ExpressRoute

Last updated by | Subbu Kandhaswamy | Oct 29, 2021 at 3:40 PM PDT


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Summary

This section provides basics on ExpressRoute, peering options within ExpressRoute and information regarding how to set these up with Azure SQL Database, Managed Instance, PostgreSQL and MySQL. The information has public links provided and is intended to introduce connectivity basics between given PaaS offerings through ExpressRoute peering.

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ExpressRoute basics

ExpressRoute provides logical connectivity from the customer's On Premise networks to the Microsoft cloud services. This connectivity is provided through a service provider that are listed in the provider list when configuring ExpressRoute. You can create ExpressRoute the same way any new resource is provisioned on the Azure portal.
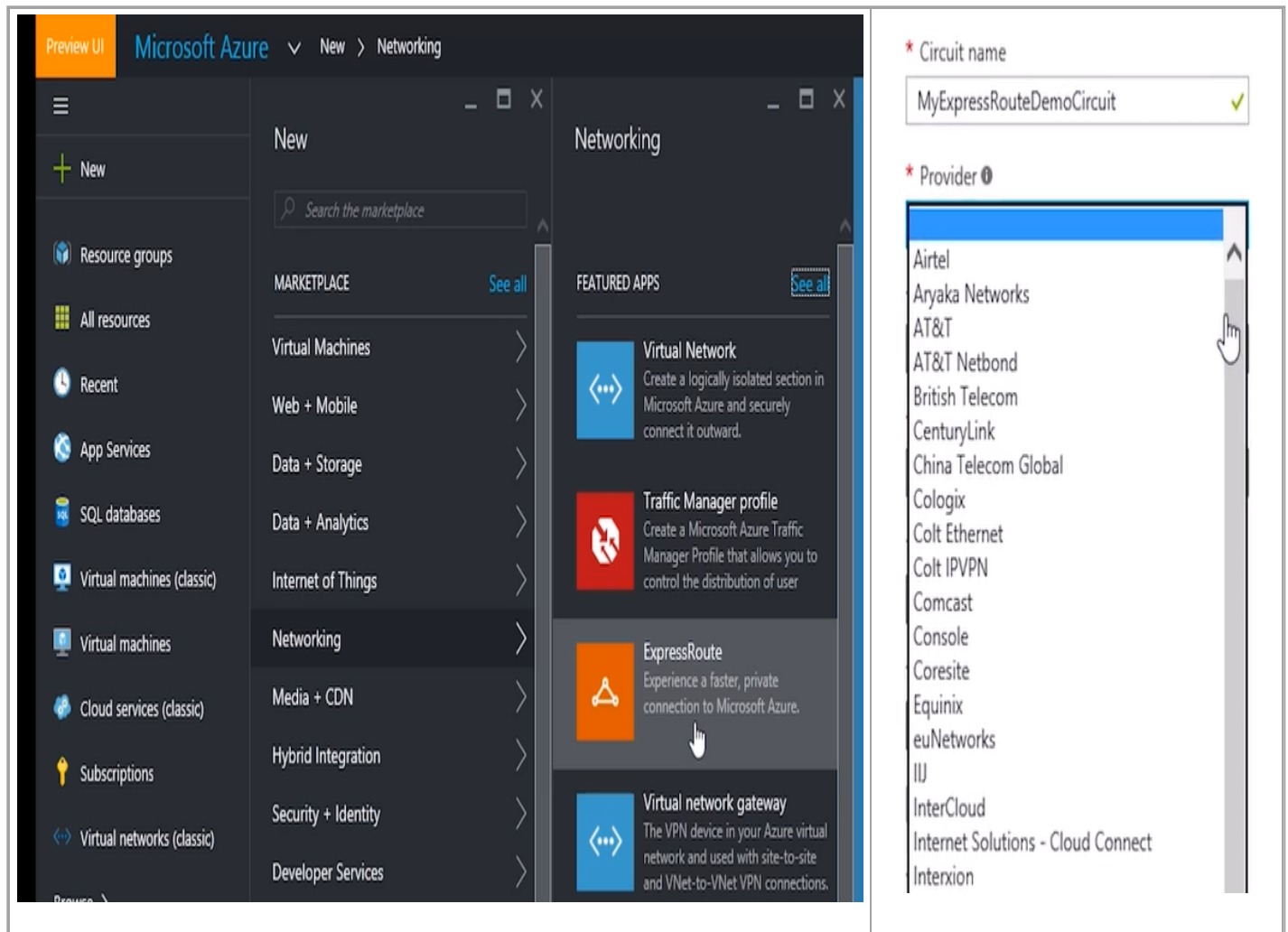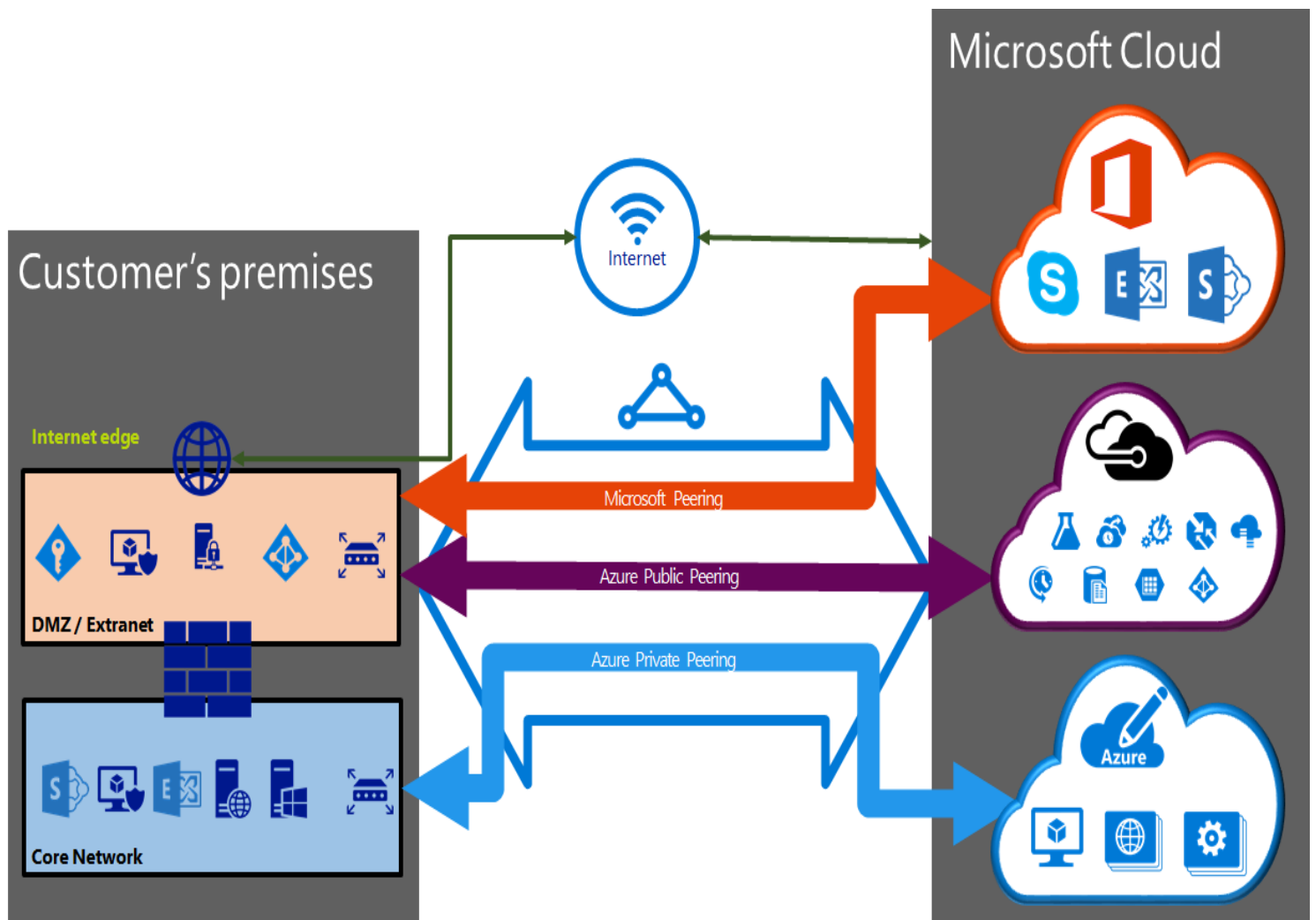
ExpressRoute provides two connections - primary and secondary between the partner/service provider and the Microsoft edge. The connections in between edges is routed through BPG routers and it needs one /29 or two /30 subnets, that collectively provide 4 IP addresses. These IPs are associated to the partner edge and Microsoft edge for both primary and secondary connection:
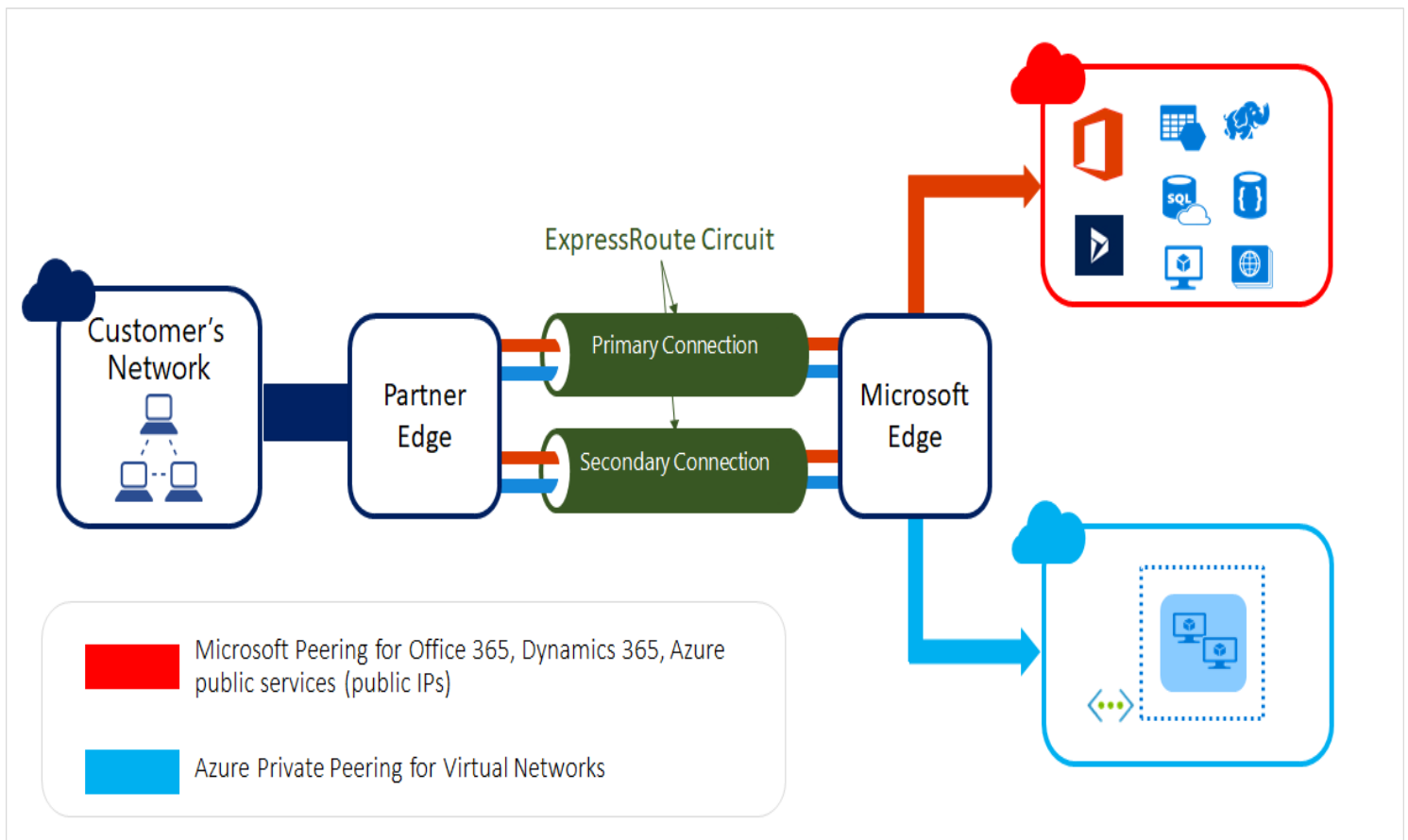
The ExpressRoute circuit limitations are defined through difference between SKUs of Standard and Premium. Standard allows connectivity to the same region where the peering location is defined. Whereas, Premium offering enables connectivity from peering location to any region globally.

Peering basics

Once ExpressRoute is setup, you can choose among the 3 different types of peering options to decide how cloud services are connected with the On Premise network.

Private Peering	Public Peering	Microsoft Peering
Bi-directional trusted VNET connection between On Premise networks and Microsoft Azure VNETs via private IP addresses.	Services that are offered through public IP addresses can be accessed via public peering.	SaaS connectivity mainly for public IP addresses owned by customers that selectively are routed by the service provider through ExpressRoute.

The difference can be summarized with this diagram:
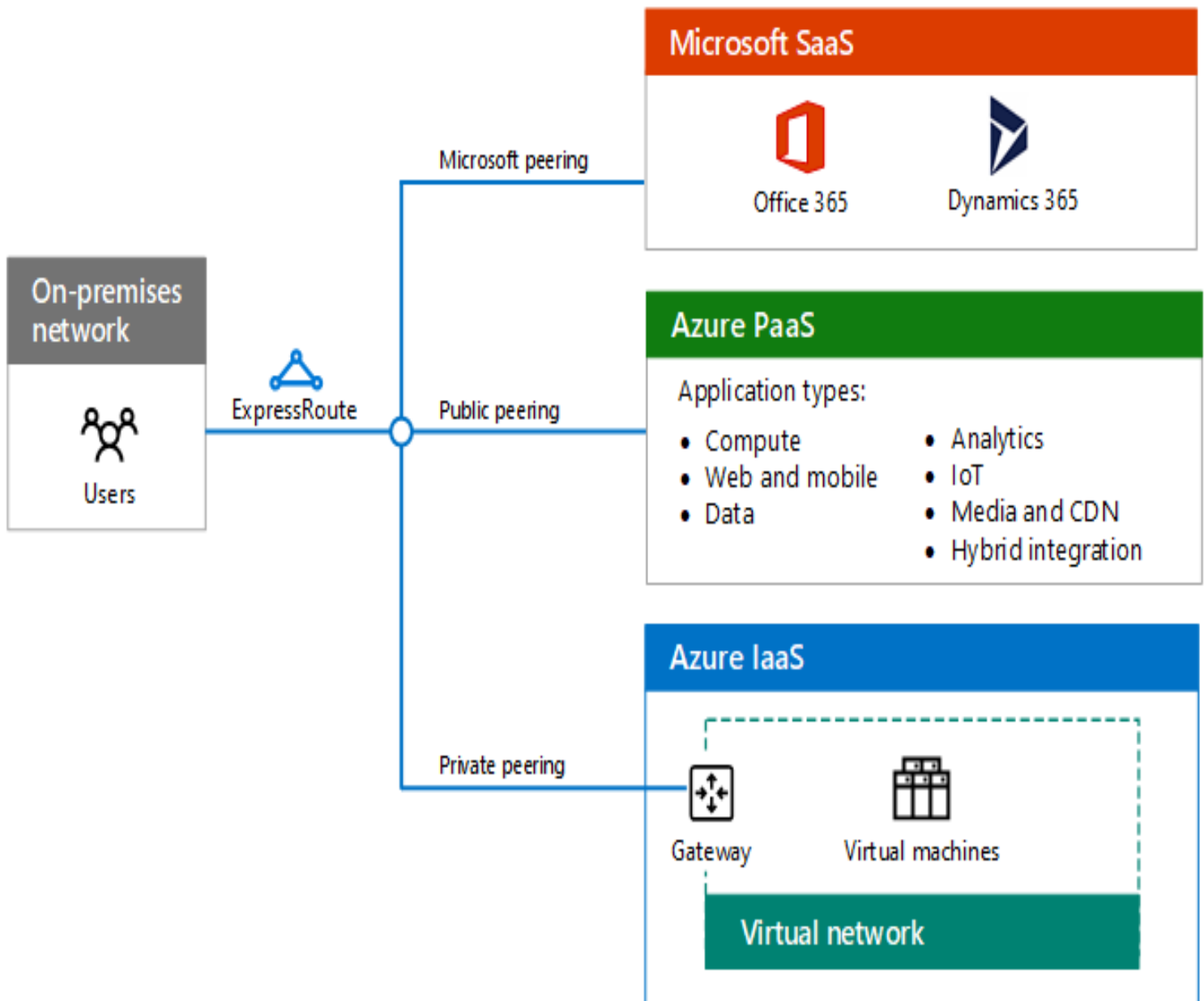
More: ExpressRoute peering relationships to Microsoft cloud services

https://docs.microsoft.com/en-us/office365/enterprise/expressroute-for-microsoft-cloud-connectivity

ExpressRoute and SQL Database

Azure SQL Database PaaS requires that customers user Public Peering option. The VNET service endpoints are required for this connectivity of over public peered ExpressRoute circuit.

Azure SQL Database and Data Warehouse VNET Service Endpoints public preview

https://azure.microsoft.com/en-us/blog/azure-sql-database-vnet-service-endpoints-now-in-public-preview/

Note: Does not extend to on-premises via Private Peering Express Route (Public Peered Express Route to Azure SQLDB is still supported), Site-to-Site (S2S) VPN, or Peered VNets.

More information on ExpressRoute circuits, routing domains and public peering context:

ExpressRoute circuits and routing domains

https://docs.microsoft.com/en-us/azure/expressroute/expressroute-circuit-peerings

Azure Public peering

Services such as Azure Storage, SQL databases, and Websites are offered on public IP addresses. You can privately connect to services hosted on public IP addresses, including VIPs of your cloud services, through the public peering routing domain.

ExpressRoute routing requirements

https://docs.microsoft.com/en-us/azure/expressroute/expressroute-routing

Public peering

The Azure public peering path enables you to connect to all services hosted in Azure over their public IP addresses.

Video: How to setup Azure Public Peering?

https://channel9.msdn.com/Blogs/Azure/Azure-ExpressRoute-How-to-set-up-Azure-public-peering-for-your-ExpressRoute-circuit

https://azure.microsoft.com/en-us/resources/videos/azure-expressroute-how-to-set-up-azure-public-peering-for-your-expressroute-circuit/

Note: PostgreSQL and MySQL being PaaS like SQL DB, should be configured the same way through public peering and VNET service endpoint.

See MySQL VNET support / PostgreSQL VNET support for more details.

ExpressRoute and Managed Instance

Azure SQL Managed Instance provides a private IP address endpoint within the VNET of the Azure network configuration. Hence, native virtual network requirements meet this criteria for ExpressRoute connectivity through private peering. This peering can happen through either Azure virtual network peering or through gateway.

The VNET peering is synonymous to the private peering out of the peering options since Managed Instance has private IP range associated with it.
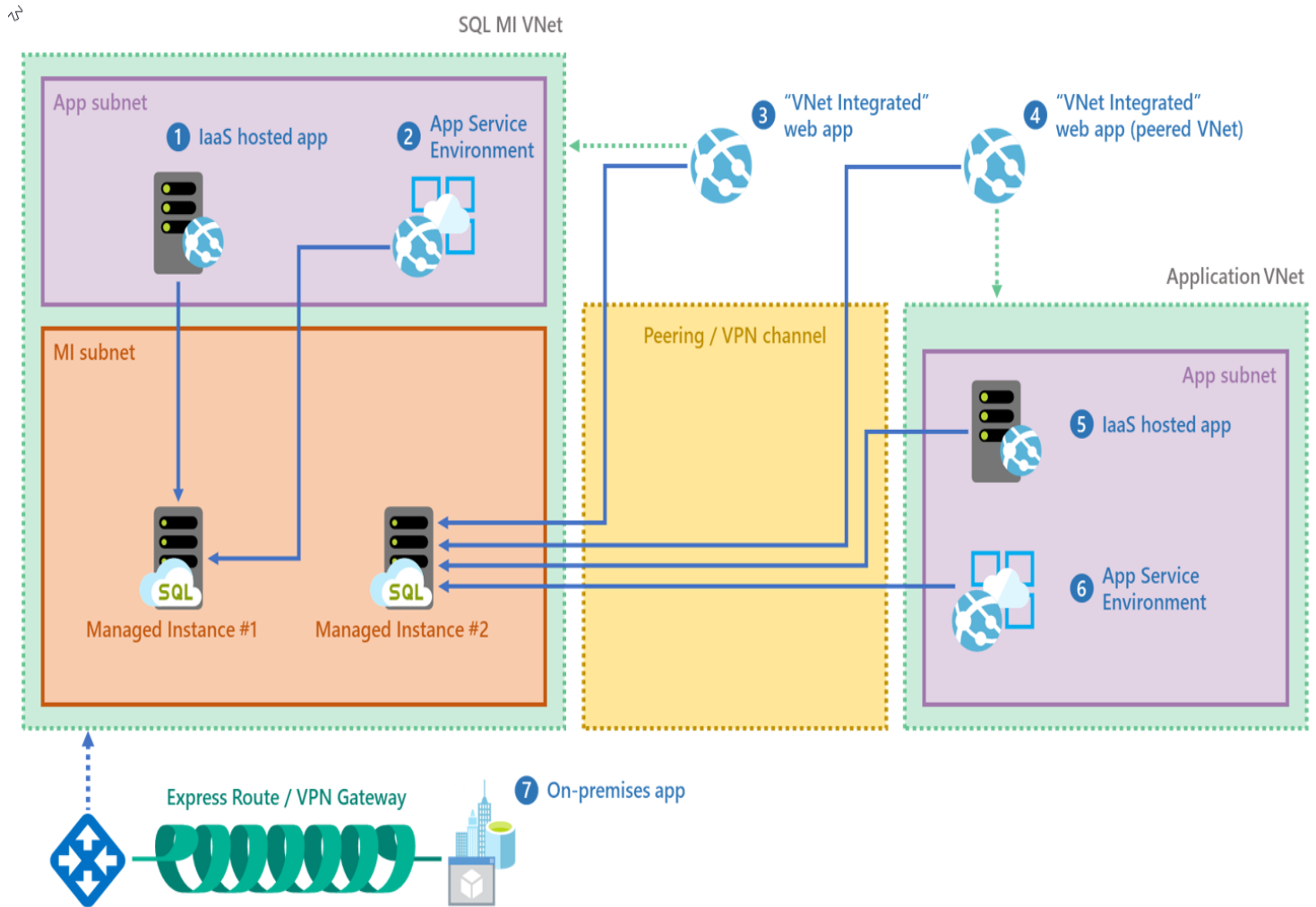
Connect your application to Azure SQL Database Managed Instance

https://docs.microsoft.com/en-us/azure/sql-database/sql-database-managed-instance-connect-app

ExpressRoute & peering general information

Virtual Network (vNet) Peering ⬈

How to configure ExpressRoute Circuit for Public Peering through CLI ⬈

Section: Azure public peering

ExpressRoute FAQ)

https://docs.microsoft.com/en-us/azure/expressroute/expressroute-faqs

Most of the Azure services are supported. Please check directly with the service that you want to use to verify support.

Can I block Internet connectivity to virtual networks connected to ExpressRoute circuits?

Yes. You can advertise default routes (0.0.0.0/0) to block all Internet connectivity to virtual machines deployed within a virtual network and route all traffic out through the ExpressRoute circuit.

If you advertise default routes, we force traffic to services offered over public peering (such as Azure storage and SQL DB) back to your premises. You will have to configure your routers to return traffic to Azure through the public peering path or over the Internet. If you've enabled a service endpoint (preview) for the service, the traffic to the service is not forced to your premises. The traffic remains within the Azure backbone network.

ExpressRoute Limits

Maximum number of routes for Azure public peering with ExpressRoute standard   200

Maximum number of routes for Azure public peering with ExpressRoute premium add-on   200

Video: How to create ExpressRoute circuit?

https://azure.microsoft.com/en-us/resources/videos/azure-expressroute-how-to-create-an-expressroute-circuit/

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