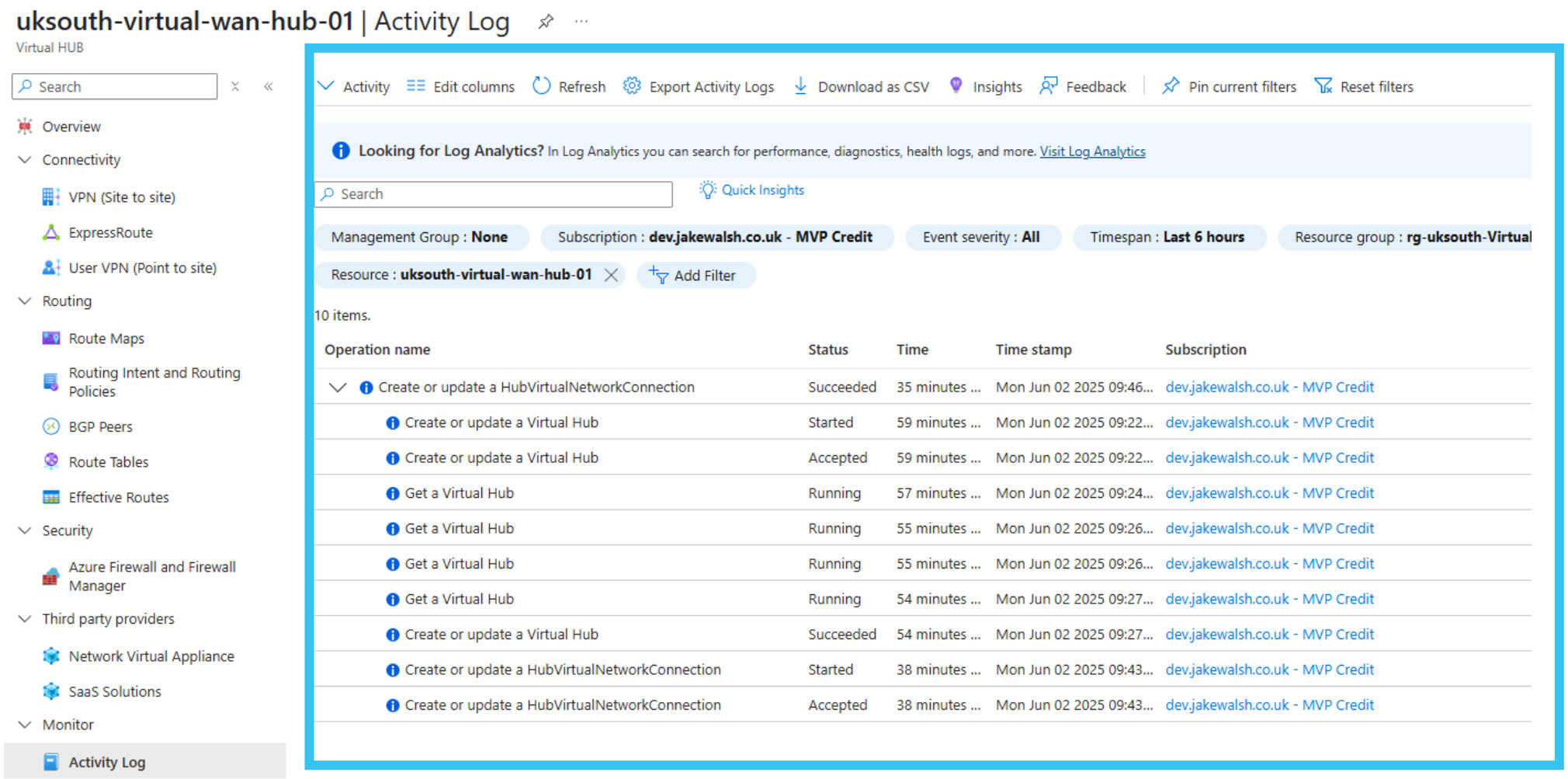


**Troubleshooting –** End to End visibility, logging, and rapid diagnosis of issues and simple troubleshooting.



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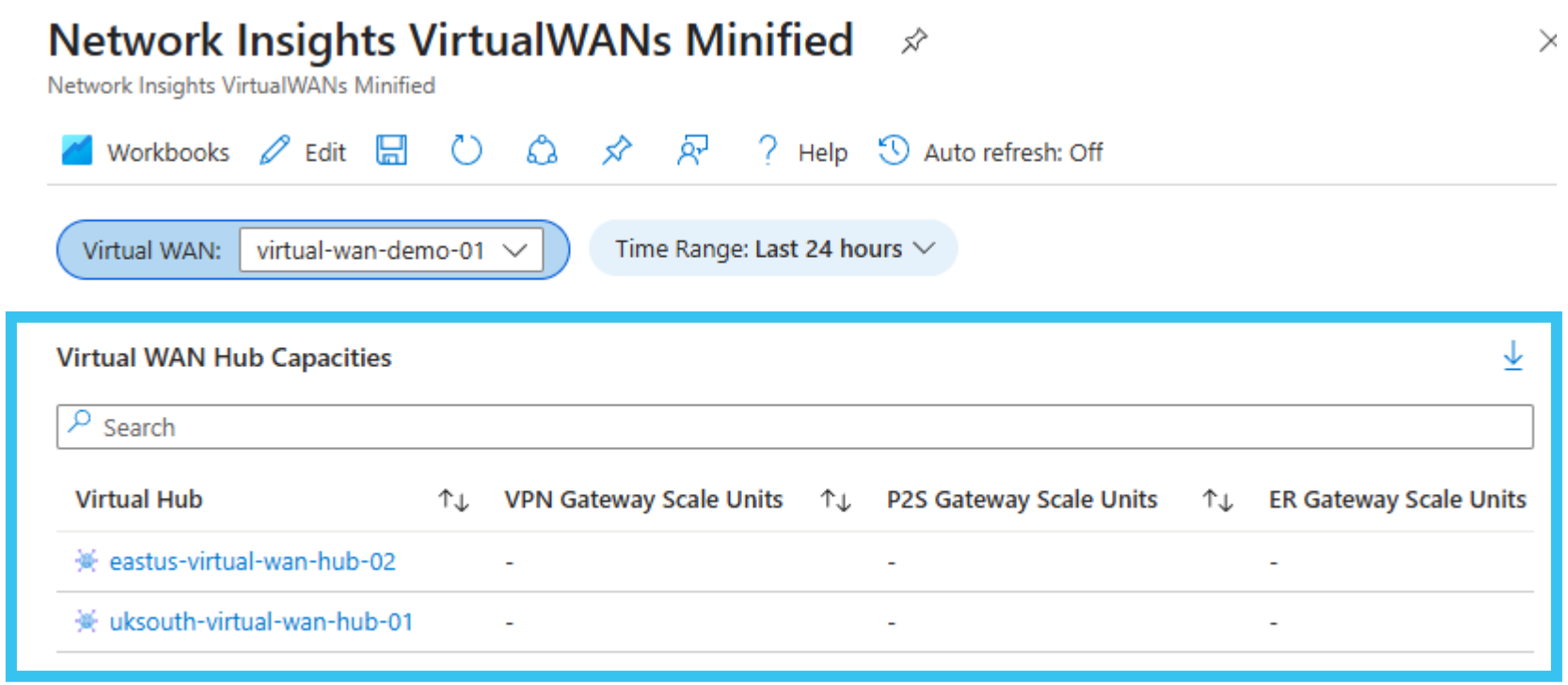

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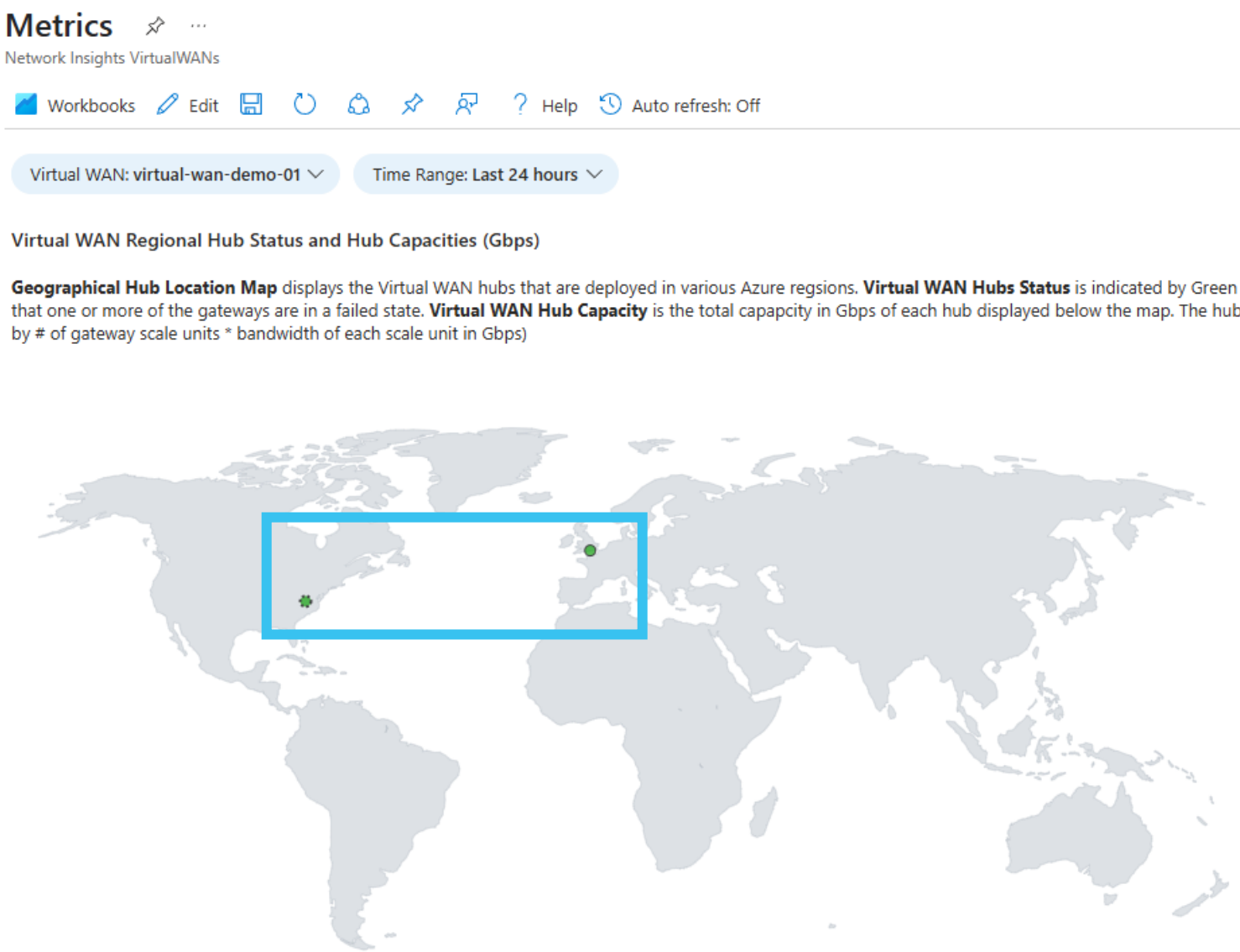

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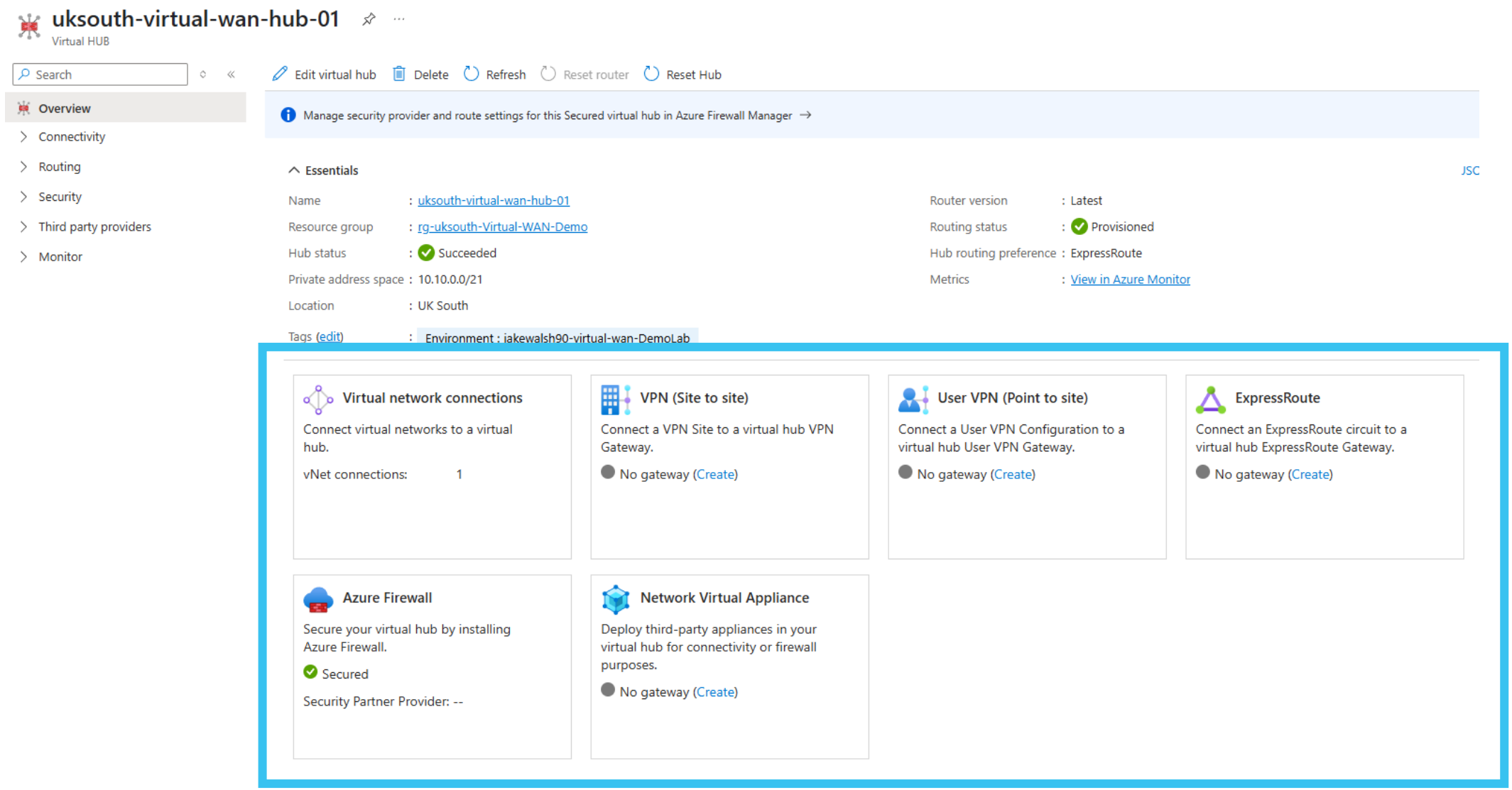

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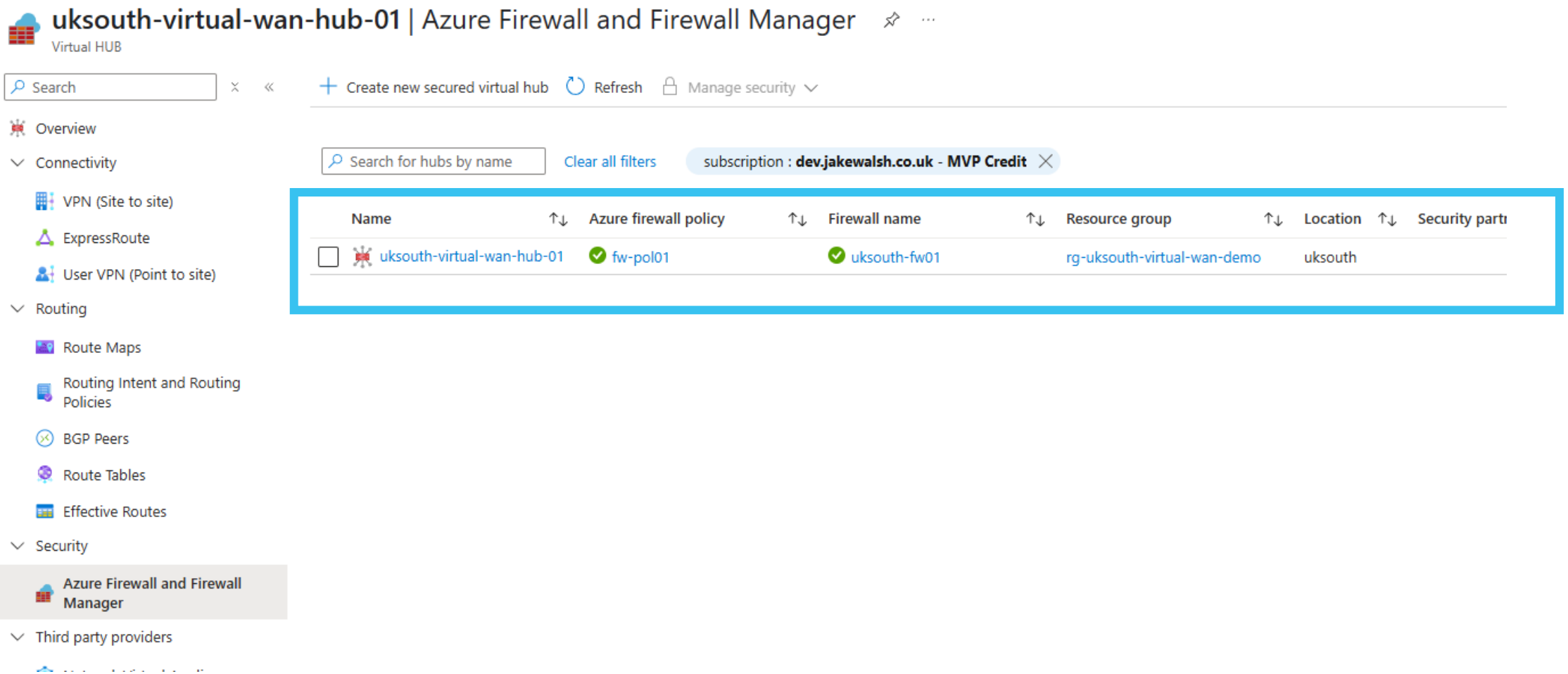

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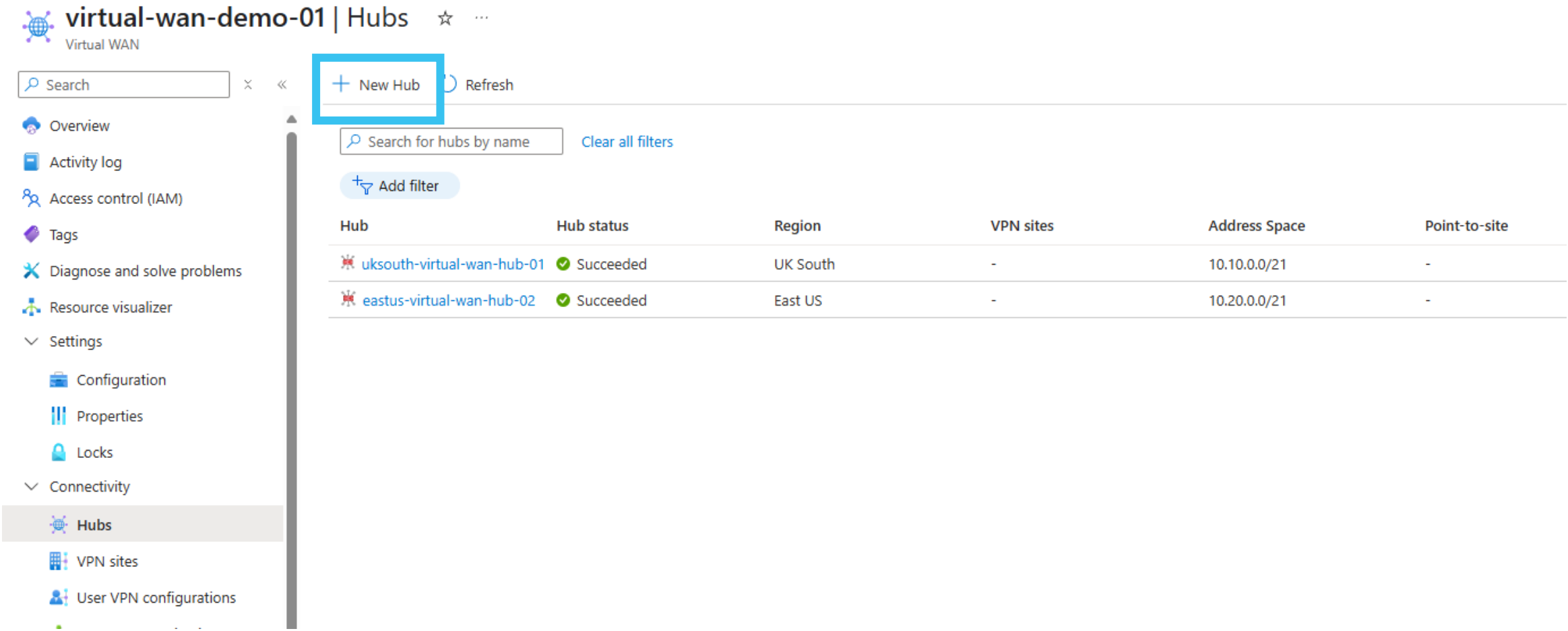
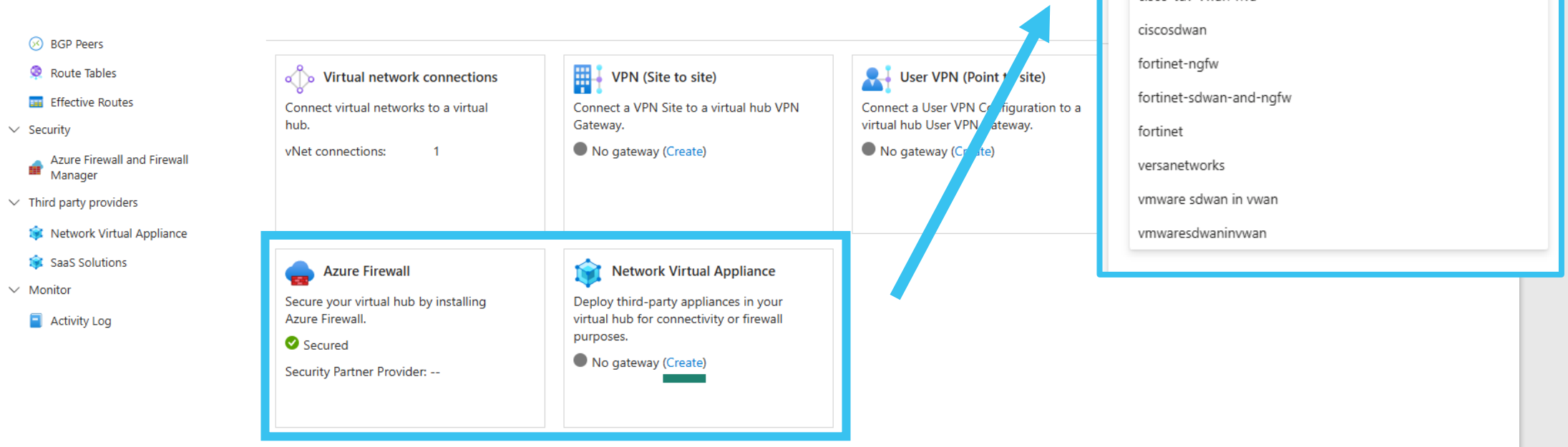


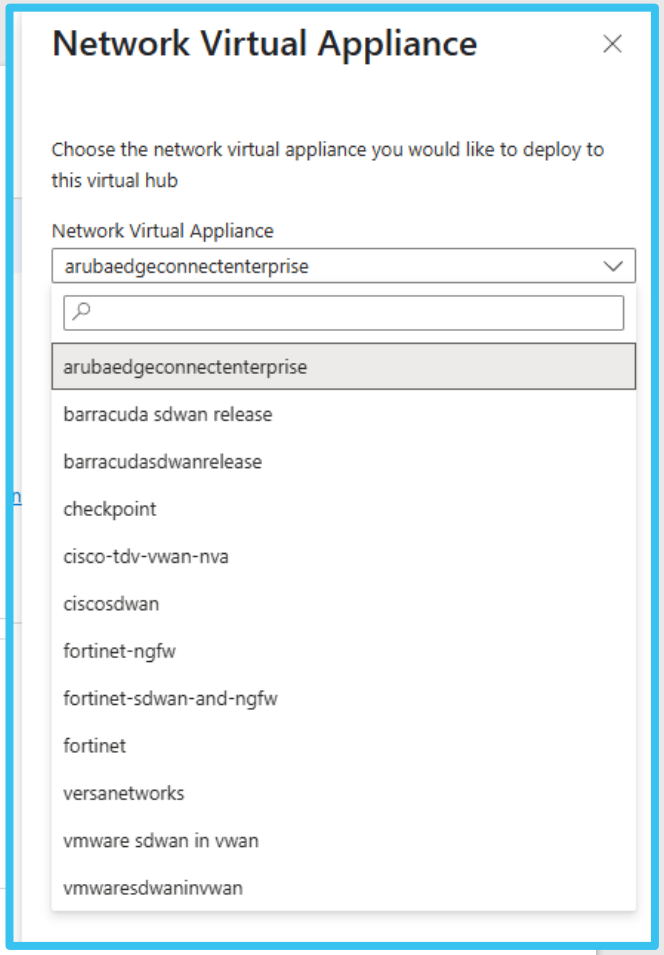
# Security Options

- There are numerous security aspects within Azure Virtual WAN – I'll cover a few key aspects today (there is **far** too much to cover on security in just this session!):
  - Azure Firewall, NVA, SaaS Options
  - Monitoring
  - Administration
  - Azure Security Baseline for Virtual WAN

# Azure Firewall, SaaS, and NVA Options

- Virtual WAN supports Azure Firewall, SaaS, and NVA options via supported vendors
- NVAs = Deployment Process
- Azure Firewall – convert Standard to Secured Hub




SAAS Offering: https://learn.microsoft.com/en-us/azure/virtual-wan/how-to-palo-alto-cloud-ngfw

# Azure Firewall and NVA Options

- Pre-defined and pre-tested selection of infrastructure choices (NVA Infrastructure Units)
- Built-in availability and resiliency
- No-hassle provisioning and boot-strapping
- Simplified routing
- Integrated support
- Optional platform-provided lifecycle management
- Integrated with platform features

https://learn.microsoft.com/en-us/azure/virtual-wan/about-nva-hub

# Azure Firewall and NVA Options

The following SD-WAN connectivity Network Virtual Appliances can be deployed in the Virtual WAN hub.

Expand tab

| Partners | Virtual WAN NVA Vendor Identifier | Configuration/How-to/Deployment guide | Dedicated support model |
|---|---|---|---|
| Barracuda Networks | barracudasdwanrelease | Barracuda SecureEdge for Virtual WAN Deployment Guide | Yes |
| Cisco SD-WAN | ciscosdwan | The integration of the Cisco SD-WAN solution with Azure virtual WAN enhances Cloud OnRamp for Multi-Cloud deployments and enables configuring Cisco Catalyst 8000V Edge Software (Cisco Catalyst 8000V) as a network virtual appliance (NVA) in Azure Virtual WAN hubs. View Cisco SD-WAN Cloud OnRamp, Cisco IOS XE Release 17.x configuration guide | Yes |
| VMware SD-WAN | vmwaresdwaninvwan | VMware SD-WAN in Virtual WAN hub deployment guide. The managed application for deployment can be found at this Azure Marketplace link. | Yes |
| Versa Networks | versanetworks | If you're an existing Versa Networks customer, log on to your Versa account and access the deployment guide using the following link Versa Deployment Guide. If you're a new Versa customer, sign-up using the Versa preview sign-up link. | Yes |
| Aruba EdgeConnect | arubaedgeconnectenterprise | Aruba EdgeConnect SD-WAN deployment guide. **Currently in Preview:** Azure Marketplace link | No |

| Partners | Virtual WAN NVA Vendor | Configuration/How-to/Deployment guide | Dedicated support model |
|---|---|---|---|
| Check Point CloudGuard Network Security for Azure Virtual WAN | checkpoint | Check Point Network Security for Virtual WAN deployment guide | No |
| Fortinet Next-Generation Firewall (NGFW) | fortinet-ngfw | Fortinet NGFW deployment guide. Fortinet NGFW supports up to 80 scale units and isn't recommended to be used for SD-WAN tunnel termination. For Fortigate SD-WAN tunnel termination, see Fortinet SD-WAN and NGFW documentation. | No |
| Cisco Secure Firewall Threat Defense for Azure Virtual WAN | cisco-tdv-vwan-nva | Cisco Secure Firewall Threat Defense for Azure Virtual WAN for Virtual WAN deployment guide | No |

The following dual-role SD-WAN connectivity and security (Next-Generation Firewall) Network Virtual Appliances can be deployed in the Virtual WAN hub. These Virtual Appliances can be used to inspect all North-South, East-West, and Internet-bound traffic.

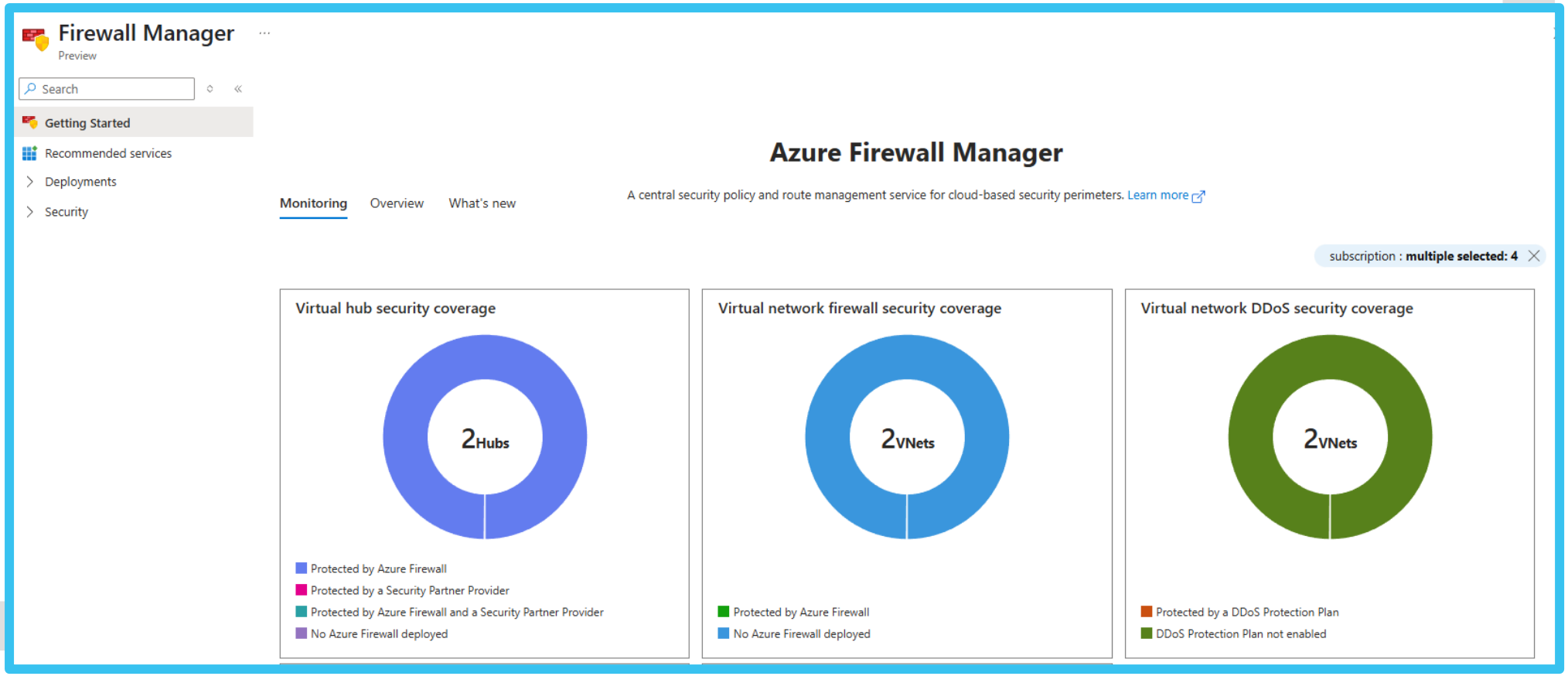
Expand table

| Partners | Virtual WAN NVA Vendor | Configuration/How-to/Deployment guide | Dedicated support model |
|---|---|---|---|
| Fortinet Next-Generation Firewall (NGFW) | fortinet-sdwan-and-ngfw | Fortinet SD-WAN and NGFW NVA deployment guide. Fortinet SD-WAN and NGFW NVA support up to 20 scale units and supports both SD-WAN tunnel termination and Next-Generation Firewall capabilities. | No |

https://learn.microsoft.com/en-us/azure/virtual-wan/about-nva-hub#partners

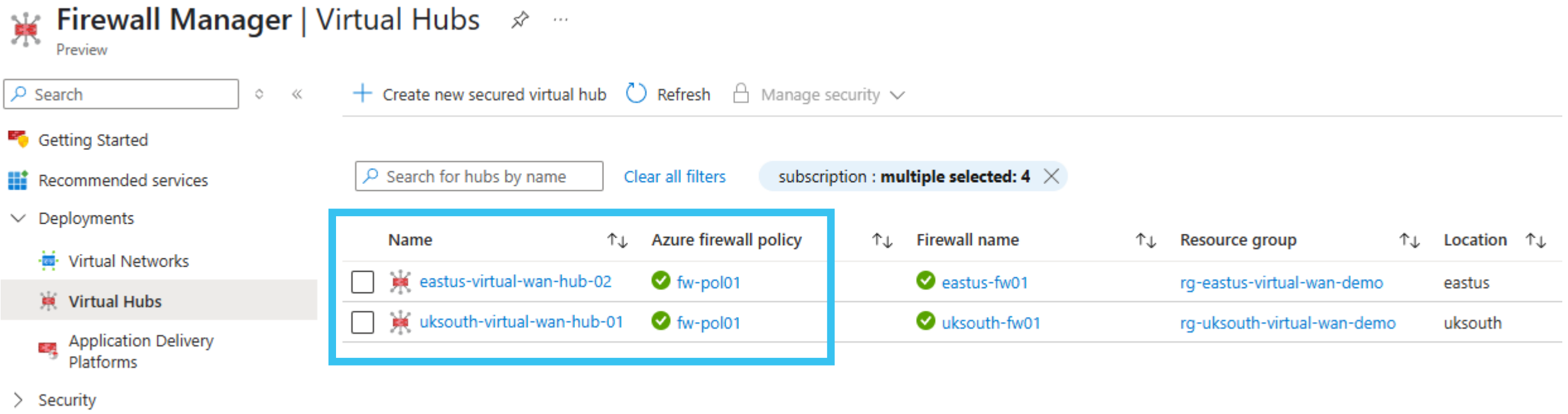
# Azure Firewall!

- Azure Firewall provides an Azure Native Firewall option that can be controlled and Managed using Azure Firewall Manager



# Azure Firewall

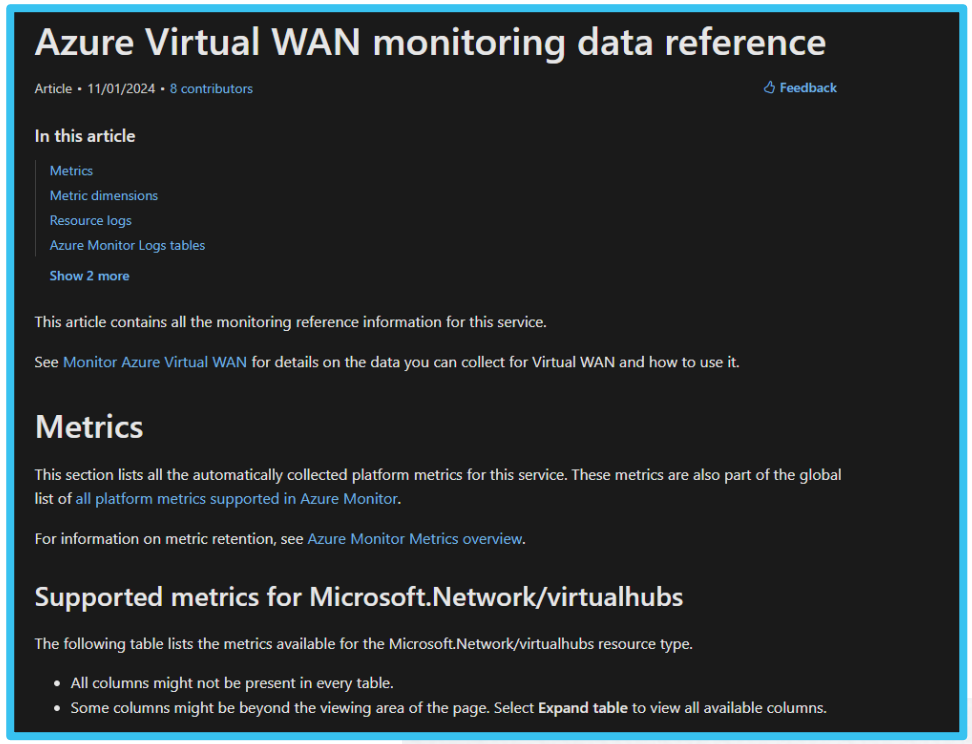
- Central Hub Management and Policy control:




https://learn.microsoft.com/en-us/azure/virtual-wan/howto-firewall

# Monitoring – the importance of Metrics!

- Like many Azure Services – Virtual WAN has a huge range of Metrics you can monitor.
- The Azure Virtual WAN monitoring data reference is the guide to these metrics.



## Azure Virtual WAN monitoring data reference

Article • 11/01/2024 • 8 contributors

Feedback

**In this article**

- Metrics
- Metric dimensions
- Resource logs
- Azure Monitor Logs tables

Show 2 more

This article contains all the monitoring reference information for this service.

See Monitor Azure Virtual WAN for details on the data you can collect for Virtual WAN and how to use it.

### Metrics

This section lists all the automatically collected platform metrics for this service. These metrics are also part of the global list of all platform metrics supported in Azure Monitor.

For information on metric retention, see Azure Monitor Metrics overview.

### Supported metrics for Microsoft.Network/virtualhubs

The following table lists the metrics available for the Microsoft.Network/virtualhubs resource type.

- All columns might not be present in every table.
- Some columns might be beyond the viewing area of the page. Select **Expand table** to view all available columns.

## Category: Traffic

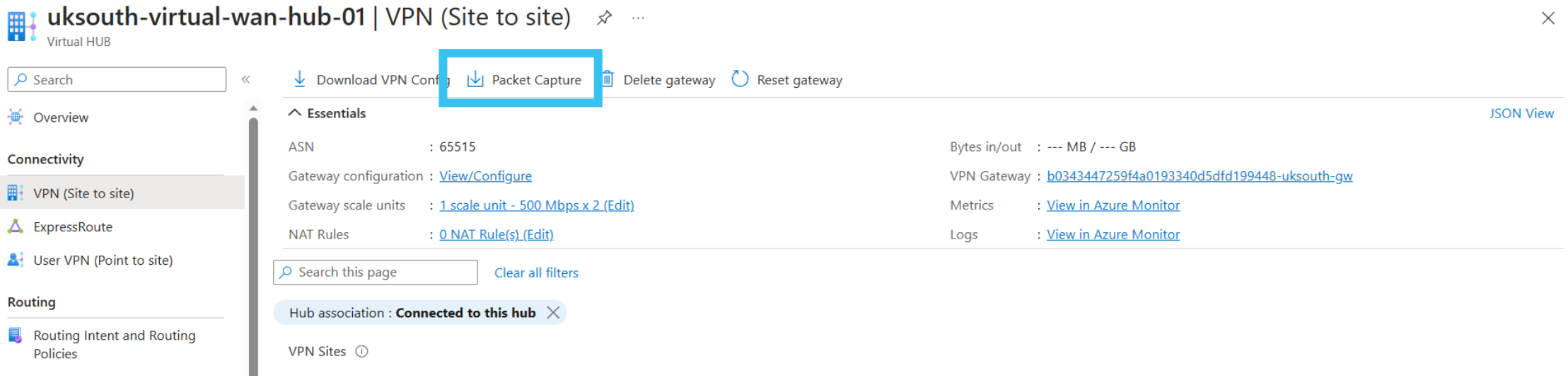
Expand table

| Metric | Name in REST API | Unit | Aggregation | Dimensions | Time Grains | DS Export |
|---|---|---|---|---|---|---|
| **Gateway S2S Bandwidth**<br>Site-to-site bandwidth of a gateway in bytes per second | `AverageBandwidth` | BytesPerSecond | Average | `Instance` | PT5M, PT15M, PT30M, PT1H, PT6H, PT12H, P1D | Yes |
| **Gateway Inbound Flows**<br>Number of 5-tuple flows entering into a VPN gateway | `InboundFlowsCount` | Count | Maximum, Minimum | `Instance` | PT5M, PT15M, PT30M, PT1H, PT6H, PT12H, P1D | Yes |
| **Gateway Outbound Flows**<br>Number of 5-tuple flows exiting a VPN gateway | `OutboundFlowsCount` | Count | Maximum, Minimum | `Instance` | PT5M, PT15M, PT30M, PT1H, PT6H, PT12H, P1D | Yes |
| **Tunnel Bandwidth**<br>Average bandwidth of a tunnel in bytes per second | `TunnelAverageBandwidth` | BytesPerSecond | Average | `ConnectionName`, `RemoteIP`, `Instance` | PT5M, PT15M, PT30M, PT1H, PT6H, PT12H, P1D | Yes |
| **Tunnel Egress Bytes** | `TunnelEgressBytes` | Bytes | Total (Sum) | `ConnectionName`, `RemoteIP`, `Instance` | PT5M, PT15M, PT30M, | Yes |

https://learn.microsoft.com/en-us/azure/virtual-wan/monitor-virtual-wan-reference#metrics

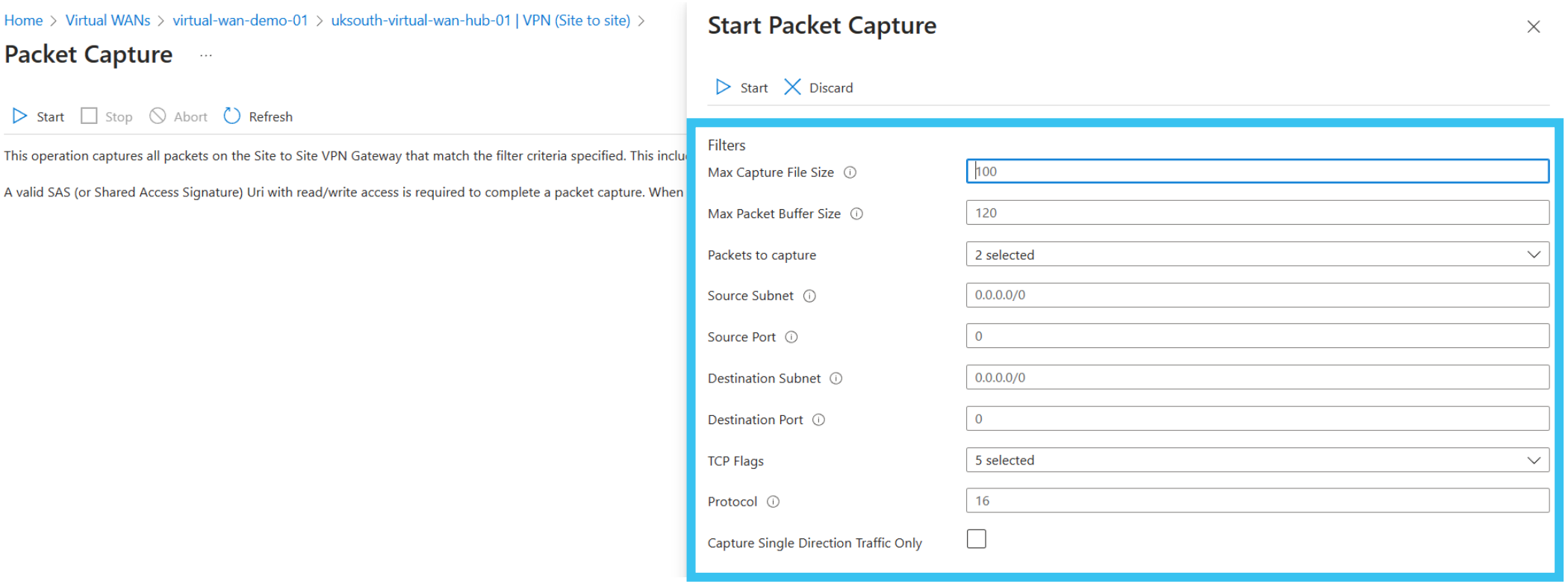
# Packet Capture – available for S2S VPNs

- Requires a Virtual WAN and Hub, with a S2S VPN Gateway deployed.
- Logs captures to a Storage Account Container
- Supports optional filters, e.g. TCPFlags or MaxFileSize




https://learn.microsoft.com/en-us/azure/virtual-wan/packet-capture-site-to-site-portal

# Packet Capture – available for S2S VPNs



# Administration – obvious, but relevant…

- Centralised Cloud Network - use Entra ID credentials for Administration
- Entra ID means PIM / MFA etc.
- No need for a jump host or Bastion to administrate network appliances or systems.
- Management via ARM / Azure Portal
- DevOps Integration – Networking Configuration as Code

# Azure Security Baseline – a worthwhile read!

## Azure security baseline for Virtual WAN

Article • 02/25/2025 • 1 contributor

Feedback

**In this article**



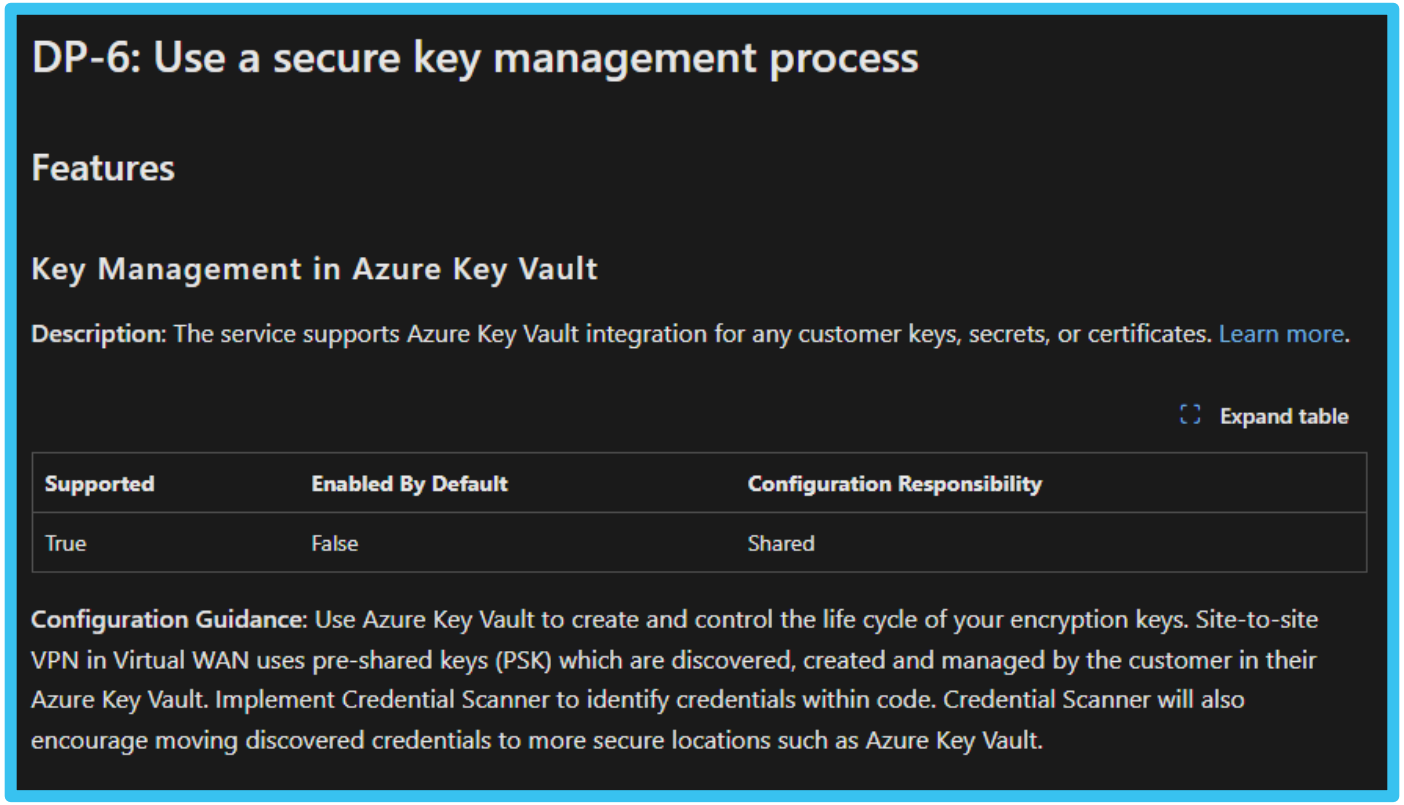
This security baseline applies guidance from the Microsoft cloud security benchmark version 1.0 to Virtual WAN. The Microsoft cloud security benchmark provides recommendations on how you can secure your cloud solutions on Azure. The content is grouped by the security controls defined by the Microsoft cloud security benchmark and the related guidance applicable to Virtual WAN.

You can monitor this security baseline and its recommendations using Microsoft Defender for Cloud. Azure Policy definitions will be listed in the Regulatory Compliance section of the Microsoft Defender for Cloud portal page.

When a feature has relevant Azure Policy Definitions, they are listed in this baseline to help you measure compliance with the Microsoft cloud security benchmark controls and recommendations. Some recommendations may require a paid Microsoft Defender plan to enable certain security scenarios.

https://learn.microsoft.com/en-us/security/benchmark/azure/baselines/virtual-wan-security-baseline

# Azure Security Baseline – a worthwhile read!



## DP-6: Use a secure key management process

### Features

#### Key Management in Azure Key Vault

**Description**: The service supports Azure Key Vault integration for any customer keys, secrets, or certificates. Learn more.

Expand table

| Supported | Enabled By Default | Configuration Responsibility |
|---|---|---|
| True | False | Shared |

**Configuration Guidance**: Use Azure Key Vault to create and control the life cycle of your encryption keys. Site-to-site VPN in Virtual WAN uses pre-shared keys (PSK) which are discovered, created and managed by the customer in their Azure Key Vault. Implement Credential Scanner to identify credentials within code. Credential Scanner will also encourage moving discovered credentials to more secure locations such as Azure Key Vault.

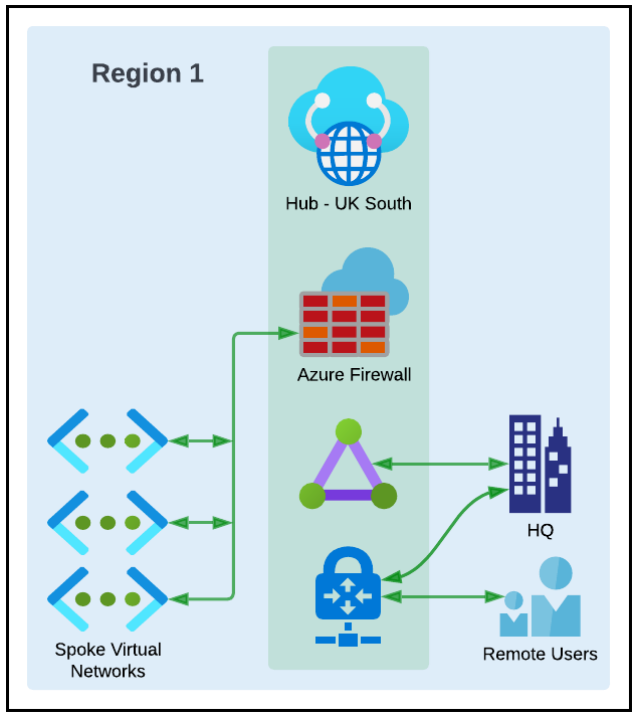
https://learn.microsoft.com/en-us/security/benchmark/azure/baselines/virtual-wan-security-baseline

# Expansion Options

Expansion is easy with Virtual WAN:

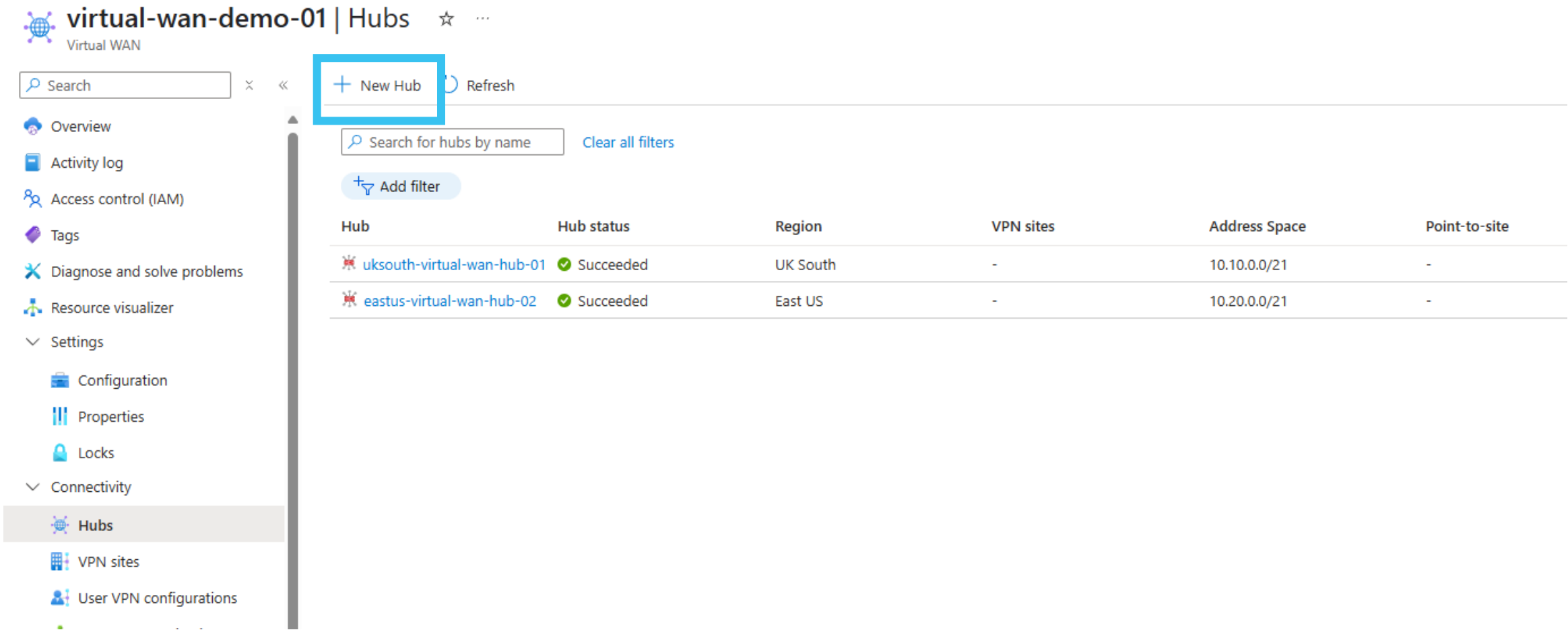
- Our start – Single Virtual WAN hub, ExpressRoute and a VPN Gateway for IPsec or P2S Users.
- Spoke Virtual Networks peered into Virtual WAN hub.
- All Traffic via Single Azure Firewall instance.

**How do we expand to other Regions?**

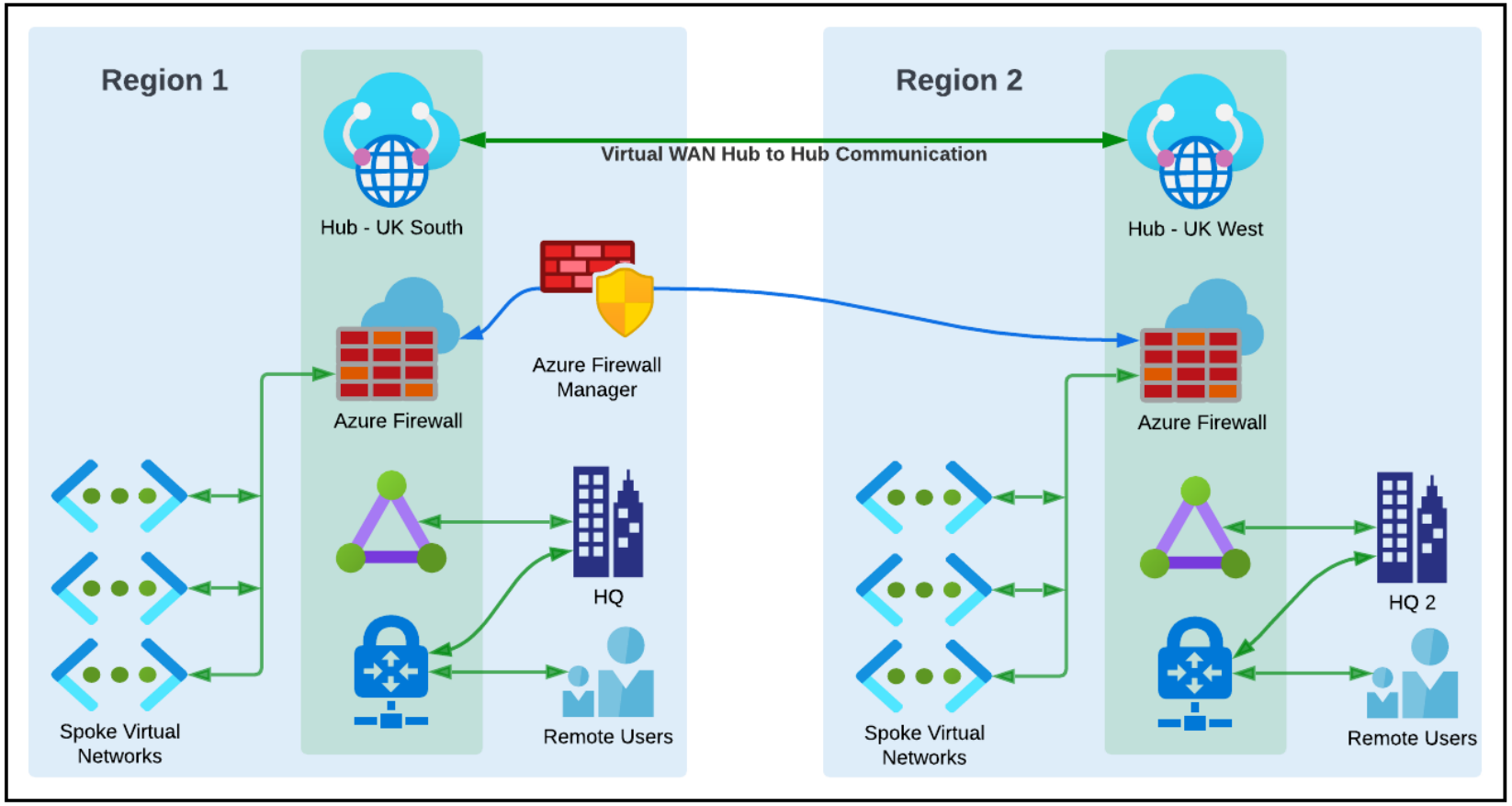


# Expansion Options

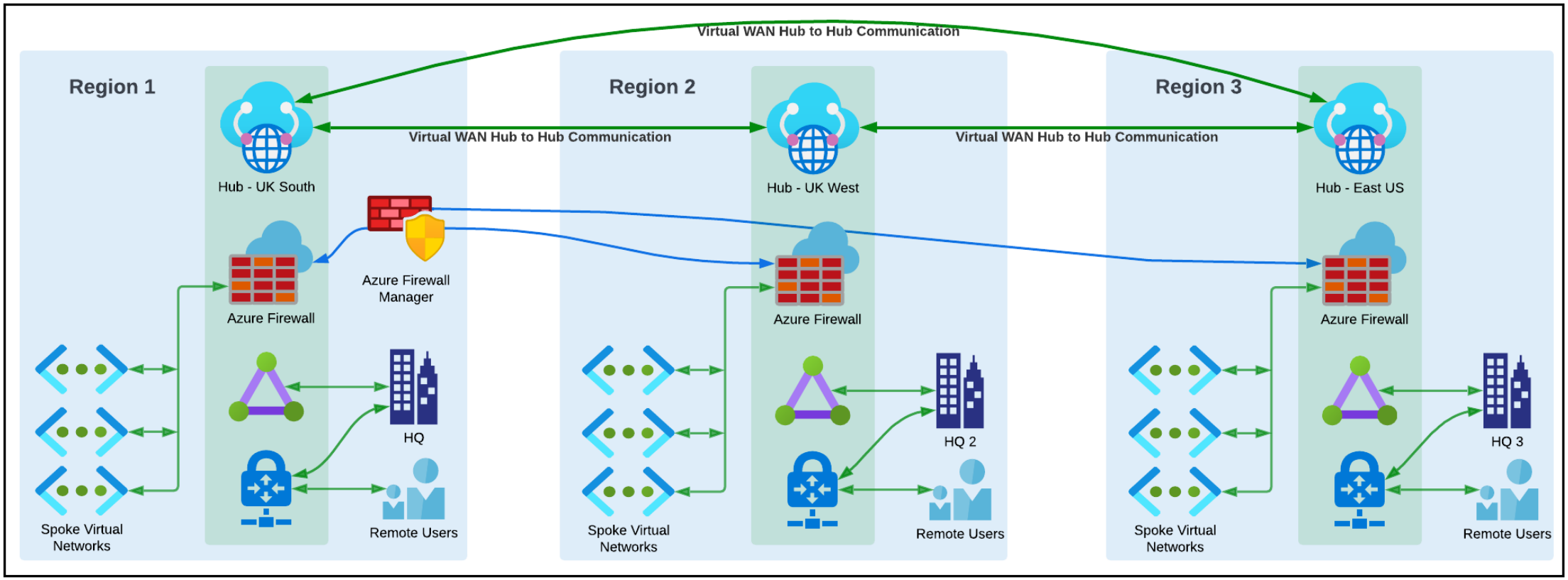
- ✓ Regional Expansion is simple – and done by adding Hubs
- ✓ Hubs are fully-meshed by default, enabling communication



# Expansion Options... +1 Region



# Expansion Options... +2 Regions



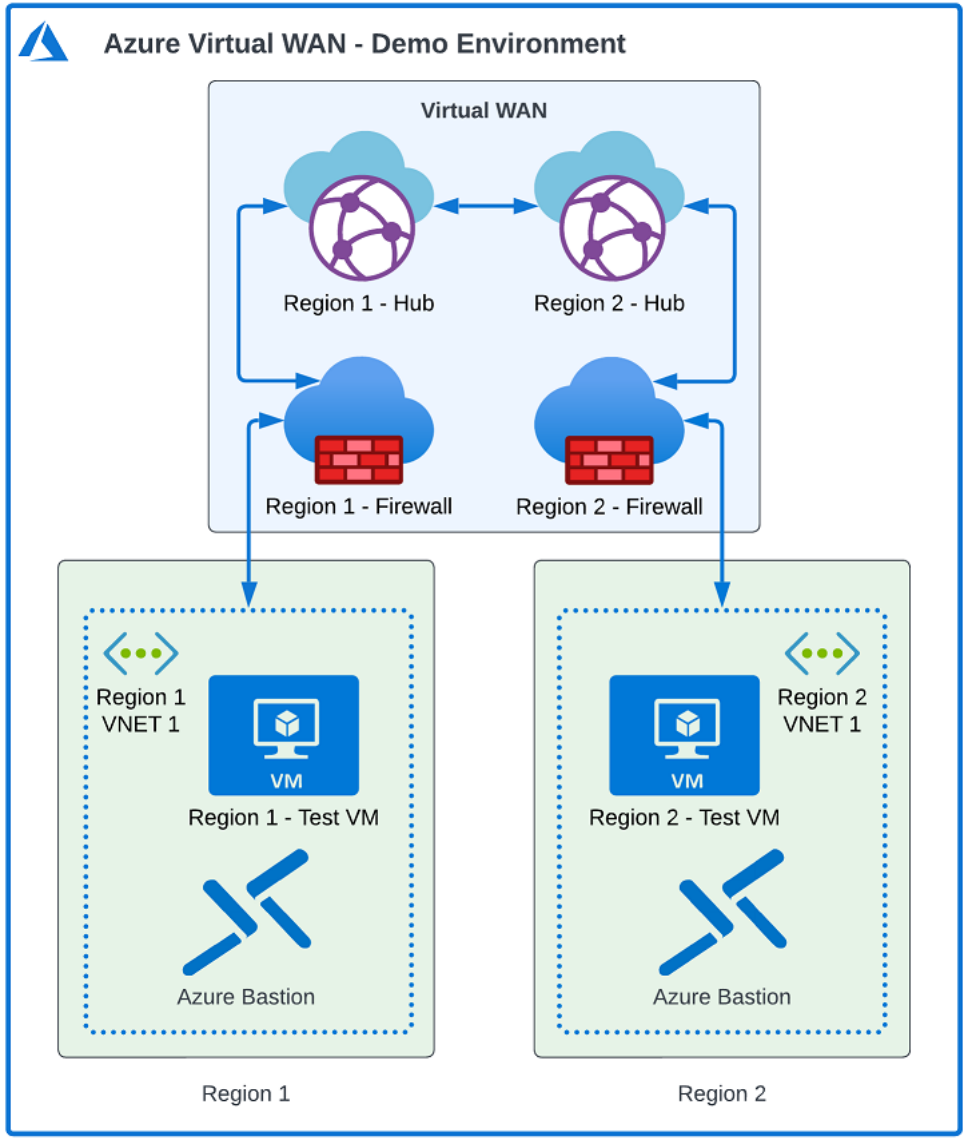
# Expansion Options & Benefits

- ✓ Regional Expansion – **add a Hub, and then other services.**
- ✓ Firewalling options – Scale up to Premium
- ✓ Hub Routing Intent – Cross Region & Internet traffic all via NVAs/AzFWs/SaaS
- ✓ Centralised Firewall Rulesets and Management
- ✓ ExpressRoute and VPN Gateway Support (S2S and P2S)
- ✓ Full Mesh Topology – enabling communication via the MS Global Network
- ✓ Spokes can communicate freely (via Firewalling if required).
- ✓ Automated Route Table Management & Provisioning ★
- ✓ Single Control of Cloud Networking via Virtual WAN
- ✓ Scale in routing units up to 50Gbps (VNet to VNet) and 50,000 VMs per Hub

# Where do we begin?

- **Recommendation** – Get familiar with the basics and concepts using a lab. My Terraform Environment can help here!
- Consider **upskilling and training** – AZ-700 and AZ-305 exams are helpful.
- **Have a plan!** Consider the Cloud Adoption Framework guidance and understand drivers/goals/objectives.
- Organisational deployment - **Start with a Single Hub** and expand from there.
- Consult **Guidance** – MS docs for migrating from Hub/Spoke - https://learn.microsoft.com/en-us/azure/virtual-wan/migrate-from-hub-spoke-topology
- **Engage a Partner** – Design/Implementation/Support etc.

# Demo Lab


Azure Virtual WAN - Demo Environment
Virtual WAN
Region 1 - Hub
Region 2 - Hub
Region 1 - Firewall
Region 2 - Firewall
Region 1
VNET 1
VM
Region 1 - Test VM
Azure Bastion
Region 2
VNET 1
VM
Region 2 - Test VM
Azure Bastion
Region 1
Region 2

# Demo Lab – Costs

| Service category | Service type | Region | Description | Estimated monthly cost |
|---|---|---|---|---|
| Networking | Virtual WAN | East US | 730 Deployment hours, 0 Routing infrastructure units, 10 GB of data processed, Azure firewall integrated (standard tier) with 0 GB of data processed, Site to site VPN connection for 0 scale units, 0 deployed for 730 Hours, User VPN connection for 0 scale units for 730 Hours and 0 scale units for 730 Hours, ExpressRoute connections for 0 scale units, 0 deployed for 730 Hours | $912.70 |
| Networking | Virtual WAN | UK South | 730 Deployment hours, 0 Routing infrastructure units, 10 GB of data processed, Azure firewall integrated (standard tier) with 0 GB of data processed, Site to site VPN connection for 0 scale units, 0 deployed for 730 Hours, User VPN connection for 0 scale units for 730 Hours and 0 scale units for 730 Hours, ExpressRoute connections for 0 scale units, 0 deployed for 730 Hours | $912.70 |
| Networking | Azure Bastion | East US | Basic Tier, 730 Hours, 5 GB Outbound Data Transfer | $138.70 |
| Networking | Azure Bastion | UK South | Basic Tier, 730 Hours, 5 GB Outbound Data Transfer | $138.70 |
| Compute | Virtual Machines | East US | 1 B4ms (4 Cores, 16 GB RAM) x 730 Hours (Pay as you go), Windows (Licence included), OS Only; 1 managed disk – S10; Inter Region transfer type, 5 GB outbound data transfer from East US to East Asia | $138.75 |
| Compute | Virtual Machines | UK South | 1 B4ms (4 Cores, 16 GB RAM) x 730 Hours (Pay as you go), Windows (Licence included), OS Only; 1 managed disk – S10; Inter Region transfer type, 5 GB outbound data transfer from UK South to East Asia | $156.13 |
| Networking | IP Addresses | East US | Standard (ARM), 20 Static IP Addresses X 730 Hours, 0 Public IP Prefixes X 730 Hours | $73.00 |
| | | | **Total** | **$2,470.68** |

# Demo / Lab Environment - Terraform

```
# virtual-wan Resources
# virtual-wan
resource "azurerm_virtual_wan" "virtual-wan1" {
  name                = "${var.lab-name}-virtual-wan-01"
  resource_group_name = azurerm_resource_group.region1-rg1.name
  location            = var.region1

  # Configuration
  office365_local_breakout_category = "OptimizeAndAllow"

  tags = {
    Environment = var.environment_tag
  }
}
# virtual-wan Hub 1
resource "azurerm_virtual_hub" "region1-vhub1" {
  name                = "${var.region1}-virtual-wan-hub-01"
  resource_group_name = azurerm_resource_group.region1-rg1.name
  location            = var.region1
  virtual_wan_id      = azurerm_virtual_wan.virtual-wan1.id
  address_prefix      = var.virtual-wan-region1-hub1-prefix1

  tags = {
    Environment = var.environment_tag
  }
}
```

https://github.com/jakewalsh90/Terraform-Azure/tree/main/Virtual-WAN-Demo

# Demo / Lab Environment – Bicep

Code Blame 313 lines (274 loc) · 11.1 KB

```bicep
@minLength(4)
@maxLength(80)
param vWANname string = 'vWAN'

@description('Region for the Azure Virtual WAN')
param vWANlocation string = resourceGroup().location

@description('Name of the FIRST virtual hub')
@minLength(4)
@maxLength(80)
param hub1Name string = 'Hub1'

@description('Region for the FIRST virtual hub')
param hub1Location string = resourceGroup().location

@description('Address space for the FIRST virtual hub')
param hub1AddressSpace string = '10.1.0.0/23'

@description('Address space for the first VNet (spoke1) connected to the FIRST virtual hub')
param hub1Spoke1AddressSpace string = '10.1.2.0/24'

@description('Address space for the second VNet (spoke2) connected to the FIRST virtual hub')
param hub1Spoke2AddressSpace string = '10.1.4.0/24'

@description('Name of the SECOND virtual hub')
@minLength(4)
@maxLength(80)
param hub2Name string = 'Hub2'

```

azure-quickstart-templates/quickstarts/microsoft.network/virtual-wan-routing-intent at master · Azure/azure-quickstart-templates · GitHub

# Useful Links

- https://learn.microsoft.com/en-us/azure/virtual-wan/
- **John Savill** - https://www.youtube.com/watch?v=f-GyAURZWzg
- **Global Transit Architecture**: https://learn.microsoft.com/en-us/azure/virtual-wan/virtual-wan-global-transit-network-architecture

- https://jakewalsh.co.uk/deploying-azure-virtual-wan-using-terraform/
- https://github.com/jakewalsh90/Terraform-Azure/tree/main/vWAN-DemoLab
- https://github.com/jakewalsh90/Terraform-Modules-Azure/tree/main/azure-quick-virtualwan
- Exams – Az-700 and Az-305

- NVA Options: https://learn.microsoft.com/en-us/azure/virtual-wan/about-nva-hub
- https://learn.microsoft.com/en-us/azure/virtual-wan/about-nva-hub#partners

# Q & A

# Thank You!

## An Introduction to Azure Virtual WAN

Jake Walsh

*Please note – the views/opinions in this presentation are entirely my own.*
***If in any doubt, please check latest documentation and MS Links for updated info!***