

Building a Cloud Centric Network with Azure Virtual WAN





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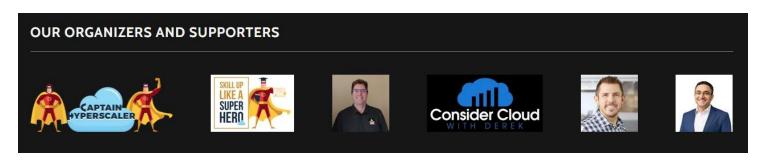




Azure Back to School 2024!



https://azurebacktoschool.com/





Azure Virtual WAN – Again?

https://jakewalsh.co.uk/azure-back-to-school-2024-building-a-cloud-centric-network-with-azure-virtual-wan/



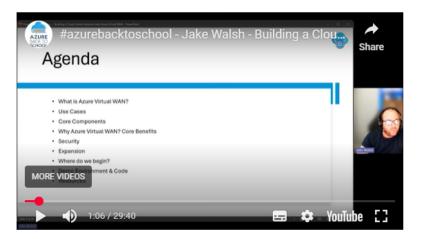
Jake Walsh Cloud, DevOps, EUC, Infrastructure and more...

Azure Back to School 2024 – Building a Cloud Centric Network with Azure Virtual WAN

September 13, 2024 \cdot Azure, Azure Virtual WAN, Community, Microsoft, Terraform, Uncategorized

Tagged: Azure, Azure Virtual WAN, Community, HashiCorp, HashiCorp Ambassador, Microsoft, Terraform

This September, Azure Back to School 2024 is taking place, with loads of awesome sessions and great community content. My session, "Building a Cloud Centric Network with Azure Virtual WAN" is available to watch below:



Check out all of the other awesome sessions and content here: https://azurebacktoschool.com/



Azure Back to School 2025 – Virtual WAN session:

- Changes to Virtual WAN
- Recap of Core Components
- IAC Deployment (Terraform)



Azure Virtual WAN – Again?

https://jakewalsh.co.uk/azure-back-to-school-2024-building-a-cloud-centric-network-with-azure-virtual-wan/



Virtual WAN is always improving....

Туре	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

Virtual WAN is always improving....



Type	Area	Name	Description	Date added	Limitations
Feature	Network Virtual Appliances NVAs/Integrated Third-party solutions in Virtual WAN hubs	IP allocation	Capability to add additional IP addresses to both internal and external interfaces of NVAs in the Virtual WAN hub. Addresses scalability concerns related to SNAT port exhaustion.	April 2025	See IP allocation documentation.
Feature	Network Virtual Appliances NVAs/Integrated Third-party solutions in Virtual WAN hubs	NVA Re-image	Capability to re-image existing NVA deployment(s) to base unconfigured image pulled from Azure Marketplace.	April 2025	See reimage documentation.
Feature	Network Virtual Appliances (NVAs)/Integrated Third-party solutions in Virtual WAN hubs	Versa VOS	General Availability of of Versa VOS ☑.	February 2025	See Versa ☑ documentation.
Feature	Network Virtual Appliances (NVAs)/Integrated Third-party solutions in Virtual WAN hubs	Cisco Firepower Threat Defense	General Availability of Cisco Firepower Threat Defense ☑ in the Virtual WAN hub.	February 2025	See Cisco documentation ☑. Same limitations as routing intent.

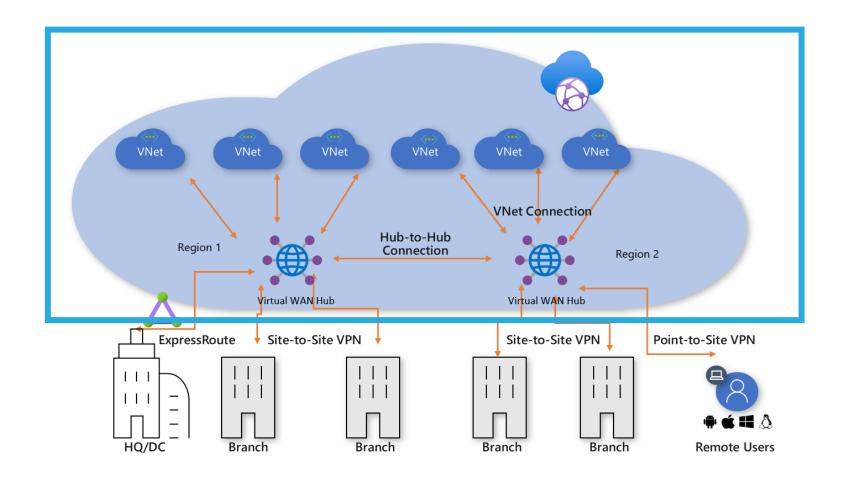


Core Components

- 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

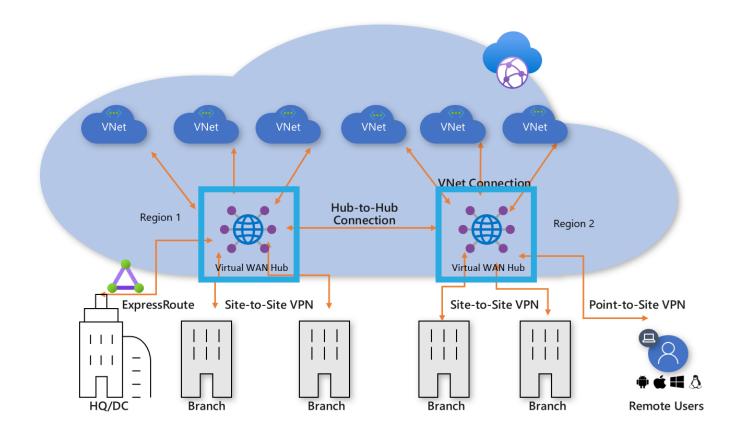


- Virtual overlay of your Azure Networking
- A collection of multiple Resources
- Contains all Virtual WAN components within your topology



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!

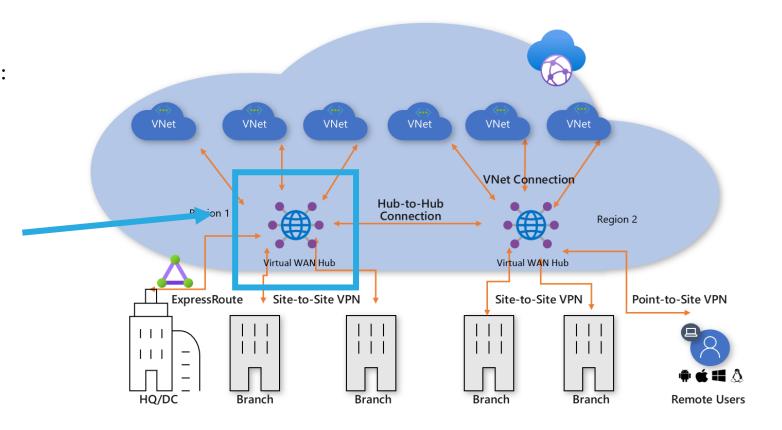




What's in the Hub?

Items we can deploy into a Hub:

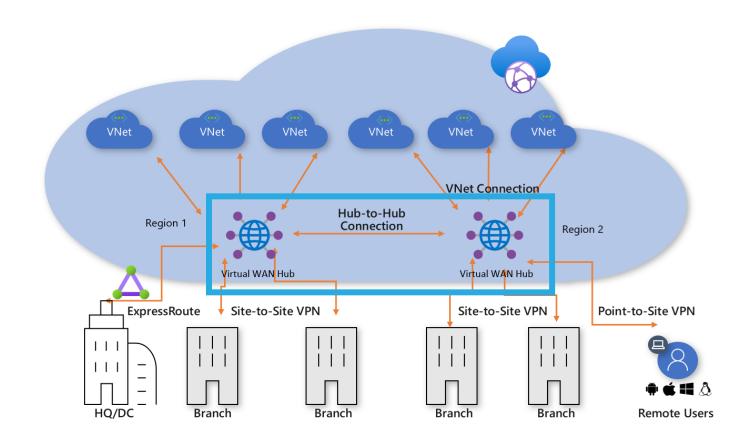
- Virtual Network Gateway
- ExpressRoute Gateway
- P2S Gateway
- Azure Firewall or NVA
- Route Tables
- Hub to Hub Connection





Hub to Hub Connection

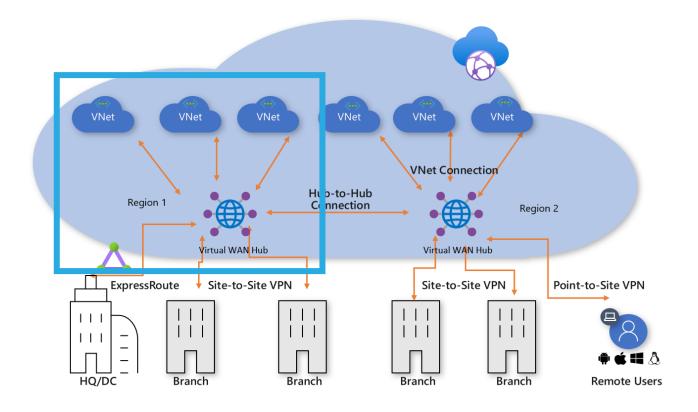
- Virtual WAN Hubs are connected within a Virtual WAN.
- Hubs can communicate freely and routing is propagated.
- Inter-Region connectivity is established using Virtual WAN Hubs.
- Connectivity can be controlled using a Firewall or NVA. Note: there are were limitations around interregion communication.





Hub Virtual Network Connection

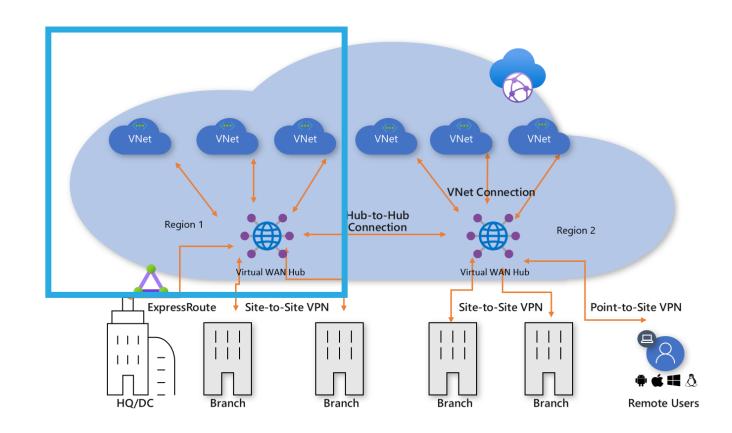
- A Hub Virtual Network connection joins a spoke network to a Virtual WAN Hub.
- A Virtual Network can be connected to a single Virtual WAN hub.
- Traffic is enabled between the Virtual WAN Hub and Spoke Virtual Network.
- Azure Firewall or an NVA is used in many cases to control this traffic.





Hub Route Table

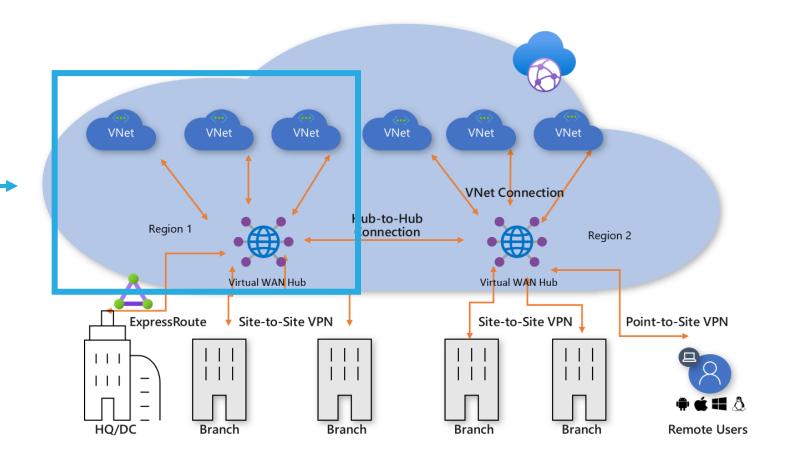
- Each Hub has its own default route table. This can be edited to add static routes if required.
- Static routes take precedence over dynamic routes.
- Associated with a Hub and it's connected Virtual Networks.
- Connections, e.g. VPN, ExpressRoute or PS2 will also have a routing configuration that propagates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



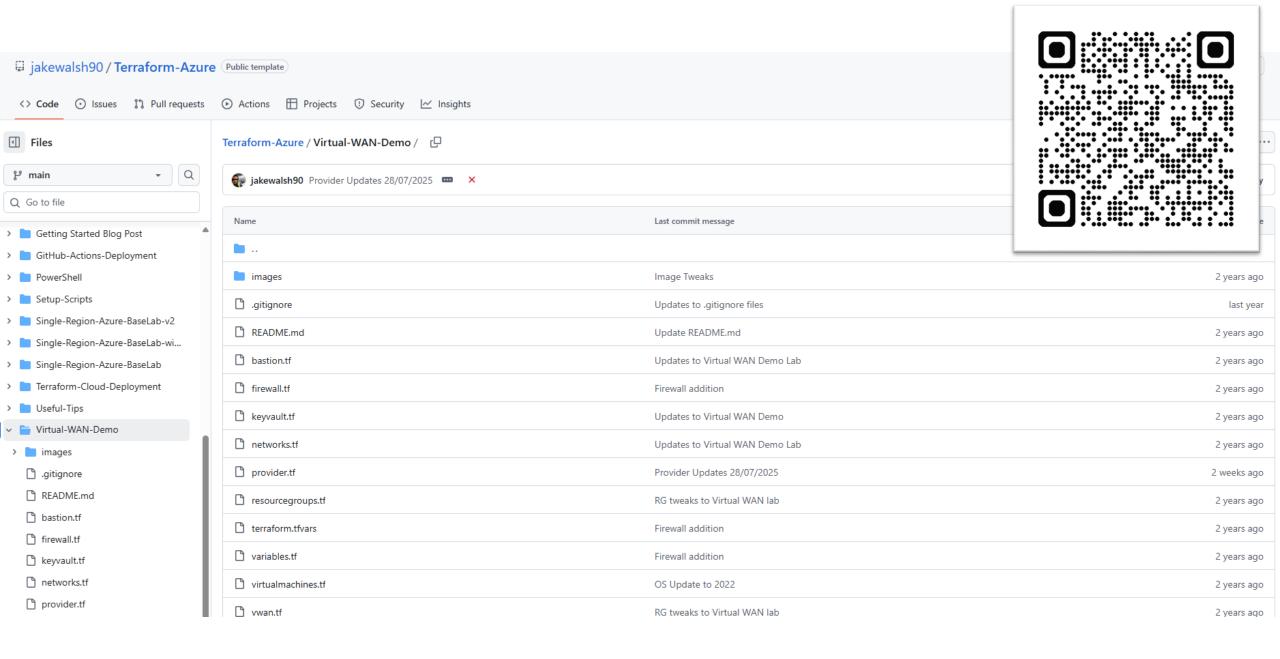


What about Hub and Spoke?

- 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.



```
zurerm_firewall" "region2-azfw" > ધ virtual_hub > # public_i
                ·m firewall" "region1-azfw" {
                      = var.azfw ? 1 : 0
                      = "${var.region1}-fw01"
                      = var.region1
                  name = azurerm_resource_group.region1-rg1.nam
Terraform
                      = "Standard"
                      = "AZFW_Hub"
Deployment
                      = azurerm_firewall_policy.fw-pol01[0].id
                id = azurerm virtual hub.region1-vhub1.id
               ount = 1
```



Some help from the blog!

 $\label{eq:loud_period} \textbf{Jake Walsh} \quad \text{Cloud, DevOps, EUC, Infrastructure and more...}$

June 2025 – A month of Azure Virtual WAN!

June 30, 2025 · CloudFamily, Community, Events, HashiCorp, HashiCorp Ambassador, Infrastructure as Code, Uncategorized, Virtual WAN

Tagged: Azure, HashiCorp, HashiCorp Ambassador, IAC, Infrastructure as Code, Microsoft, Virtual WAN

Back in 2022 I first started working with Azure Virtual WAN, and wrote a blog post around deployment of the service using Terraform (https://jakewalsh.co.uk/deploying-azure-virtual-wan-using-terraform/). Since then I've worked with Virtual WAN on numerous deployments, bringing Cloud networking and Infrastructure as Code together to provide flexible and rapidly deployed networking environments – that take advantage of Microsoft's Global Network.

If you are interested in seeing more about Microsoft's Global Network infrastructure – check out the Globe view available here: https://datacenters.microsoft.com/globe/explore/



focus on Virtual WAN, with two Community speaking sessions oth sessions focused on providing an introductory overview, Jake Walsh Cloud, DevOps, EUC, Infrastructure and more...

Deploying Azure Virtual WAN using Terraform

June 17, 2022 · Azure, Azure Virtual WAN, Citrix, Citrix Cloud, CloudFamily, Community, DevOps, Firewall, GitHub, GitHub Actions, HashiCorp, HashiCorp Ambassador, Microsoft, Terraform, Virtual WAN

Tagged: Azure, Azure DevOps, Azure Virtual WAN, CloudFamily, Community, Microsoft, Terraform, Virtual WAN

Overview

Recently I have been working with **Azure Virtual WAN** to provide connectivity between Azure Regions, Branch Offices, and Remote Users. Azure Virtual WAN is a networking service that brings many of the commonly found connectivity services into a single area, providing simplified connectivity and management. These services include:

- Branch connectivity.
- Site-to-site VPN connectivity.
- Remote user VPN connectivity (point-to-site).
- Private connectivity (ExpressRoute).
- o Intra-cloud connectivity (transitive connectivity for virtual networks)
- VPN ExpressRoute inter-connectivity.
- o Routing, Azure Firewall, and encryption for private connectivity.

You can read more about Azure Virtual WAN on the Microsoft Documen https://docs.microsoft.com/en-us/azure/virtual-wan/virtual-wan-al



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