CenturyLink IQ+ Cloud Port to Microsoft Azure via Azure Portal Azure Resource Manager (ARM)

Direct, Secure, Private Connection to Microsoft Azure

Contents:

April 1 , 2018

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Purpose

The purpose of this document is to provide an end-to-end walk through for a customer setting up ExpressRoute for the first time via CenturyLink's IQ+ Cloud Port.

Information contained is provided to serve as a supplement to Microsoft documentation linked throughout this document. Users should check the provided links to obtain the most up-to-date information.

Disclaimer: The material in this guide is for informational purposes only and is taken from Microsoft Azure's website material. All Microsoft related configuration information is based off of the Azure Resource Manager (ARM) portal environment. Customer should work with their CenturyLink account team for specific detailed solutions.

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Roles and Responsibilities

Roles and Responsibilities			
STEPS REQUIRED TO SET UP AZURE EXPRESSROUTE CONNECTIVITY	**End Customer**	**CenturyLink**	**Microsoft Azure**
SET UP PHYSICAL CONNECTIVITY TO AZURE EXPRESSROUTE LOCATION			
Order MSFT Azure ExpressRoute connection via MSFT Azure Portal, using 'Equinix' as the Service Provider name, with the appropriate bandwidth and location	X		
Provision dedicated circuit and provide the Service Key			X
Decide on the type of BGP peering required (Azure Private or Microsoft/O365)	X		
Order Layer 3 (MPLS) connection to Azure ExpressRoute location	X		
Provision Layer 3 (MPLS) Service device with BGP, connecting to MSFT Azure ExpressRoute		X	
ORDER VIRTUAL CIRCUITS(S) ON EQUINIX CLOUD EXCHANGE TOWARDS AZURE EXPRESSROUTE			
Create Virtual Circuit		X	
Monitor Virtual Circuit		X	
SET UP BGP PEERING BETWEEN CENTURYLINK PROVIDED CUSTOMER EDGE AND AZURE EDGE DEVICE			
Configure BGP Peering on Customer Edge		X	
Configure BGP Peering on Azure side	X		
*** Configure BGP Route Filtering (Optional for Azure Public, **required for Microsoft Peering**)	X		
LINK SERVICES ON AZURE TO THE DEDICATED CIRCUIT			
Link virtual Network to the dedicated circuit*	X		
*Connectivity to services hosted on Public IPs is enabled as soon as the dedicated circuit has been enabled			

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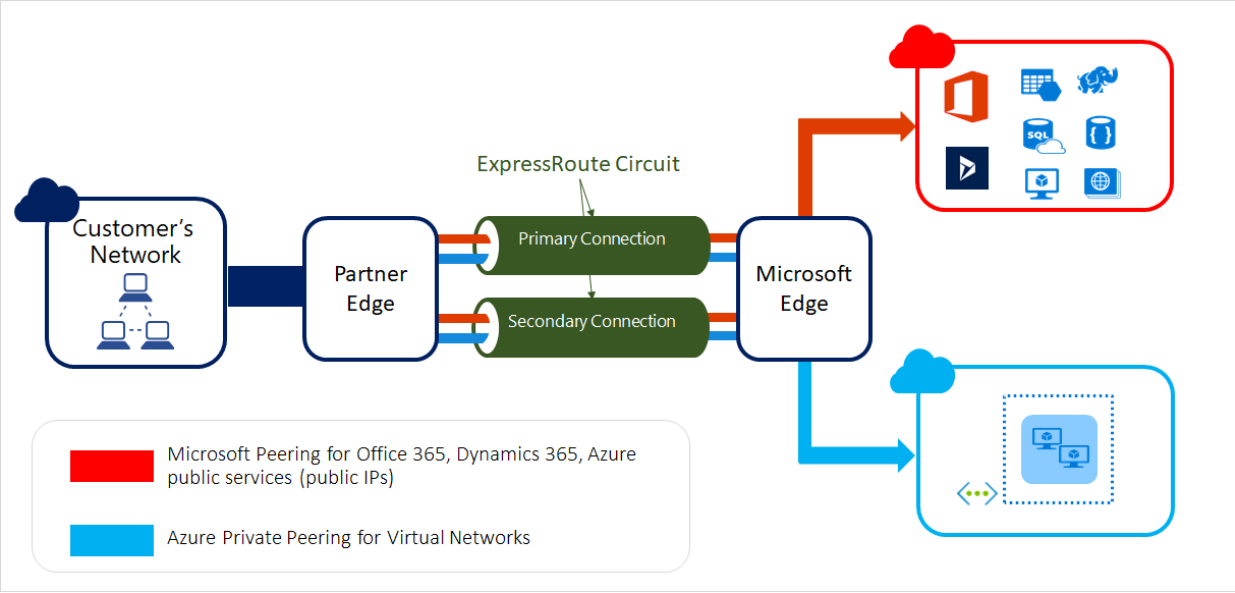
Background Information

What is Microsoft ExpressRoute (https://azure.microsoft.com/en-us/documentation/articles/expressroute-introduction/)



	Private Peering	Microsoft Peering
Max. # prefixes supported per peering	4000 by default, 10,000 with ExpressRoute Premium	200
IP address ranges supported	Any valid IP address within your WAN.	Public IP addresses owned by you or your connectivity provider.
AS Number requirements	Private and public AS numbers. You must own the public AS number if you choose to use one.	Private and public AS numbers. However, you must prove ownership of public IP addresses.
IP protocols supported	IPv4 and IPv6	IPv4 and IPv6
Routing Interface IP addresses	RFC1918 and public IP addresses	Public IP addresses registered to you in routing registries.
MD5 Hash support	Yes	Yes

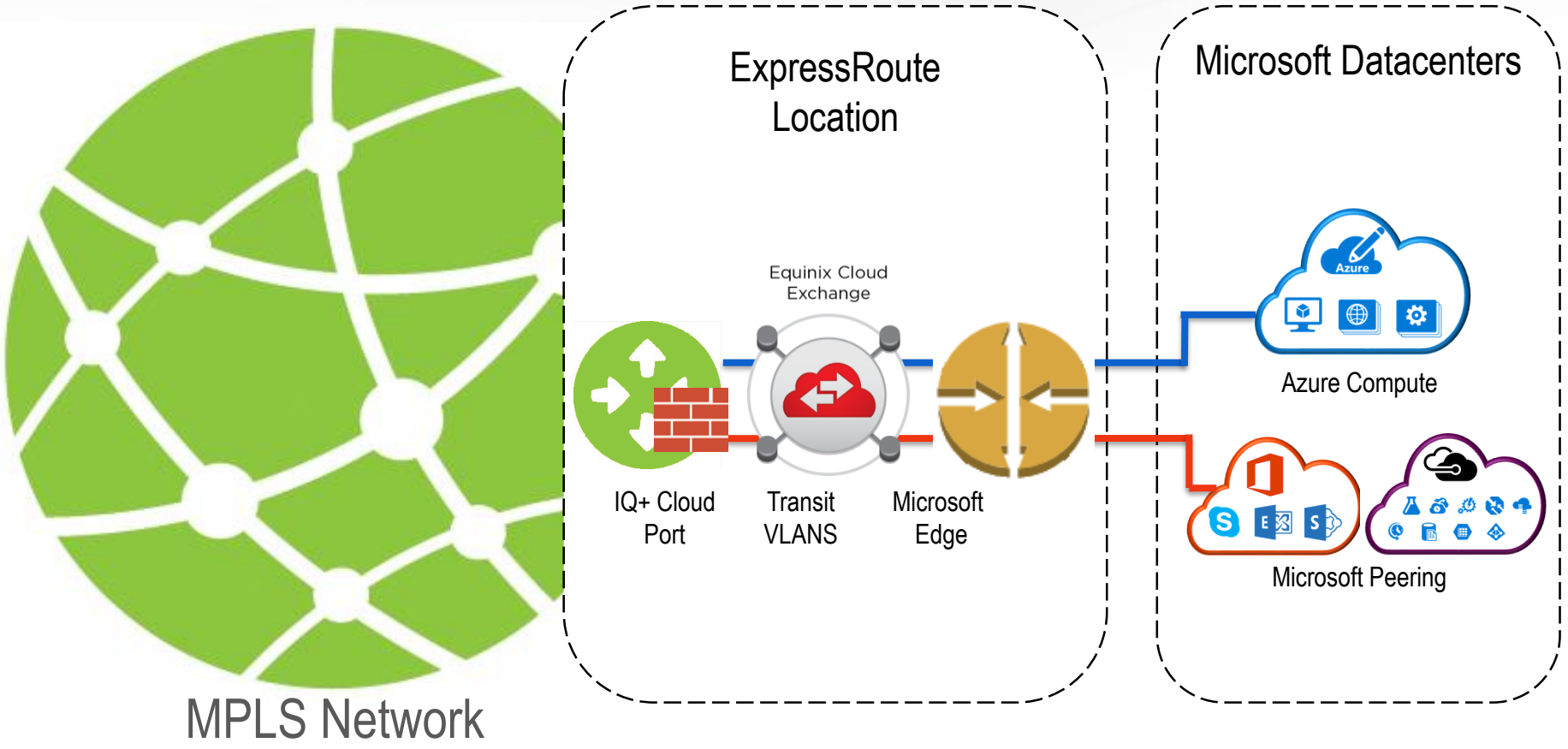
Microsoft Azure ExpressRoute lets you create private connections between Microsoft datacenters and the infrastructure that's in a co-location environment. ExpressRoute connections offer higher security, more reliability, faster speeds and lower latencies than typical connections over the Internet. In some cases, using ExpressRoute connections to transfer data between your on-premises network and Azure can also yield significant cost benefits.

Azure offers circuit bandwidths from 50 Mbps to 10 Gbps (50Mbps, 100Mbps, 200 Mbps, 500 Mbps, 1 Gbps, 2 Gbps, 5Gbps, and 10 Gbps).

Azure compute services, namely virtual machines (IaaS) and cloud services (PaaS) deployed within a virtual network can be connected through the Azure Private Peering domain.

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 Microsoft Peering routing domain. You can connect the Microsoft Peering domain to your extranet and connect to all Azure services on their public IP addresses from your WAN without having to connect through the Internet

IQ+ Cloud Port for Microsoft ExpressRoute



Current Interconnect Locations

- Ashburn, VA
- Chicago, IL
- Dallas, TX
- San Jose, CA
- Secaucus, NJ

Private Peering

Microsoft Peering

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High Level Step Review

1. Customer signs into Azure portal
2. Customer creates a new ExpressRoute circuit
3. Customer views the circuits and properties
4. Customer requests CenturyLink IQ+ Cloud Port service
5. Customer sends the service key to CenturyLink for IQ+ Cloud Port provisioning
6. Customer periodically checks the status and state of the circuit key
7. CenturyLink provisions IQ+ Cloud Port connection to MS ExpressRoute
8. Customer completes logical routing configuration

Source: https://azure.microsoft.com/en-us/documentation/articles/expressroute-howto-circuit-portal-resource-manager/

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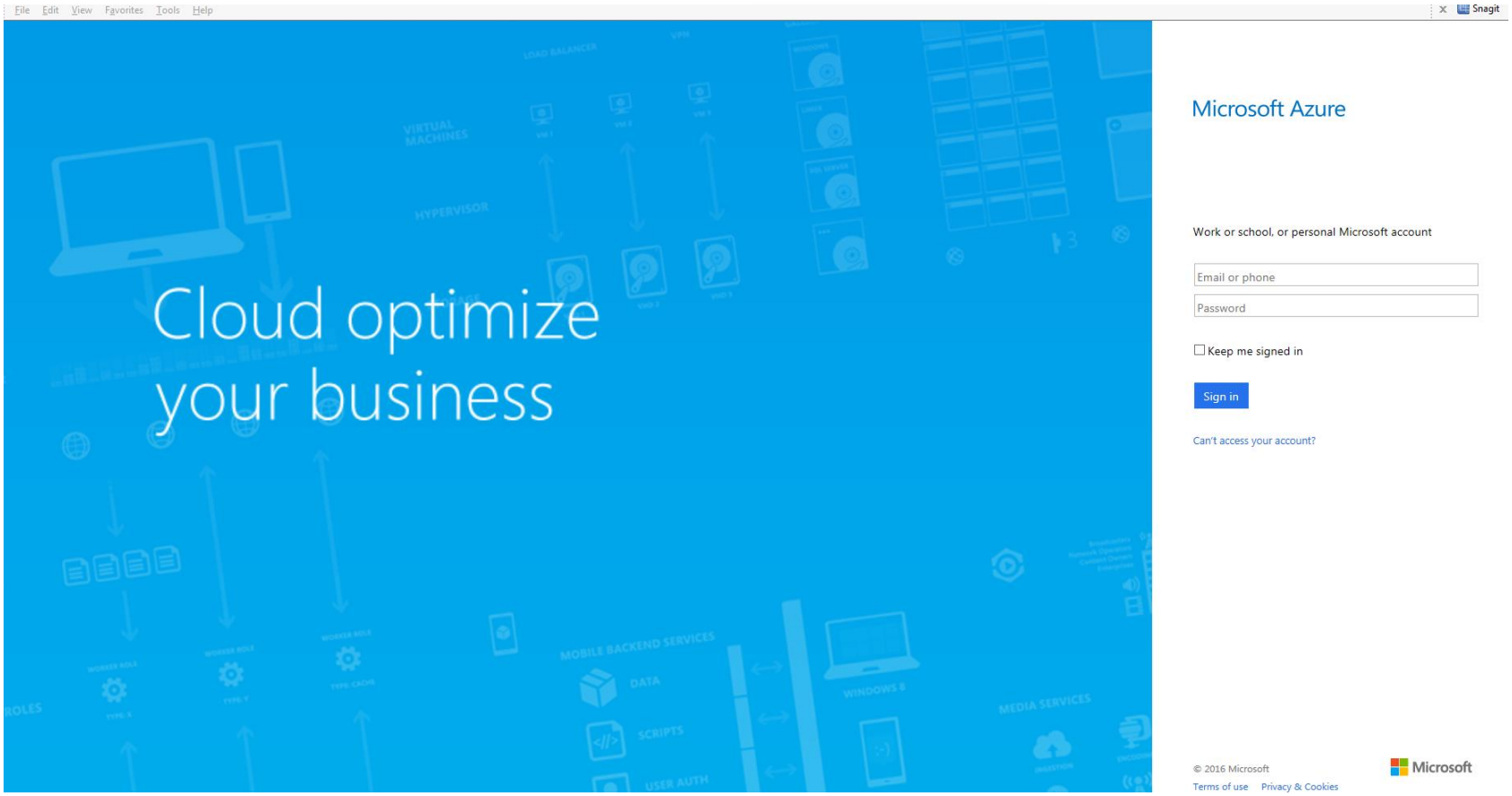
Customer signs into Azure portal

1. Sign into Azure @ http://portal.azure.com/



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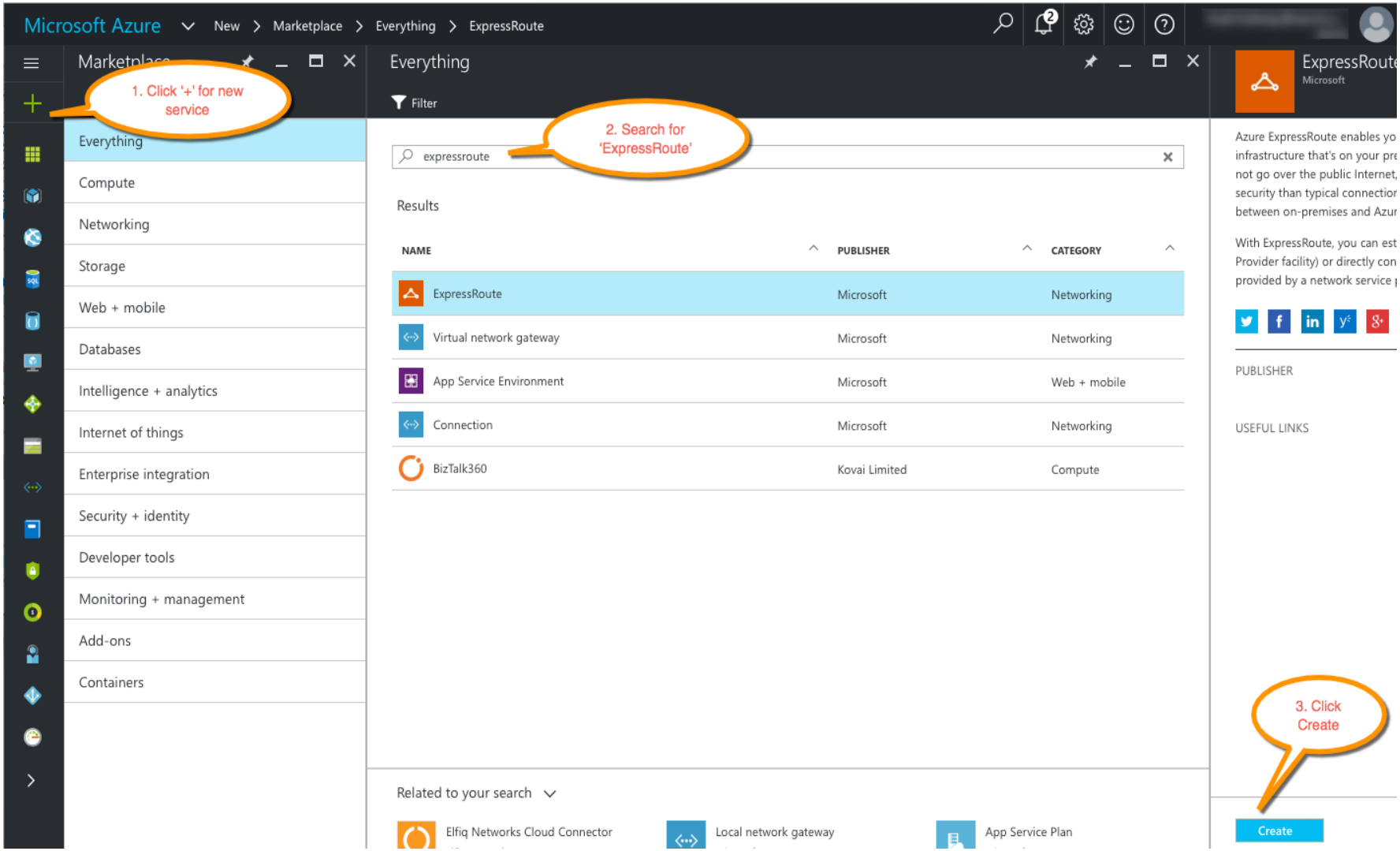
Customer creates a new ExpressRoute circuit

Create an ExpressRoute circuit by selecting the option to create a new resource.

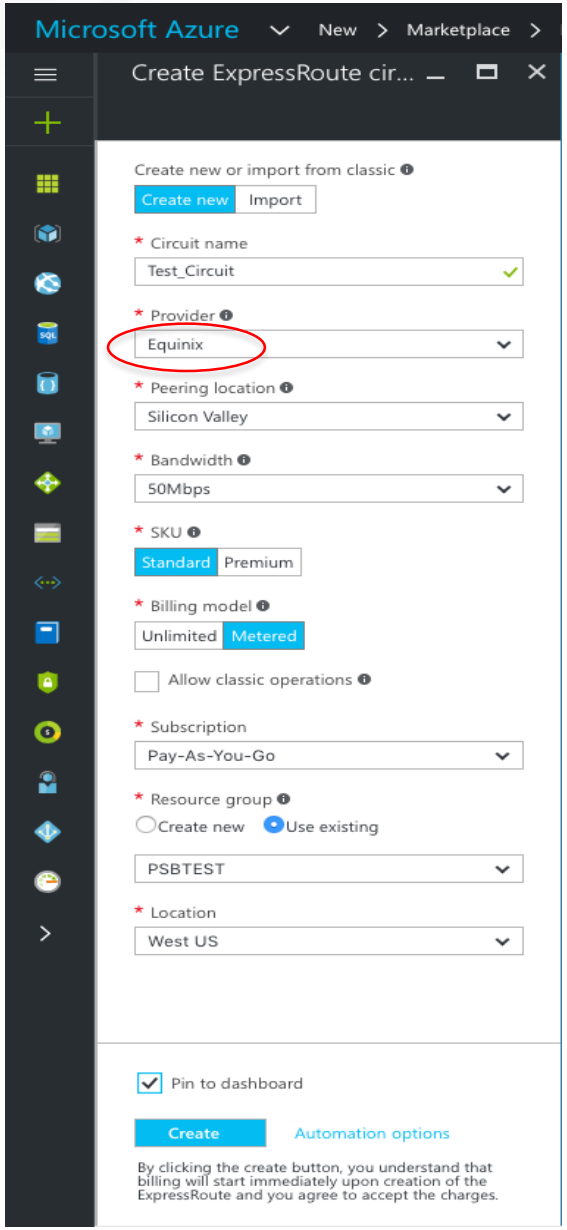


Customer creates a new ExpressRoute Circuit

After clicking ExpressRoute, portal will display **Create ExpressRoute circuit** blade. When filling in the values on this blade, some helpful tips:

- Select the Provider as **Equinix**, and available locations
  - Currently CenturyLink utilizes the Equinix Cloud Exchange for access to MSFT Azure
  - CenturyLink currently supports access to MSFT in Silicon Valley, Chicago, Dallas, Secaucus and Washington DC
- Make sure to specify the correct SKU for Tier and Data Metering:
  - **Tier** determines whether an ExpressRoute standard or an ExpressRoute premium add-on is enabled. Specify Standard to get the standard SKU or Premium for the premium add-on
  - **Data Metering** determines the billing type. Specify Metered for a metered data plan* and Unlimited for an unlimited data plan. Note that the billing type can be changed from Metered to Unlimited, but may not be changed from Unlimited to Metered
- Select the appropriate Subscription and Resource Group
  - User must have a subscription type set, such as Pay-As-You-Go
  - A Resource group is a collection of resources that share the same lifecycle, permissions, an policies.
    - Additional information can be found here: https://azure.microsoft.com/en-us/documentation/articles/resource-group-portal/
- Selecting 'Pin to dashboard' will display the ExpressRoute connection on the main Azure dashboard for easier reference

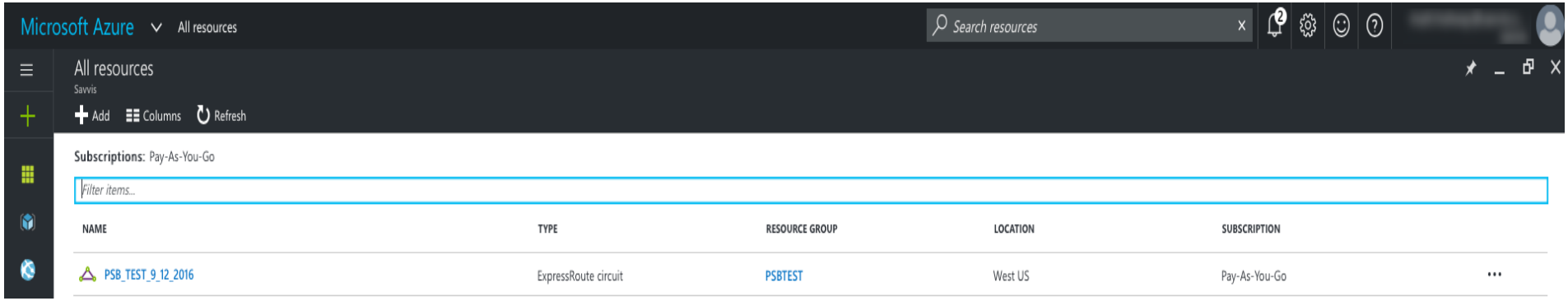
*** Most customers selected Metered to reduce the potential monthly spend**



Important:
*Please be aware that the '**Peering Location**' indicates the physical location where you are peering with Microsoft. This is not linked to "**Location**" property, which refers to the geography where the Azure Network Resource Provider is located. While they are not related, it is a good practice to choose a Network Resource Provider geographically close to the Peering Location of the circuit.*

Customer views the circuits and properties

View all created ExpressRoute circuits by selecting **All resources** on the left-side menu.



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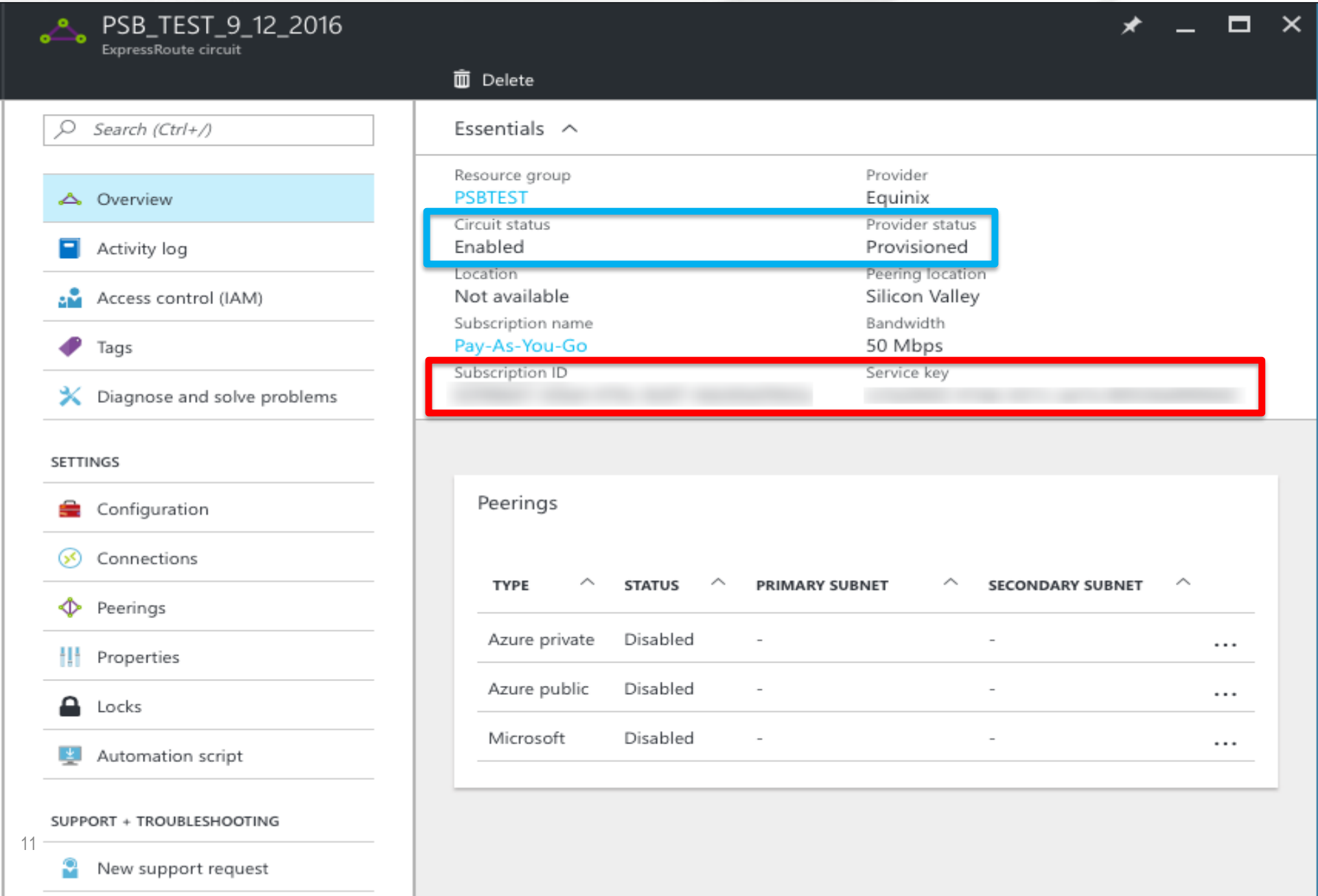
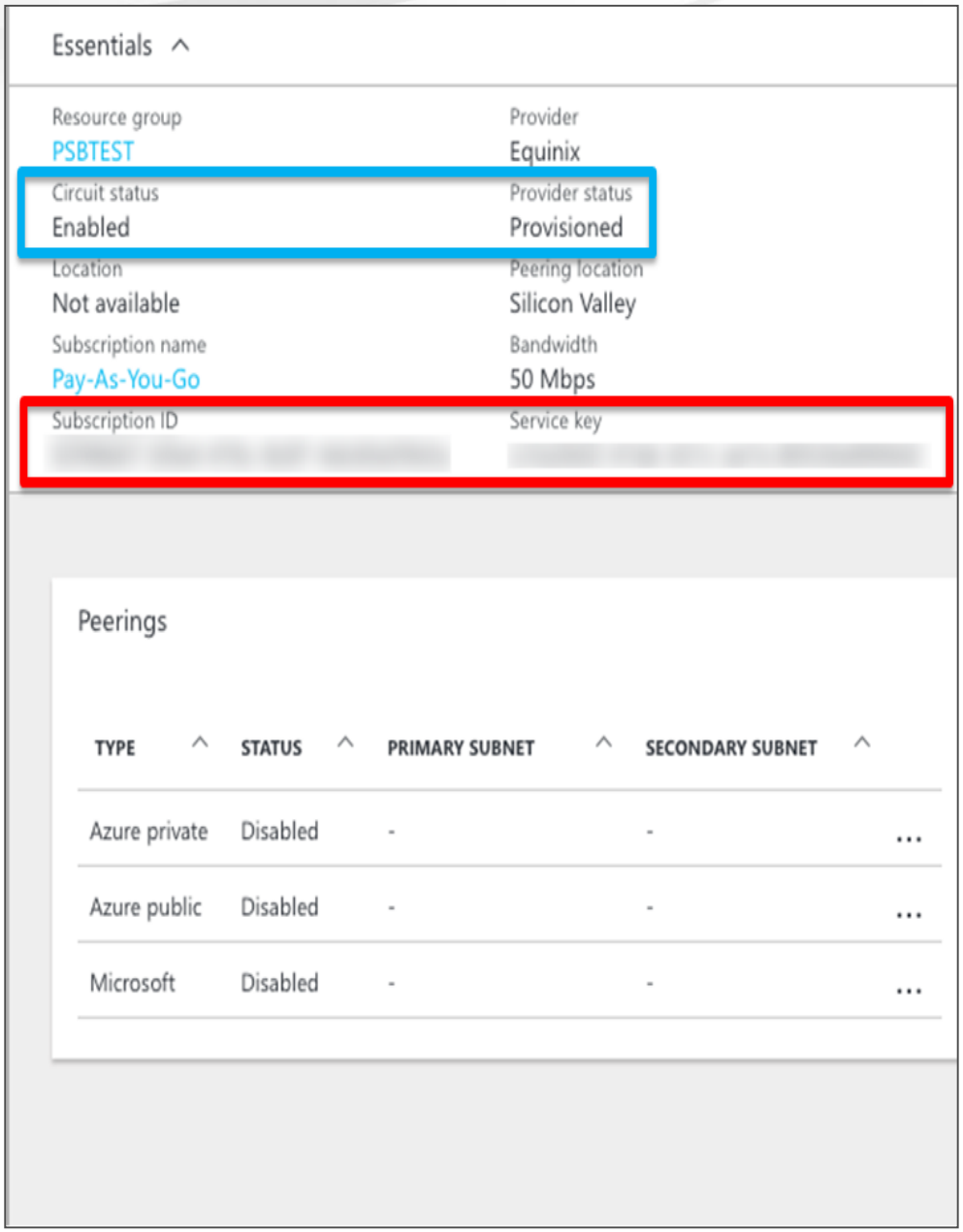
Customer views the circuits and properties



Customer sends the service key to CenturyLink for IQ+ Cloud Port for provisioning

- On this blade, Provider status provides information on the current state of provisioning on the service-provider (CenturyLink) side. Circuit status provides the state on the Microsoft side.
- When creating a new ExpressRoute circuit, the circuit will be in the following state:
  - Provider status: Not provisioned
  - Circuit status: Enabled
- The circuit will change to the following state when the connectivity provider (CenturyLink) is in the process of enabling it:
  - Provider status: Provisioning
  - Circuit status: Enabled
- To be able to use an ExpressRoute circuit, the circuit must be in the following state:
  - Provider status: Provisioned
  - Circuit status: Enabled



Customer requests CenturyLink IQ+ Cloud Port service

- **To order a CenturyLink IQ+ Cloud Port, contact your CenturyLink Account Representative**
  - Contact your CenturyLink account rep to assist in ordering an IQ+ Cloud Port
  - Information needed by CenturyLink to complete connection:
    - MSFT Azure ExpressRoute Service Key completed in early steps
    - Azure Interconnect Location
    - Speed of MPLS Connection requested (typically matches ExpressRoute speed)
  - What Azure service(s) are you connecting to:
    - Azure Private Peering (Compute/IaaS)
    - Microsoft Peering (Azure PaaS, Office 365, Dynamics 365)
  - Don’t forget to discuss available billing modes including flat and precise burstable

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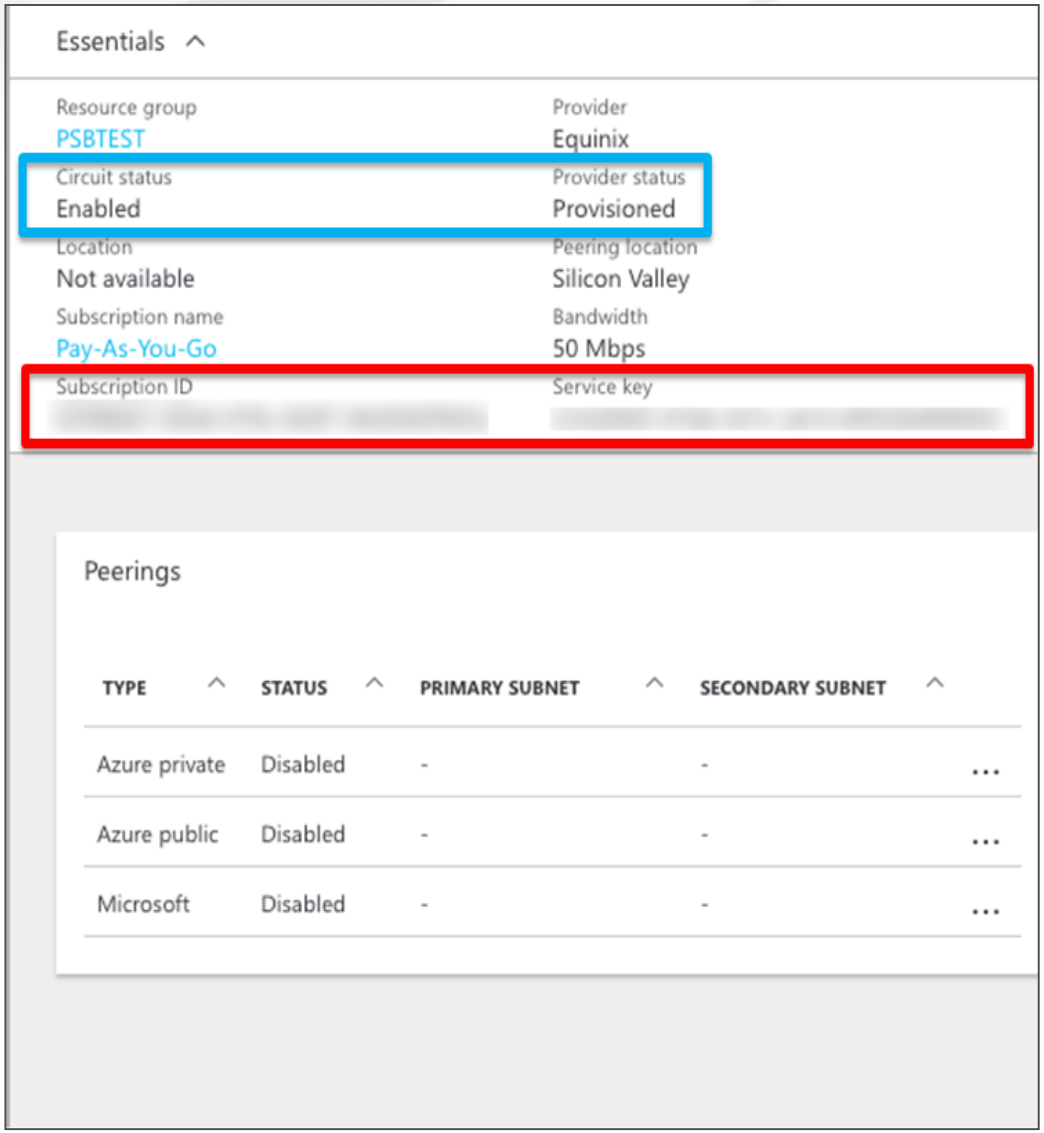
Customer periodically checks status and state of the circuit key

- To view the properties of an ExpressRoute circuit, select it, then check the Provider status and ensure that it has moved to **Provisioned** before continuing.



CenturyLink provisions IQ+ Cloud Port to MS ExpressRoute

- **Upon network order submission, CenturyLink will provision a Layer 3 VPN connection to the requested interconnect point**
  - Turn up of Layer 3 VPN service to local ExpressRoute interconnect point
    - Layer 3 will be configured on CTL side; Customer will complete Layer 3 turn up on Azure side in a later step
  - Extension of Layer 2 VLAN(s) between CenturyLink and Microsoft

- **CenturyLink completes configuration, and provides Customer with necessary information required to complete Layer 3 turn up on Azure side per environment**
  - Primary & Secondary IP subnets
  - Autonomous System Number (ASN) Info
  - VLAN ID

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Configuring ExpressRoute for Azure Private

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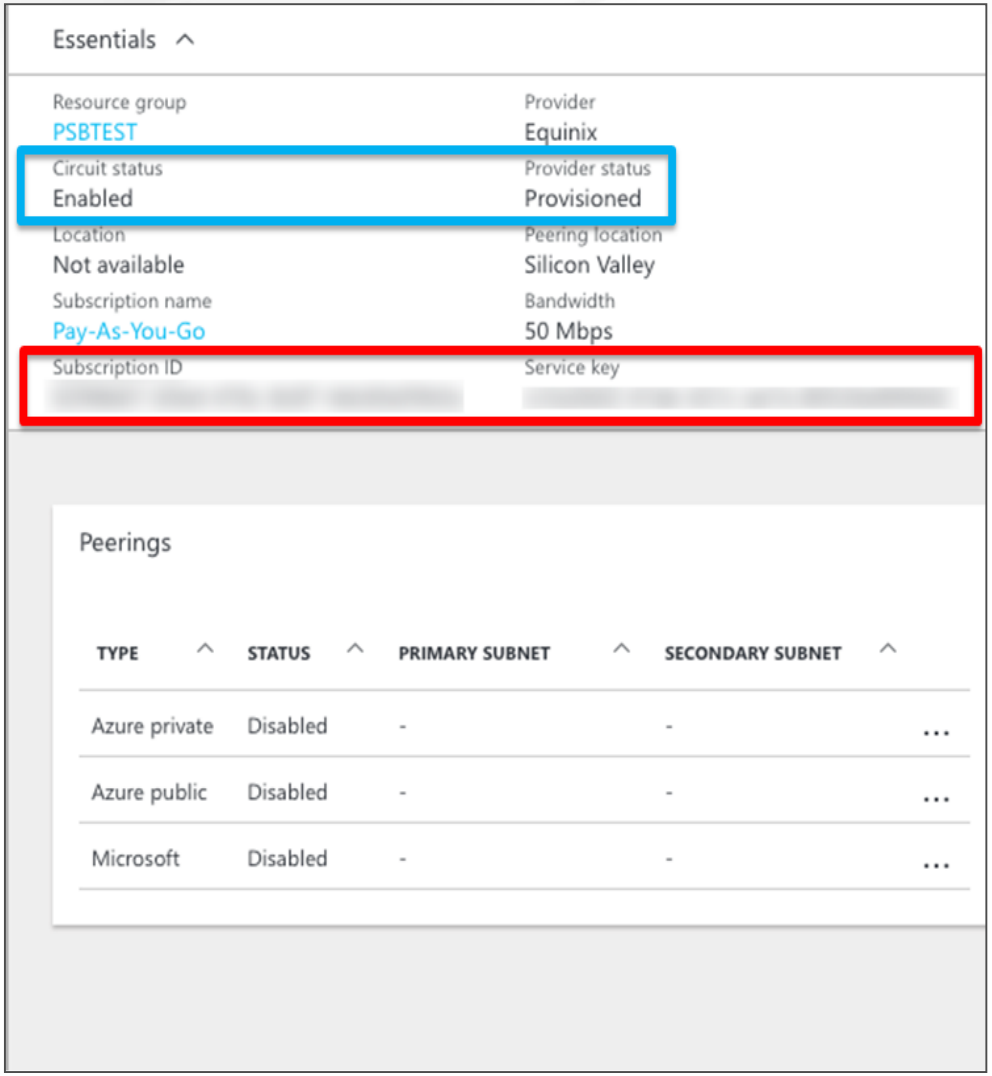
Configuring ExpressRoute for Azure Private

To create Azure Private Peering:

1. Configure the ExpressRoute circuit. Ensure that the circuit is fully provisioned by CenturyLink before continuing.
2. Configure Azure private peering for the circuit. Make sure to have the following items before proceeding with the next steps:
   - A /30 subnet for the primary link. This must not be part of any address space reserved for virtual networks.
   - A /30 subnet for the secondary link. This must not be part of any address space reserved for virtual networks.
   - A valid VLAN ID to establish this peering on. Ensure that no other peering in the circuit uses the same VLAN ID.
   - AS number for peering. Both 2-byte and 4-byte AS numbers can be used. A private AS number for this peering can be used. Do not use ASN 65515.
   - An MD5 hash is optional.



Source: https://azure.microsoft.com/en-us/documentation/articles/expressroute-howto-routing-portal-resource-manager/

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

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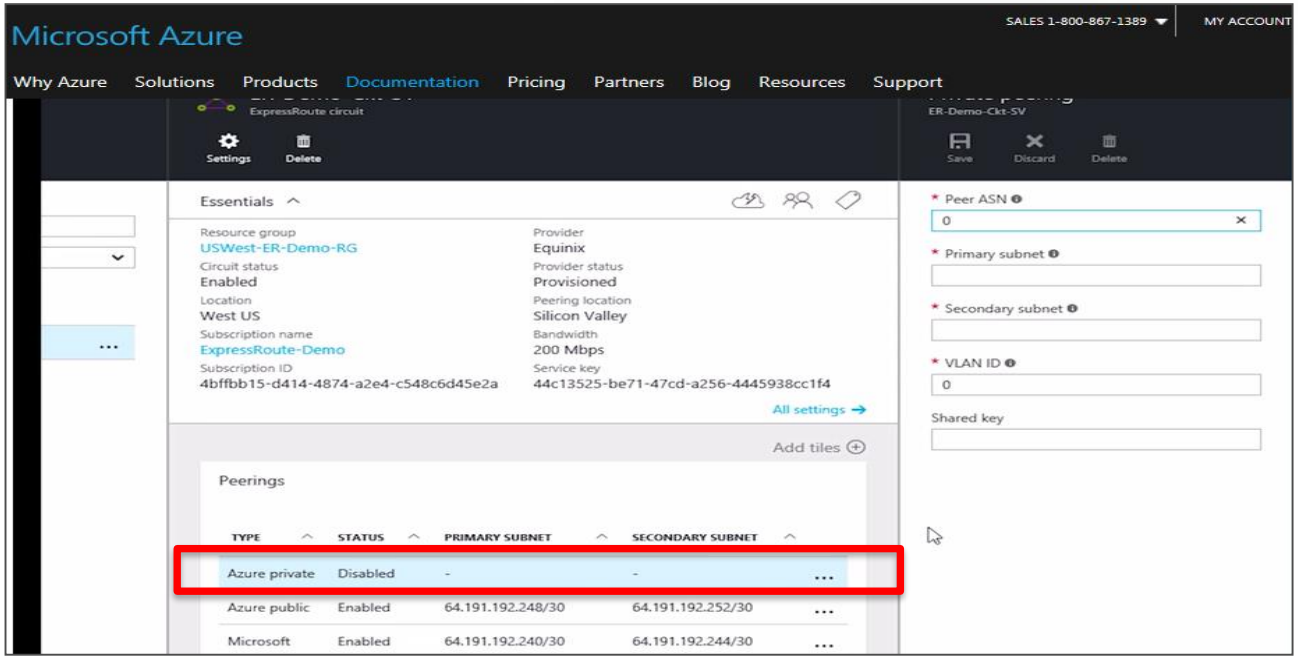
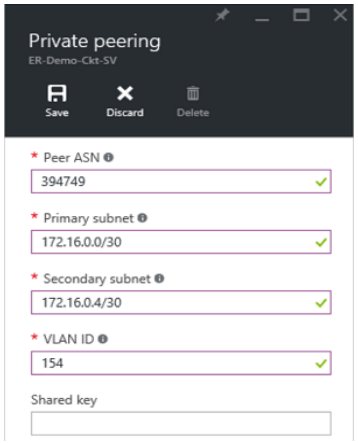
Configuring ExpressRoute for Azure Private

To create Azure Private Peering (cont'd):

3. **Select the Azure Private peering row, as shown below**



4. **Configure private peering**



Source: https://azure.microsoft.com/en-us/documentation/articles/expressroute-howto-routing-portal-resource-manager/

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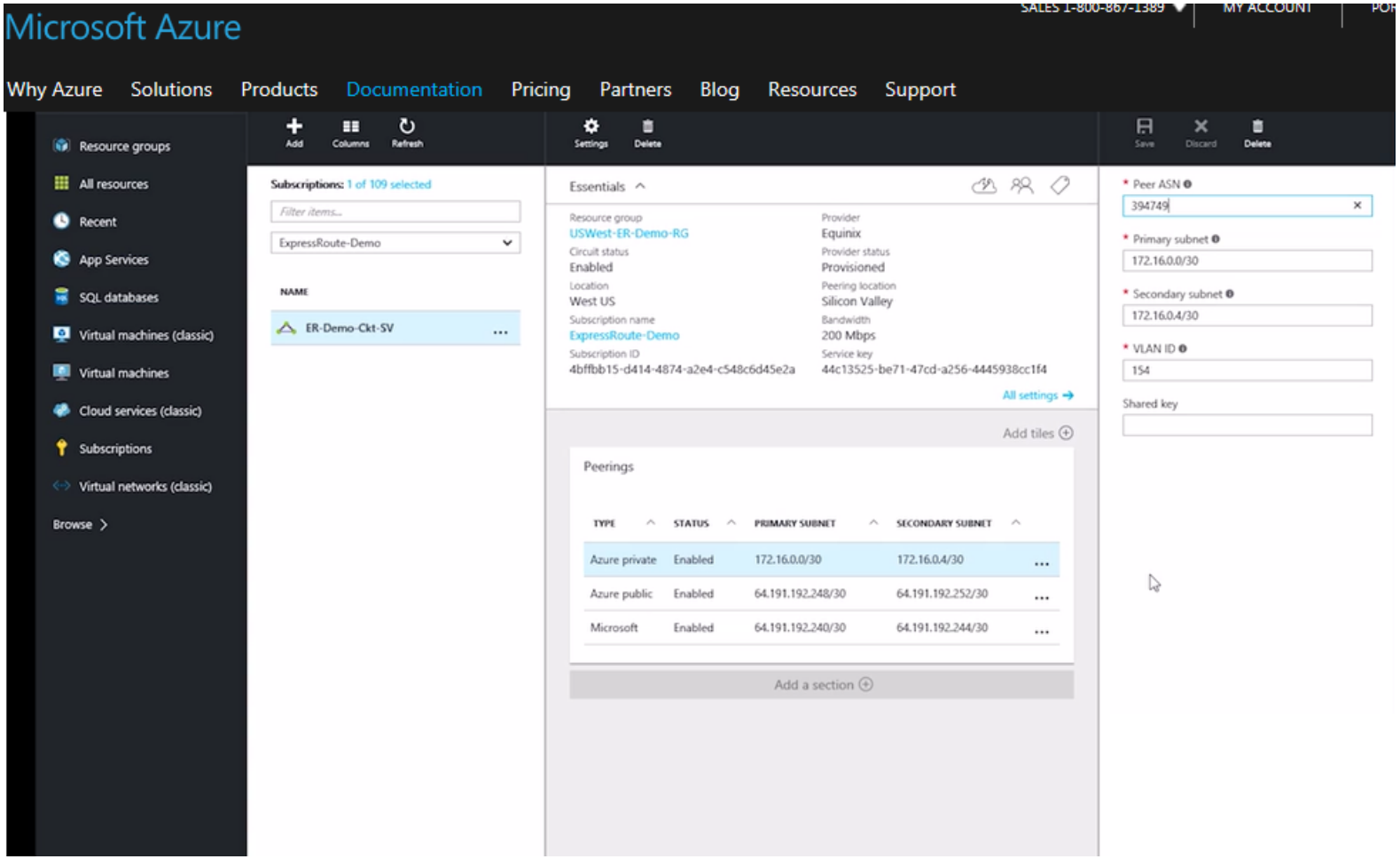
Configuring ExpressRoute for Azure Private

To create Azure Private Peering (cont'd):

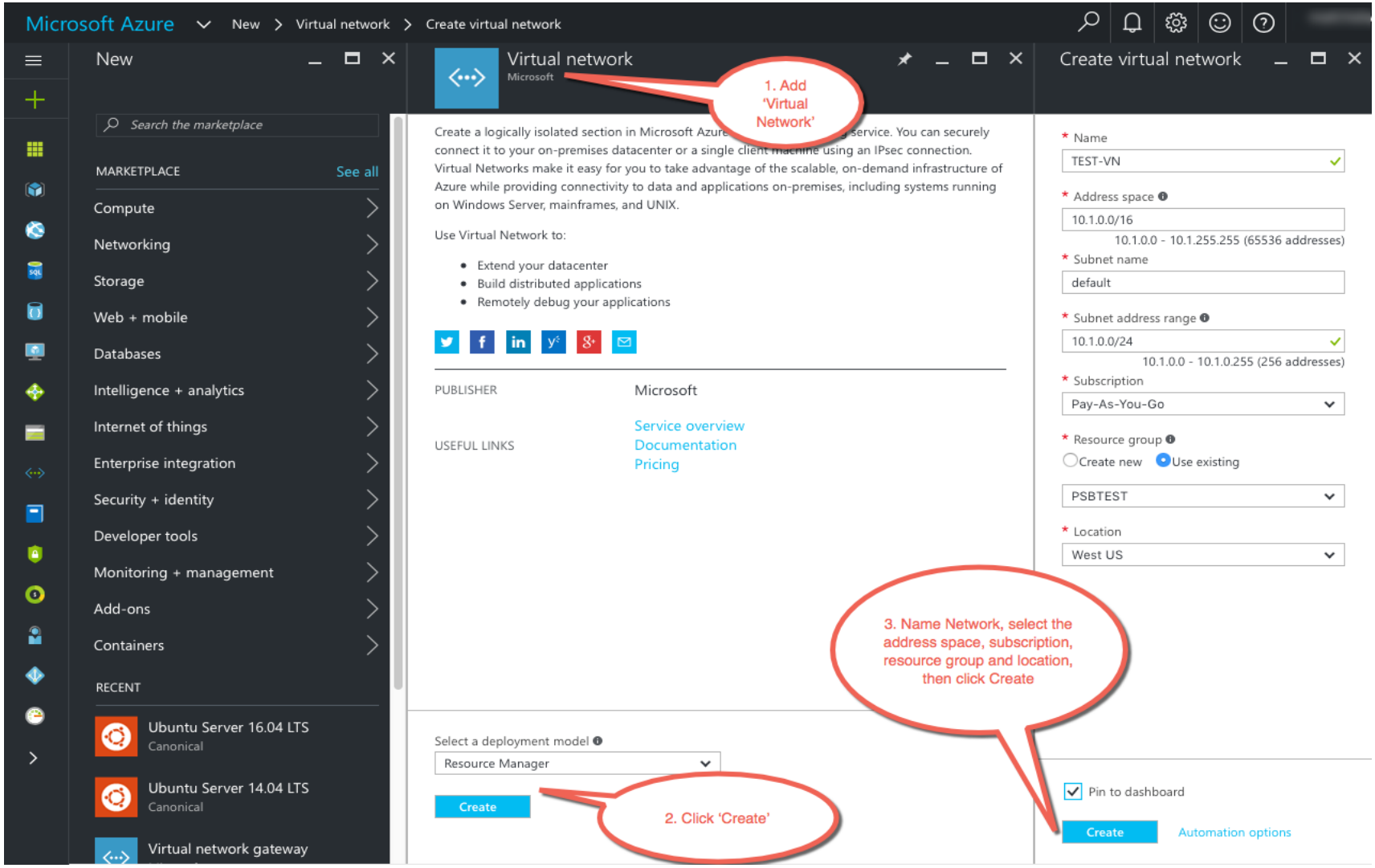
5. Save the configuration once you have specified all parameters. Once the configuration has been accepted successfully, the portal will display something similar to the example below.



Source: https://azure.microsoft.com/en-us/documentation/articles/expressroute-howto-routing-portal-resource-manager/

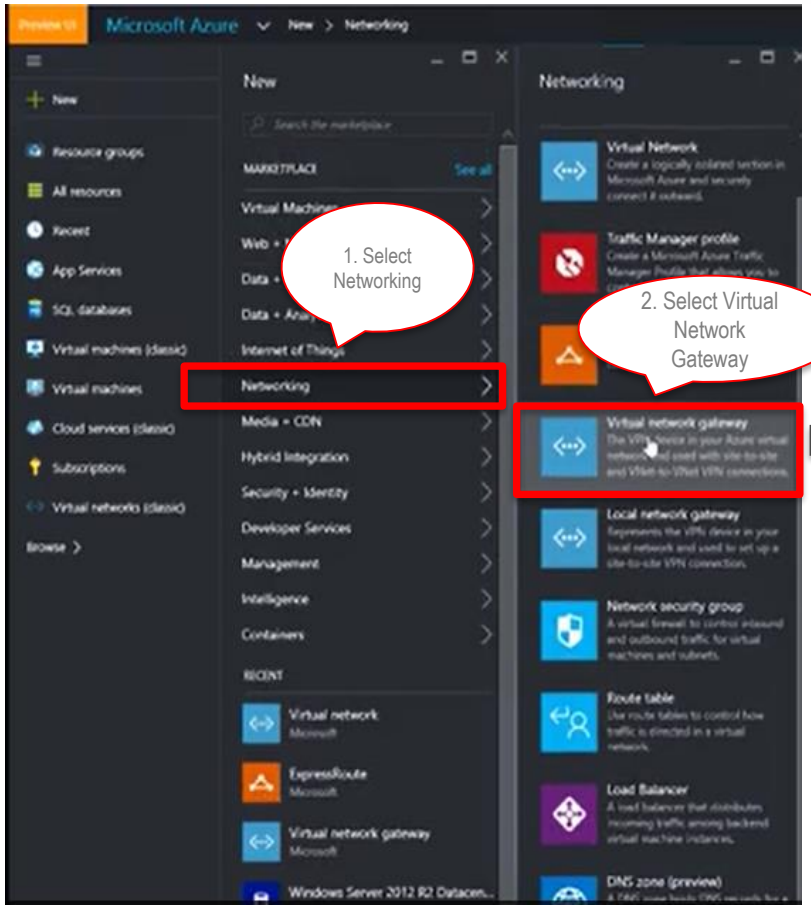
Create Virtual Network

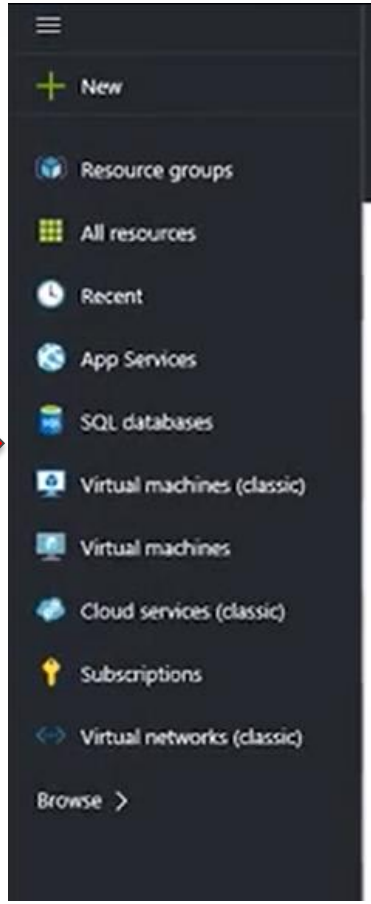
- If not already created, customer must have a virtual network that will be used for their compute resources (aka the LAN)

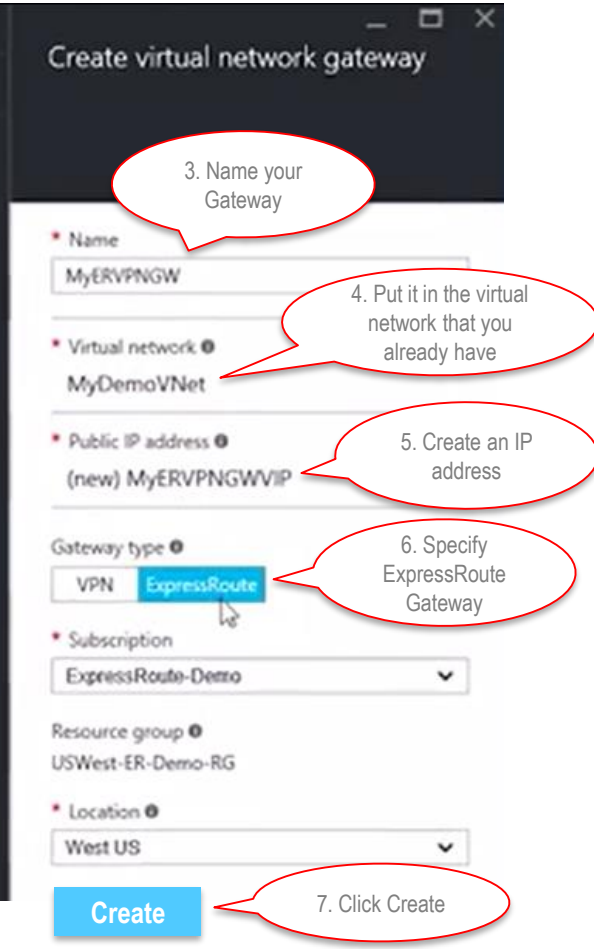


Create Virtual Network Gateway

- Create a Virtual Network Gateway that will be used to connect the Virtual Network to the ExpressRoute
  - Virtual Network Gateway FAQs at https://docs.microsoft.com/en-us/azure/expressroute/expressroute-about-virtual-network-gateways







Tutorial: https://azure.microsoft.com/en-us/documentation/videos/azure-expressroute-how-to-create-a-vpn-gateway-for-your-virtual-network/

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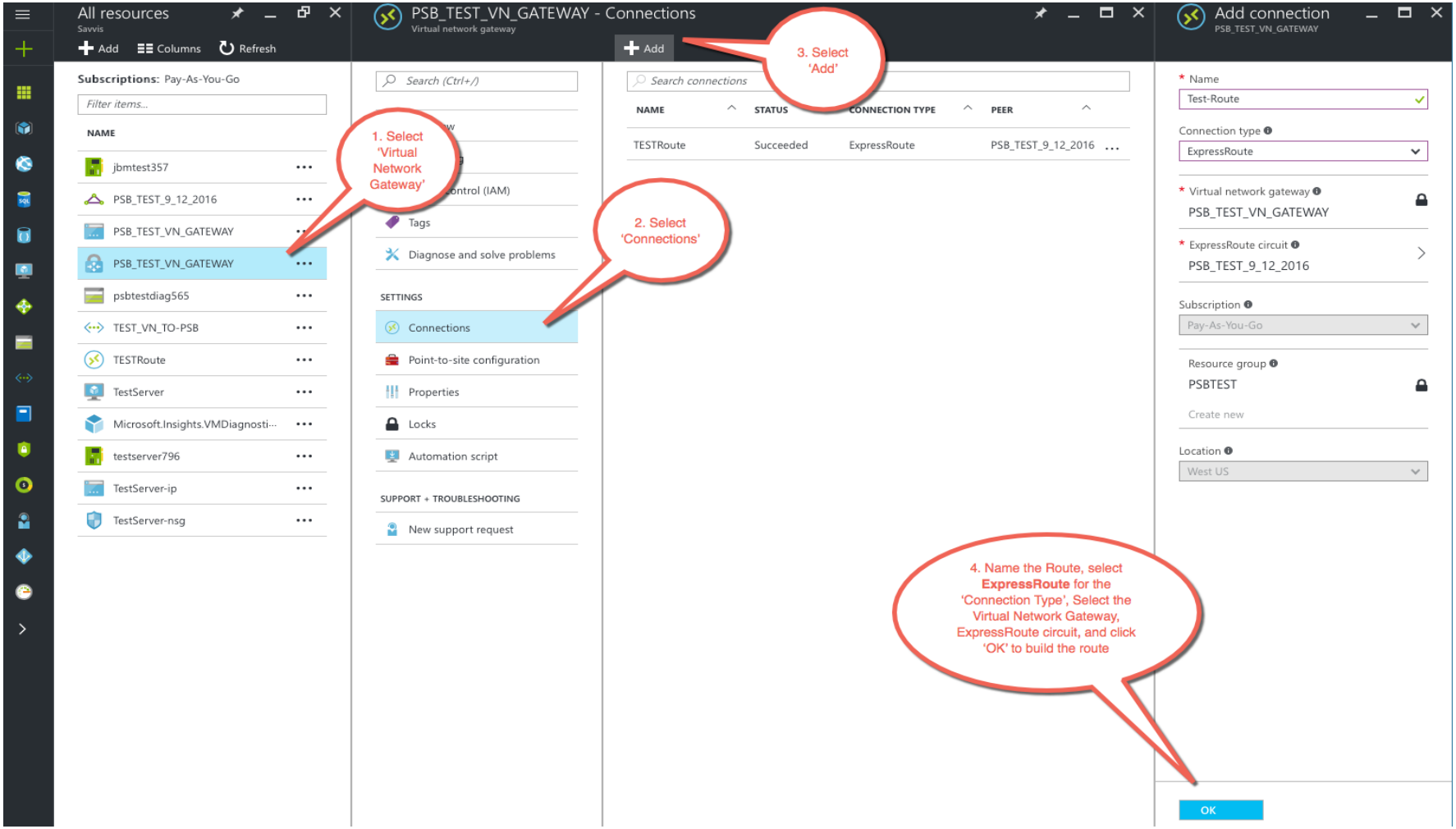
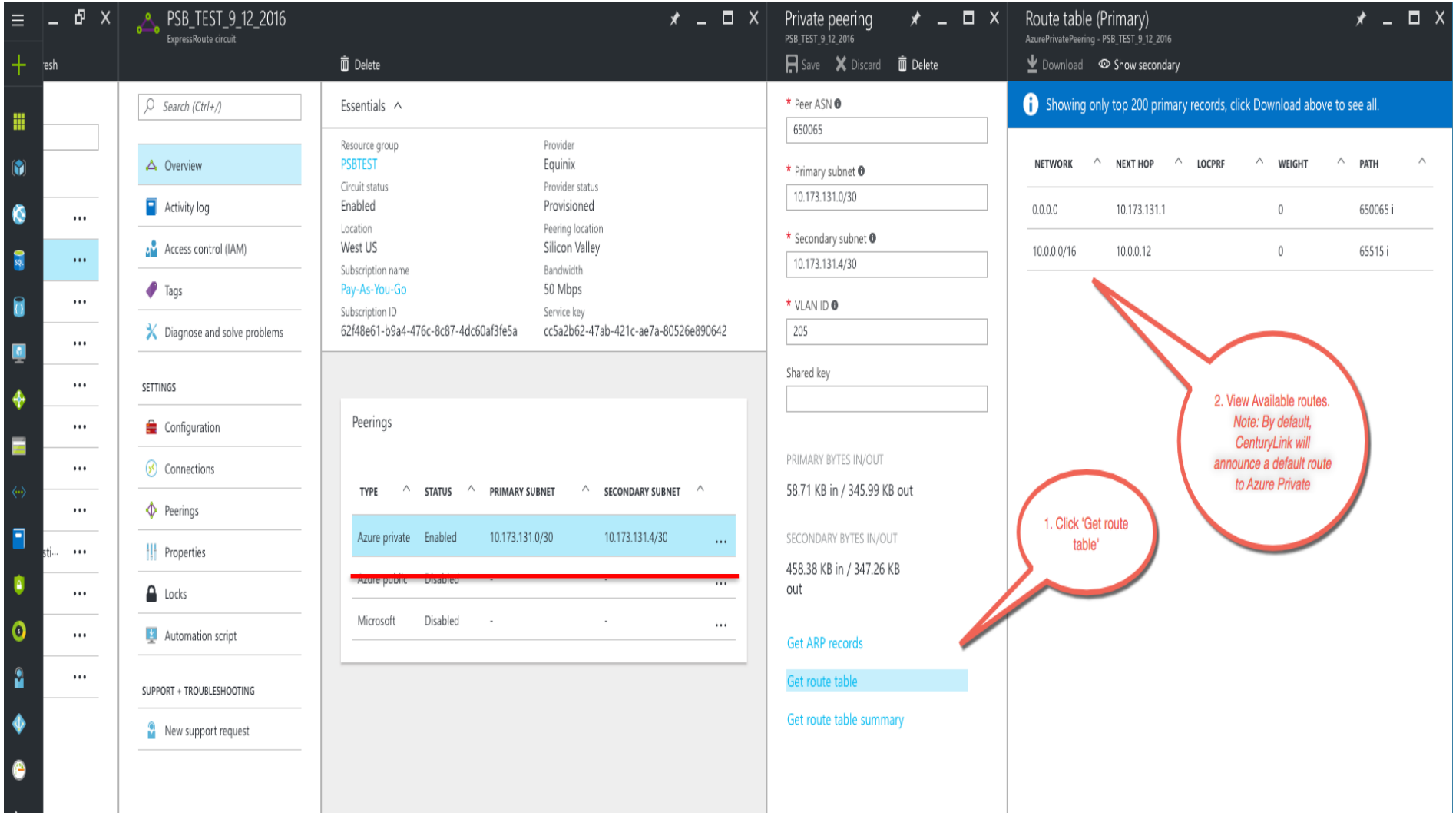
Create Connection from Virtual Network Gateway to Virtual Network

- To enable routing between the MPLS network and the compute resources on the Virtual Network, create a connection between the Virtual Network Gateway



Verify Routes between CenturyLink and Azure Private

- Verify routes are being seen by Azure Private



Configuring ExpressRoute for Microsoft Peering

As of 4/01/18 Microsoft Peering consists of

- Azure PaaS
- Office 365
- Dynamics 365

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Microsoft Peering (SaaS) now supports Azure Public (PaaS) services

- Microsoft has announced they are combining both their PaaS/SaaS services over a single connection (Microsoft Peering)

- Before April 1, 2018, ExpressRoute had three peering connections:
  - **Azure Private** peering for connecting to Azure Vnets
  - **Azure Public** (PaaS) peering to reach Azure PaaS services
  - **Microsoft Peering** (SaaS) for Office 365 and Dynamics 365

- To simplify ExpressRoute management and configuration Microsoft has merged Azure Public routes into the Microsoft Peering connection
  - Customers can now access Azure PaaS and Microsoft SaaS services via the Microsoft peering connection
    - Customers no longer have to have 3 separate connections to MSFT (Public / Private / MSFT Peering), but rather 2 connections going forward (Private / MSFT Peering)
    - Refer to the following to **move** a Public peering to Microsoft peering: https://docs.microsoft.com/en-us/azure/expressroute/how-to-move-peering

- **Note:** While customers can receive all PaaS/SaaS services over MSFT Peering, the O365 service still requires customers to apply for approval to enable the O365 service via their ExpressRoute. All other services can be accessed via the MSFT Peering VLAN without a prior approval.

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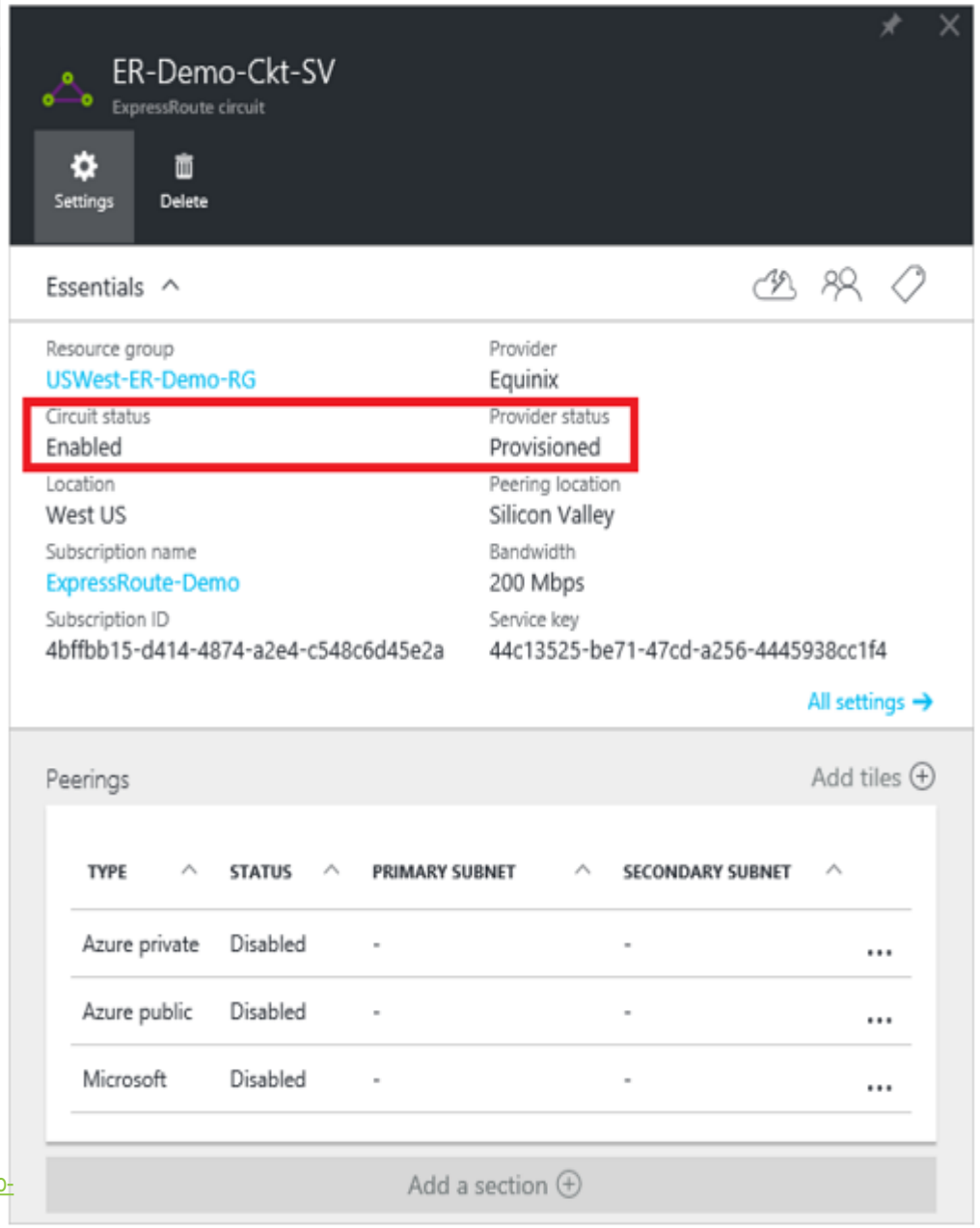
Configuring ExpressRoute for Microsoft Peering

To create Microsoft Peering:

1. Configure the ExpressRoute circuit. Ensure that the circuit is fully provisioned by CenturyLink before continuing.
2. Configure Microsoft peering for the circuit. Make sure to have the following items before proceeding with the next steps:
   - A /30 subnet for the primary link. This must be a customer-owned valid public IPv4 and registered in an RIR / IRR.
   - A /30 subnet for the secondary link. This must be a customer-owned valid public IPv4 prefix and registered in an RIR / IRR.
   - A valid VLAN ID to establish this peering on. Ensure that no other peering in the circuit uses the same VLAN ID.
   - AS number for peering. 2-byte and 4-byte AS numbers may be used.
   - Advertised prefixes: Provide a list of all prefixes to be advertised over the BGP session. Only public IP address prefixes are accepted. Send a comma separated list if you plan to send a set of prefixes. These prefixes must be registered to the customer in an RIR / IRR.
   - Customer ASN: If advertising prefixes that are not registered to the peering AS number, specify the AS number to which they are registered. This is optional.
   - Routing Registry Name: Specify the RIR / IRR against which the AS number and prefixes are registered. This is optional.
   - An MD5 hash is optional.



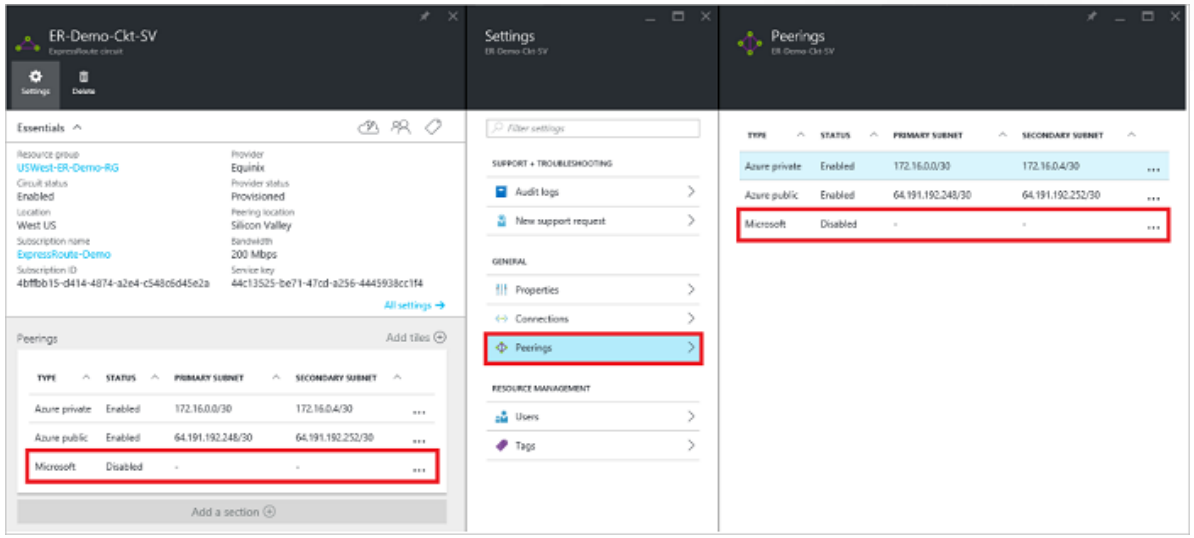
Source: https://azure.microsoft.com/en-us/documentation/articles/expressroute-howto-routing-portal-resource-manager/

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

Configuring ExpressRoute for Microsoft Peering

To create Microsoft Peering (cont'd):

3. **Select the Microsoft peering row, as shown below**



4. **Configure Microsoft peering**

Source: https://azure.microsoft.com/en-us/documentation/articles/expressroute-howto-routing-portal-resource-manager/

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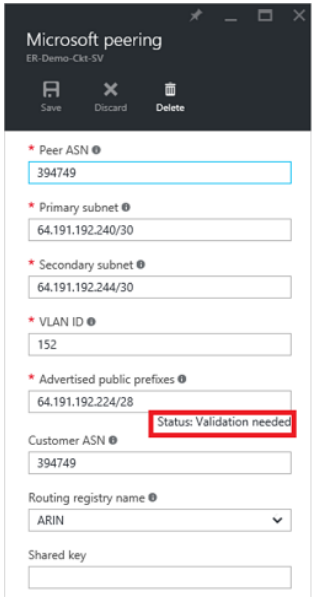
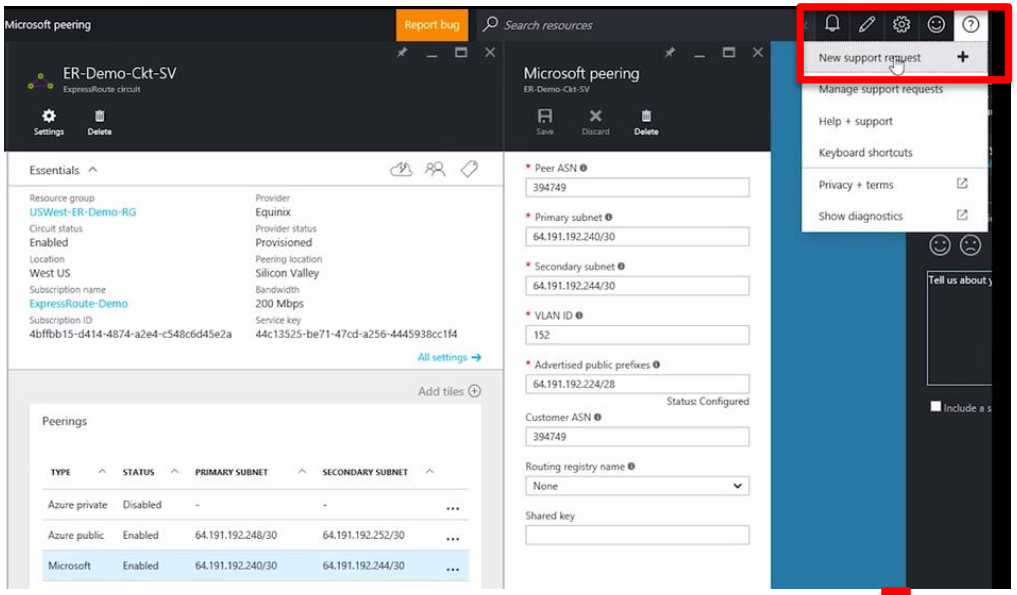
Configuring ExpressRoute for Microsoft Peering

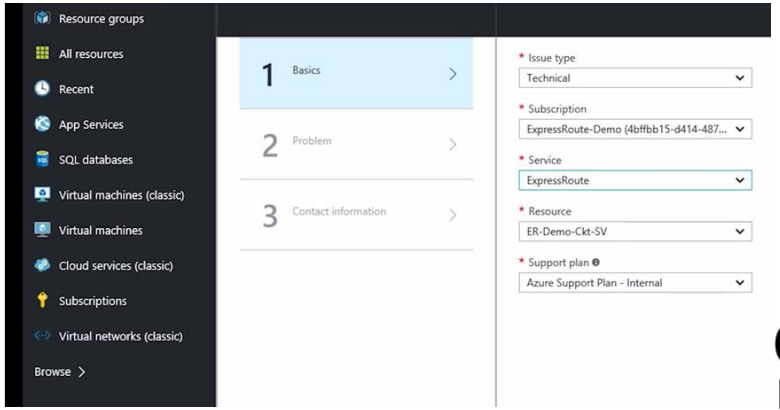
To create Microsoft Peering (cont'd):

5. **Save the configuration once all parameters have been specified. If the circuit gets to a Validation needed state (as shown below), you must open a support ticket with MSFT to show proof of ownership of the prefixes to their support team.**





A support ticket can be opened directly from the portal as shown at right



Source: https://azure.microsoft.com/en-us/documentation/articles/expressroute-howto-routing-portal-resource-manager/

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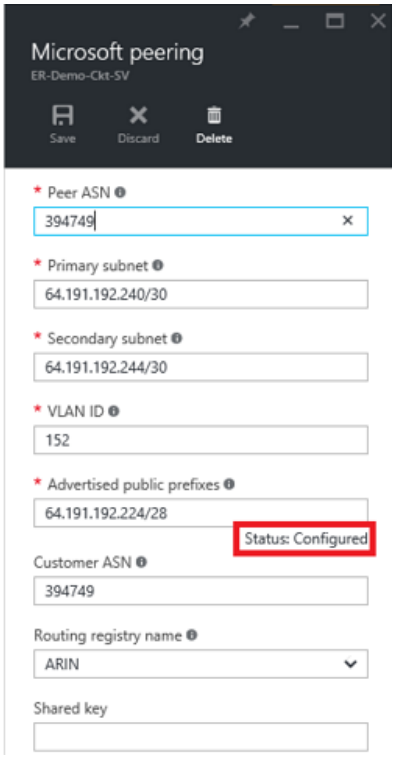
Configuring ExpressRoute for Microsoft Peering

To create Microsoft Peering (cont'd):

6. **Once the configuration has been accepted successfully, the portal will display something similar to the example below.**



7. **To set up Office 365 services refer to** https://support.office.com/en-us/article/Deploy-Office-365-Enterprise-for-your-organization-ee73dafb-be54-492e-bcfd-0fbfb5f65e94?ui=en-US&rs=en-US&ad=US.

Source: https://azure.microsoft.com/en-us/documentation/articles/expressroute-howto-routing-portal-resource-manager/

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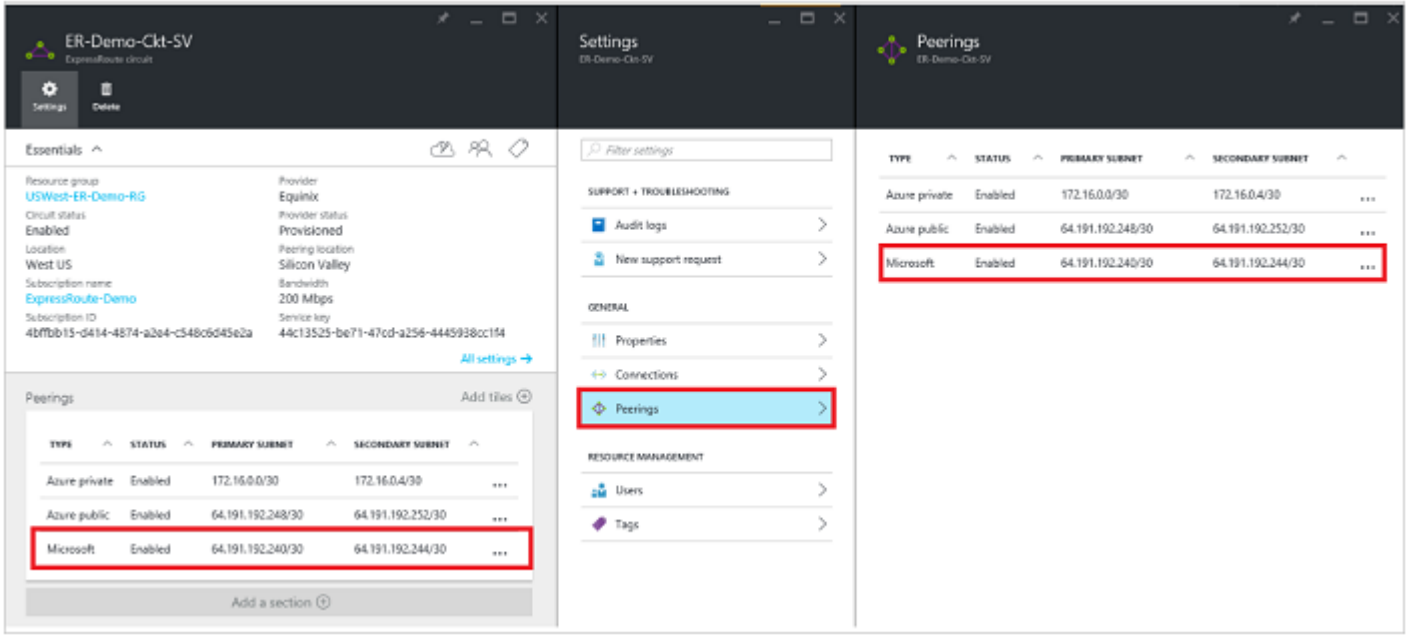
Configuring ExpressRoute for Microsoft Peering

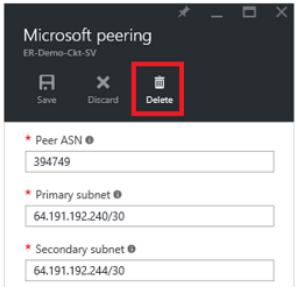
To view Microsoft Peering details:

You can view the properties of Azure public peering by selecting the peering.



To delete Microsoft peering

You can remove your peering configuration by selecting the delete icon, as shown in the following image:



Source: https://azure.microsoft.com/en-us/documentation/articles/expressroute-howto-routing-portal-resource-manager/

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Configuring Route Filters for Microsoft Peering

About route filters

When Microsoft peering is configured on your ExpressRoute circuit, the Microsoft edge routers establish a pair of BGP sessions with the edge routers (yours or your connectivity provider's). No routes are advertised to your network. To enable route advertisements to your network, you must associate a route filter.

A route filter lets you identify services you want to consume through your ExpressRoute circuit's Microsoft peering. It is essentially a white list of all the BGP community values. Once a route filter resource is defined and attached to an ExpressRoute circuit, all prefixes that map to the BGP community values are advertised to your network.

To be able to attach route filters with Office 365 services on them, you must have authorization to consume Office 365 services through ExpressRoute. If you are not authorized to consume Office 365 services through ExpressRoute, the operation to attach route filters fails. For more information about the authorization process, see Azure ExpressRoute for Office 365. Connectivity to Dynamics 365 services does NOT require any prior authorization.

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Overview

- Route filters are a way to consume a subset of supported services through Microsoft peering
- The steps in this section help you configure and manage route filters for ExpressRoute circuits

Dynamics 365 services, and Office 365 services such as Exchange Online, SharePoint Online, and Skype for Business, and Azure services such as storage and SQL DB are accessible through Microsoft peering. When Microsoft peering is configured in an ExpressRoute circuit, all prefixes related to these services are advertised through the BGP sessions that are established. A BGP community value is attached to every prefix to identify the service that is offered through the prefix. For a list of the BGP community values and the services they map to, see BGP communities.

If you require connectivity to all services, a large number of prefixes are advertised through BGP. This significantly increases the size of the route tables maintained by routers within your network. If you plan to consume only a subset of services offered through Microsoft peering, you can reduce the size of your route tables in two ways. You can:

- Filter out unwanted prefixes by applying route filters on BGP communities. This is a standard networking practice and is used commonly within many networks.
- Define route filters and apply them to your ExpressRoute circuit. A route filter is a new resource that lets you select the list of services you plan to consume through Microsoft peering. ExpressRoute routers only send the list of prefixes that belong to the services identified in the route filter.

Source: https://azure.microsoft.com/en-us/documentation/articles/expressroute-howto-circuit-portal-resource-manager/

Workflow

- To be able to successfully connect to services through Microsoft peering, you must complete the following configuration steps:

  - You must have an active ExpressRoute circuit that has Microsoft peering provisioned
    You can use the following instructions to accomplish these tasks:
    - Create an ExpressRoute circuit and have the circuit enabled by your connectivity provider before you proceed. The ExpressRoute circuit must be in a provisioned and enabled state.
    - Create Microsoft peering if you manage the BGP session directly. Or, have your connectivity provider provision Microsoft peering for your circuit.

  - You must create and configure a route filter
    - Identify the services you with to consume through Microsoft peering
    - Identify the list of BGP community values associated with the services
    - Create a rule to allow the prefix list matching the BGP community values

  - You must attach the route filter to the ExpressRoute circuit

Source: https://azure.microsoft.com/en-us/documentation/articles/expressroute-howto-circuit-portal-resource-manager/

Configuring Route Filters for Microsoft Peering

1. Get a list of BGP community values
   - BGP community values associated with services accessible through Microsoft peering are available in the ExpressRoute routing requirements page at:
     https://docs.microsoft.com/en-us/azure/expressroute/expressroute-routing

Example Community Strings

Microsoft Azure Region	BGP Community Value
North America	
East US	12076:51004
East US 2	12076:51005
West US	12076:51006
West US 2	12076:51026
West Central US	12076:51026
North Central US	12076:51007
South Central US	12076:51008
Central US	12076:51009
Canada Central	12076:51020
Canada East	12076:51021

Microsoft Service	BGP Community Value
Exchange Online	12076:5010
SharePoint Online	12076:5020
Skype For Business Online	12076:5030
Dynamics 365	12076:5040
Other Office 365 Online services	12076:5100

2. Make a list of the values that you want to use
   - Make a list of BGP community values you want to use in the route filter. As an example, the BGP community value for Dynamics 365 services is 12076:5040

Source: https://docs.microsoft.com/en-us/azure/expressroute/how-to-routefilter-portal

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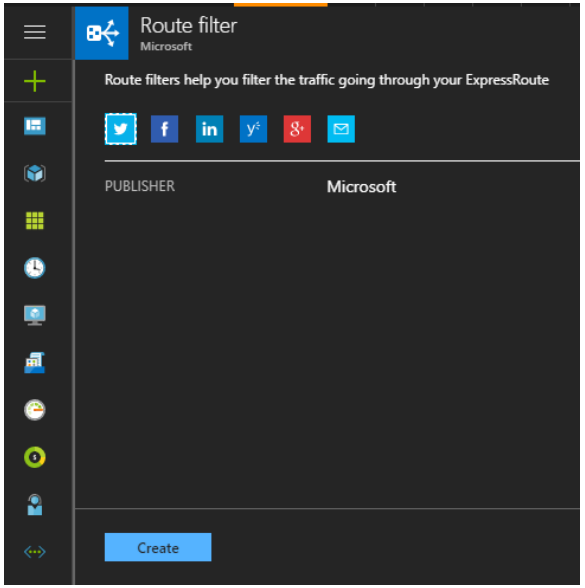
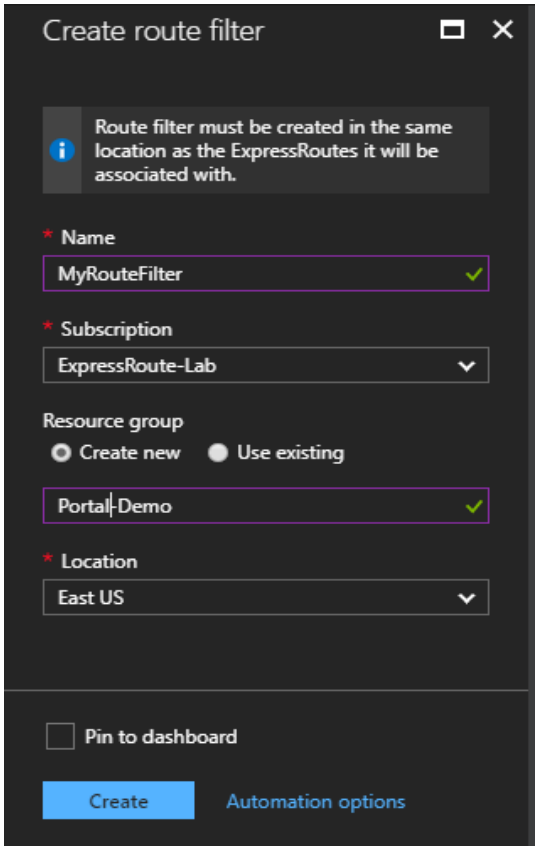
Configuring Route Filters for Microsoft Peering

1. Create a route filter

   - You can create a route filter by selecting the option to create a new resource. Click **New > Networking > Route Filter**, as shown in the following image:.



   - You must place the route filter in a resource group

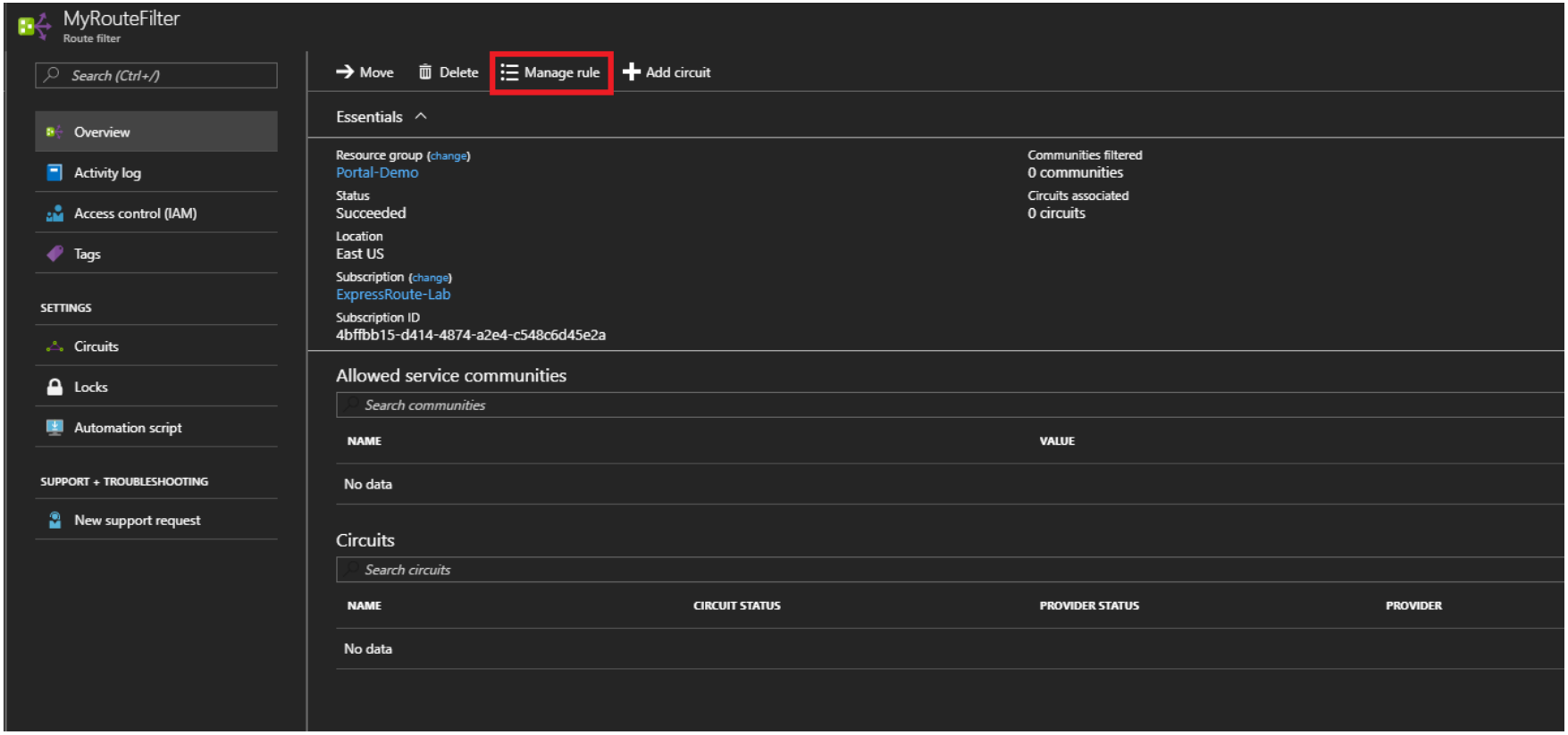


Source: https://docs.microsoft.com/en-us/azure/expressroute/how-to-routefilter-portal

Configuring Route Filters for Microsoft Peering

2. Create a filter rule

- You can add and update rules by selecting the manage rule tab for your route filter



- You must place the route filter in a resource group

Source: https://docs.microsoft.com/en-us/azure/expressroute/how-to-routefilter-portal

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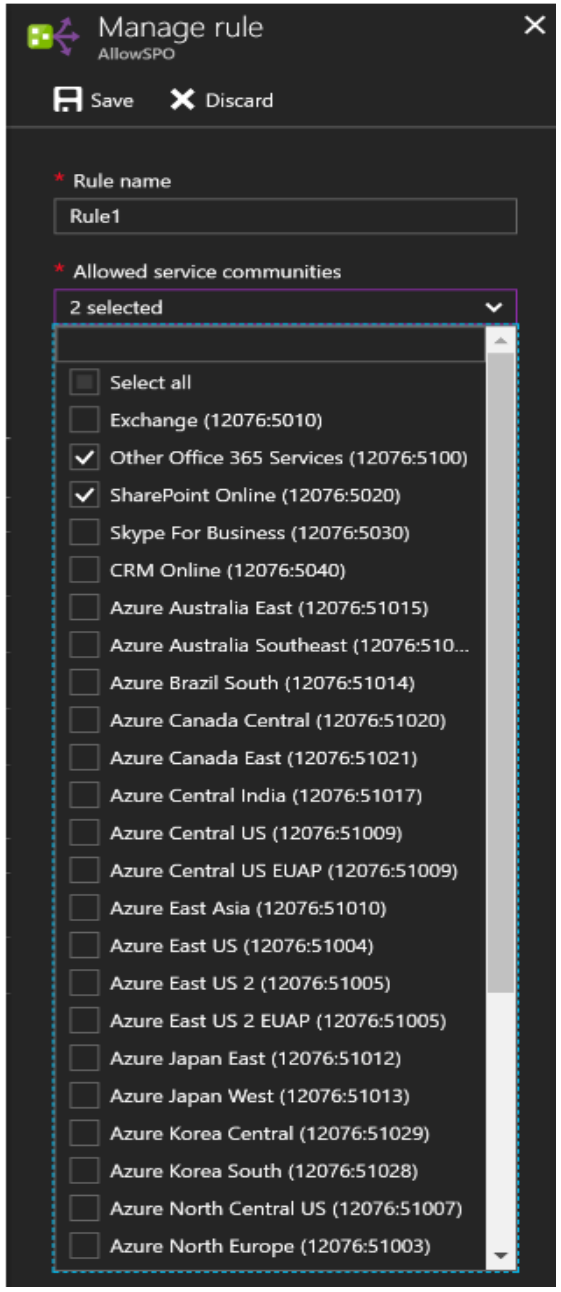
Configuring Route Filters for Microsoft Peering

- You can select the services you want to connect to from the drop down list and save the rule when done



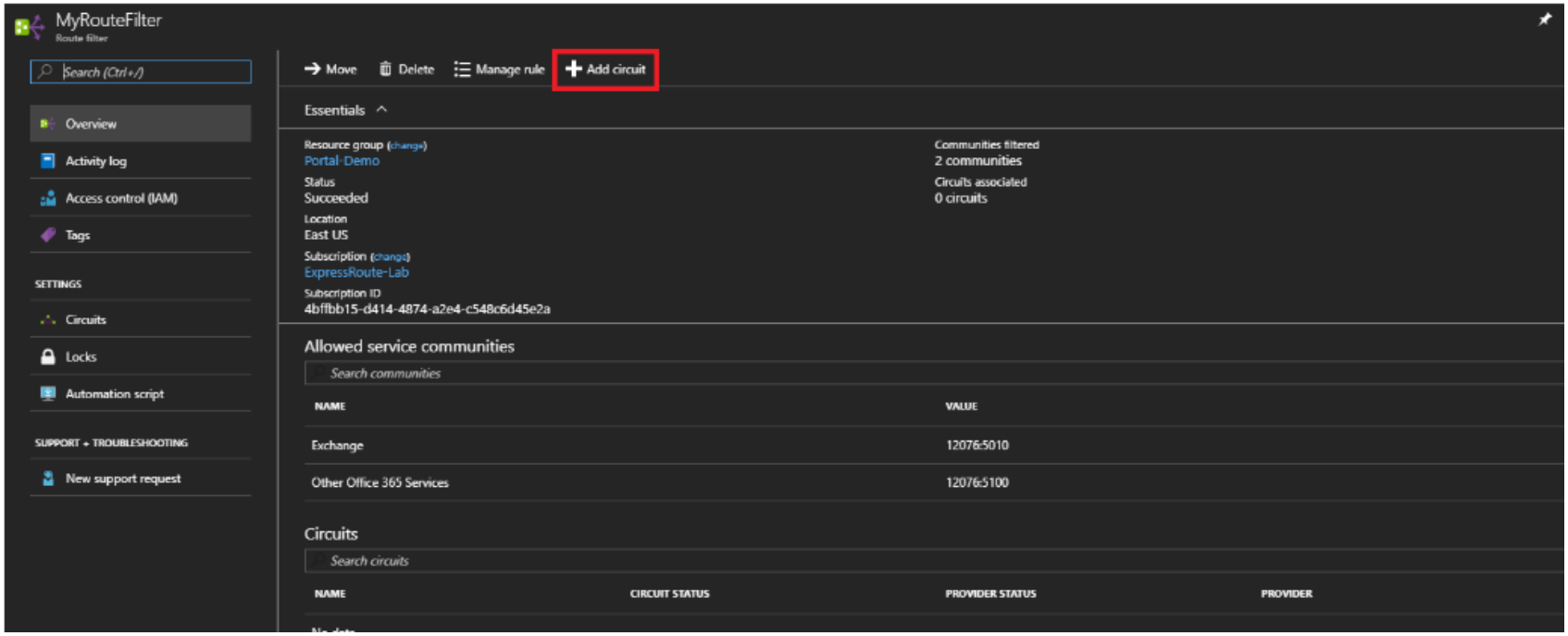
Note: ExpressRoute Premium is an add-on over the ExpressRoute Unlimited Data Plan/Metered Data Plan charges. The ExpressRoute Premium add-on provides the following capabilities:
- Increased route limits for public and private peering from 4,000 routes to 10,000 routes.
- Increased number of VNet links per ExpressRoute circuit from 10 to a larger limit (depending on the bandwidth of the circuit).

https://azure.microsoft.com/en-us/pricing/details/expressroute/

Source: https://docs.microsoft.com/en-us/azure/expressroute/how-to-routefilter-portal

Configuring Route Filters for Microsoft Peering

- You can attach the route filter to a circuit by selecting the “Add Circuit" button and selecting the ExpressRoute circuit from the dropdown list.



Source: https://docs.microsoft.com/en-us/azure/expressroute/how-to-routefilter-portal

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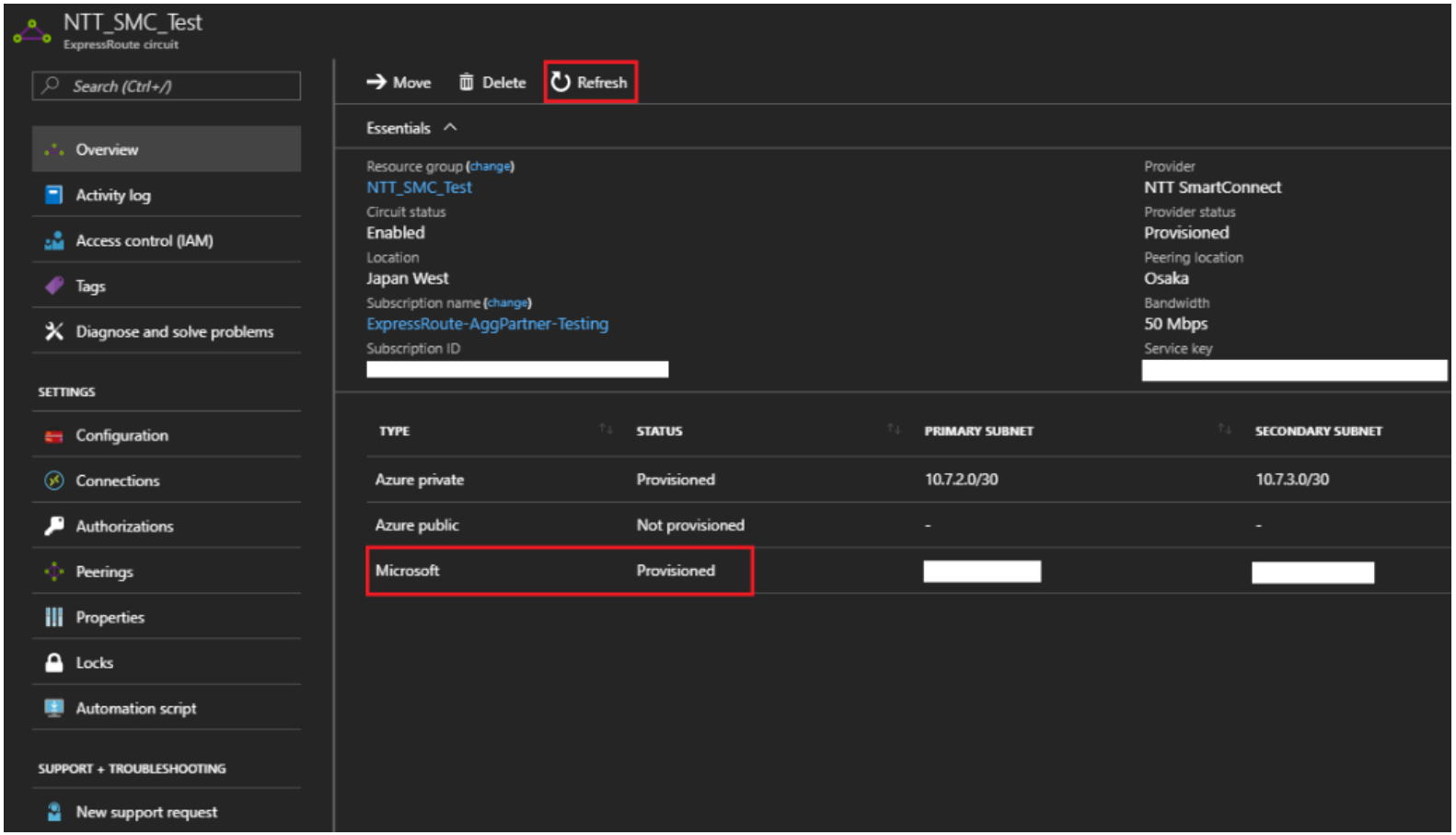
Configuring Route Filters for Microsoft Peering

- If the connectivity provider configures peering for your ExpressRoute circuit refresh the circuit from the ExpressRoute circuit blade before you select the “Add Circuit" button.



Other Common Tasks for Route Filters

- **Viewing Properties** - You can view properties of a route filter when you open the resource in the portal

- **Update the properties of a route filter** - You can update the list of BGP community values attached to a circuit by selecting the "Manage rule" button

- **Detaching a route filter from an ExpressRoute circuit** - To detach a circuit from the route filter, right click on the circuit and click on “Disassociate"

- **Deleting a route filter** - You can delete a route filter by selecting the “Delete” button

Source: https://docs.microsoft.com/en-us/azure/expressroute/how-to-routefilter-portal

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Microsoft ExpressRoute Resources

Introduction	https://azure.microsoft.com/en-us/documentation/articles/expressroute-introduction/
FAQ	https://azure.microsoft.com/en-us/documentation/articles/expressroute-faqs/
Pricing	http://azure.microsoft.com/pricing/details/expressroute/ • Use Exchange Provider Pricing • There is a Premium if you need >4k routes or ability to reach other global regions
Prerequisites	https://azure.microsoft.com/en-us/documentation/articles/expressroute-prerequisites/
Circuits & routing domains	https://azure.microsoft.com/en-us/documentation/articles/expressroute-circuit-peerings/
Partners & peering locations	https://azure.microsoft.com/en-us/documentation/articles/expressroute-locations/
Azure Regions	http://azure.microsoft.com/en-us/regions/
Designing Materials	• https://azure.microsoft.com/en-us/documentation/articles/expressroute-routing/ • https://azure.microsoft.com/en-us/documentation/articles/expressroute-nat/
Configuration Materials	• https://azure.microsoft.com/en-us/documentation/articles/expressroute-howto-circuit-arm/ • https://azure.microsoft.com/en-us/documentation/articles/expressroute-howto-routing-arm/ • https://azure.microsoft.com/en-us/documentation/articles/expressroute-howto-linkvnet-arm/ • https://azure.microsoft.com/en-us/documentation/articles/expressroute-howto-vnet-portal-arm/
Diversity	• Single port includes diversity from IQ+ edge to Microsoft • PE/Path diversity available by ordering 2 IQ ports which would require only a single Express Route Subscription • Full diversity achieved by ordering at 2 separate locations which would require multiple Express Route Subscriptions
Notes	• Azure Datacenter Public IP Blocks: http://www.microsoft.com/en-us/download/details.aspx?id=41653 • Dynamic routing via BGP • Azure Compute supports bring your own private IP

Microsoft O365 Resources

Availability	https://blogs.office.com/2015/09/29/announcing-general-availability-of-expressroute-for-office-365/
Overview	https://support.office.com/en-us/article/Azure-ExpressRoute-for-Office-365-6d2534a2-c19c-4a99-be5e-33a0cee5d3bd?ui=en-US&rs=en-US&ad=US
O365 Traffic Mgt	https://support.office.com/en-us/article/Office-365-network-traffic-management-e1da26c6-2d39-4379-af6f-4da213218408?ui=en-US&rs=en-US&ad=US
Client Connectivity	https://support.office.com/en-us/article/Client-connectivity-4232abcf-4ae5-43aa-bfa1-9a078a99c78b
QOS	https://azure.microsoft.com/en-us/documentation/articles/expressroute-qos/
Office 365 Locations	https://www.microsoft.com/online/legal/v2/?docid=25 • O365 has a primary & DR site for each tenant. • Internet access will be proxied through the closest O365 location and backhauled on MS backbone
Address Blocks	https://support.office.com/en-us/article/Office-365-URLs-and-IP-address-ranges-8548a211-3fe7-47cb-abb1-355ea5aa88a2
CDN Usage	https://support.office.com/en-us/article/Content-delivery-networks-0140f704-6614-49bb-aa6c-89b75dcd7f1f
Network Planning	https://support.office.com/en-us/article/Network-planning-and-performance-tuning-for-Office-365-e5f1228c-da3c-4654-bf16-d163daee8848
Implementing ExpressRoute for Office 365	https://support.office.com/en-us/article/Implementing-ExpressRoute-for-Office-365-77735c9d-8b80-4d2f-890e-a8598547dea6
O365 Step-by-step installation	https://support.office.com/en-us/article/Download-and-install-or-reinstall-Office-365-Office-2016-or-Office-2013-on-your-PC-or-Mac-4414eaaf-0478-48be-9c42-23adc4716658?ui=en-US&rs=en-US&ad=US
Route Filters	https://docs.microsoft.com/en-us/azure/expressroute/how-to-routefilter-portal