Microsoft Azure ExpressRoute Overview

Microsoft Azure

ExpressRoute Overview

ExpressRoute lets you extend your on-premises networks into the Microsoft Cloud over a private connection with the help of a connectivity provider. ExpressRoute can help form connections to Microsoft Cloud services, such as Microsoft Azure and Microsoft 365.

ExpressRoute uses BGP, an industry standard dynamic routing protocol, to exchange routes between your on-premises network, your instances in Azure, and Microsoft public addresses

Private Peering allows access to IaaS and PaaS resources such as your Azure VMs, Virtual Networks, SQL DBs, etc.
Microsoft Peering allows access to Microsoft online services such as Office 365, Dynamics 365, Skype for Business, etc.

Key ExpressRoute Benefits/Features

Layer 3 connectivity between on-premises network and Microsoft Cloud through a connectivity provider. Connectivity can be from an any-to-any (IPVPN) network, a point-to-point Ethernet connection, or through a virtual cross-connection via an Ethernet exchange.

ExpressRoute is **faster**, more **reliable** and **secure** than typical VPN solution. The data is private and does not traverse the internet.

Dynamic routing between your network and Microsoft via **BGP**.
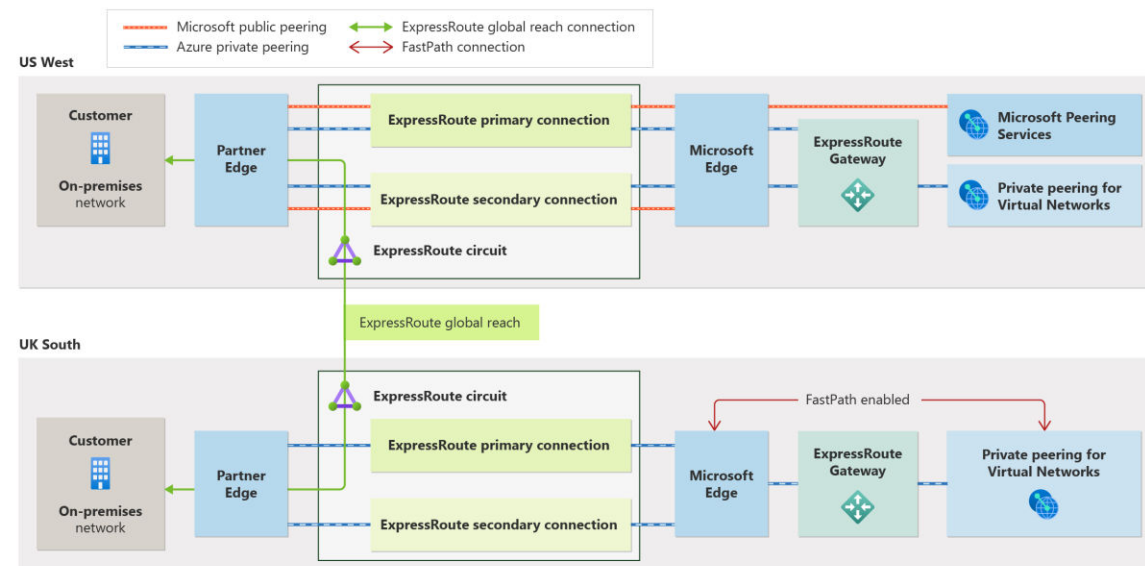
Redundancy - Each ExpressRoute circuit consists of **two connections** to two Microsoft Enterprise edge routers (MSEEs) at an ExpressRoute Location from the connectivity provider or your network edge.

ExpressRoute FastPath can help to **improve** the **data path performance between on-premises and Azure.** FastPath sends network traffic directly to the Virtual Machines in the Virtual Network, bypassing the gateway and reducing the number of hops and potential bottlenecks.

With **ExpressRoute Global Reach**, you can link its circuits together to make a private network between your on-premises networks. ExpressRoute Global Reach allows you to have multiple on-premises networks in different locations and connect them together.

ExpressRoute Connectivity Models

Collocated at Cloud Exchange	If you're collocated in a facility with a cloud exchange, you can request for virtual cross-connections to the Microsoft Cloud through the colocation provider's Ethernet exchange. Colocation providers can offer either Layer 2 cross-connections, or managed Layer 3 cross-connections between your infrastructure in the colocation facility and the Microsoft Cloud.
Point-to-Point Ethernet Connections	You can connect **your on-premises datacenters** or offices to the Microsoft Cloud through point-to-point Ethernet links. Point-to-point Ethernet providers can offer Layer 2 connections, or managed Layer 3 connections between your site and the Microsoft Cloud.
Any-to-any (IPVPN) Networks	You can integrate your **WAN** with the Microsoft Cloud. IPVPN providers (typically MPLS VPN) offer any-to-any connectivity between your branch offices and datacenters. The Microsoft Cloud can be interconnected to your WAN to make it appear like any other branch office. WAN providers typically offer managed Layer 3 connectivity.
ExpressRoute Direct & ExpressRoute Traffic Collector	You can connect directly into the Microsoft global network at a peering location strategically distributed across the world. ExpressRoute Direct provides dual **100-Gbps** or 10-Gbps connectivity that supports Active/Active connectivity at scale and can provide MACsec encryption. **ExpressRoute Traffic Collector** enables sampling of network flows sent over your ExpressRoute Direct circuits. You can use these flow logs to look into various traffic insights such as capacity forecasting, near real-time performance/throughput visibility, monitor both private & MSFT peering traffic, and more.

ExpressRoute Main Components

Customer's Network (on-premises)	This is the customer's organizations private local-area network (LAN) running within the customer's premises.
Edge Routers & Connections	• **Local Edge Routers**: These link the on-premises network to the ExpressRoute circuit • **Microsoft Edge Routers (MSEEs):** These reside on the Microsoft side of the ExpressRoute circuit and serve as the point of entry into Microsoft's network. • **ExpressRoute Circuits - Dual BGP Connections**: Requires two BGP connections from the Partner Edge to the MSEEs.

ExpressRoute Helpful Links

List of service providers	Provides the regions and service providers available for an ExpressRoute circuit.
Subscription limits	Limitations specific to subscriptions for ExpressRoute circuits.
ExpressRoute performance limits	Performance limitations for ExpressRoute circuits by type and SKU
Route limits	Limitations specific to the amount of routes advertisements on a given ExpressRoute circuit
ExpressRoute FAQs	A list of commonly asked questions and answers for ExpressRoute
Troubleshooting	Common Troubleshooting Topics
Maximum resiliency	Designing for Disaster Recovery with ExpressRoute Private Peering
Well-architected framework review	Article that provides architectural best practice for ExpressRoute guidance on reliability, security, cost optimization, operational excellence, and performance efficiency.