Belnet Cloud Connect
MS Azure

January 2019

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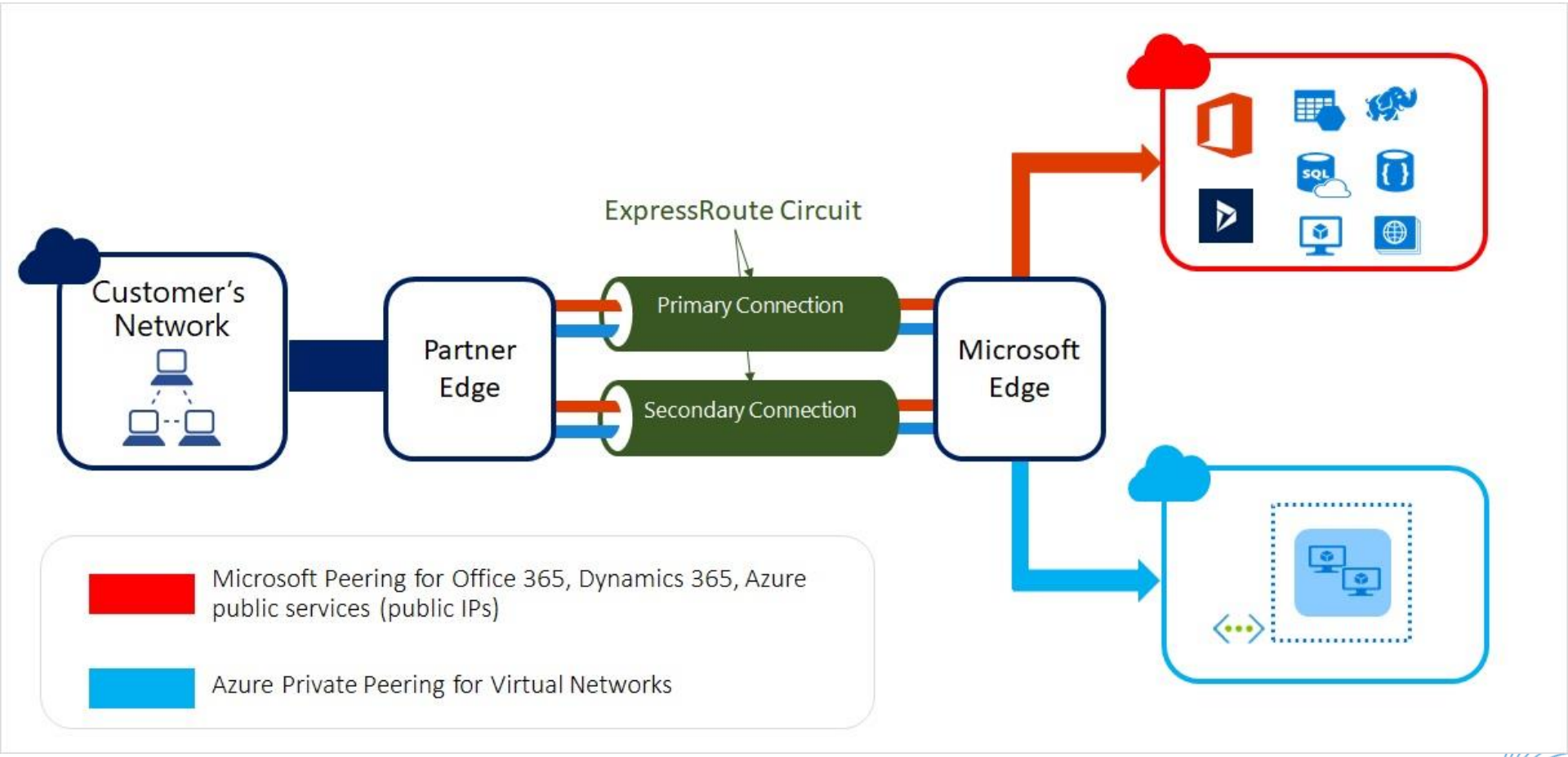
Belnet
dedicated connectivity

.be

Agenda

- What is Express Route ?
- What does GÉANT ?
- Pros and Cons
- When/why use it?
- Technical aspects

What is Express Route



(From Microsoft website)

What is Express Route

- A private connection to the Microsoft cloud services
- A redundant layer 2 VPN tunnel to Microsoft
- A routing protocol (BGP) to garantee connectivity

What does GÉANT

- GÉANT has signed a partnership agreement with Microsoft to act as network connectivity provider
- The agreement connects Microsoft's cloud services directly to Europe's research and education community
- The partnership agreement is part of the GÉANT Project's cloud activity
- https://cloud.geant.org

Pros and Cons

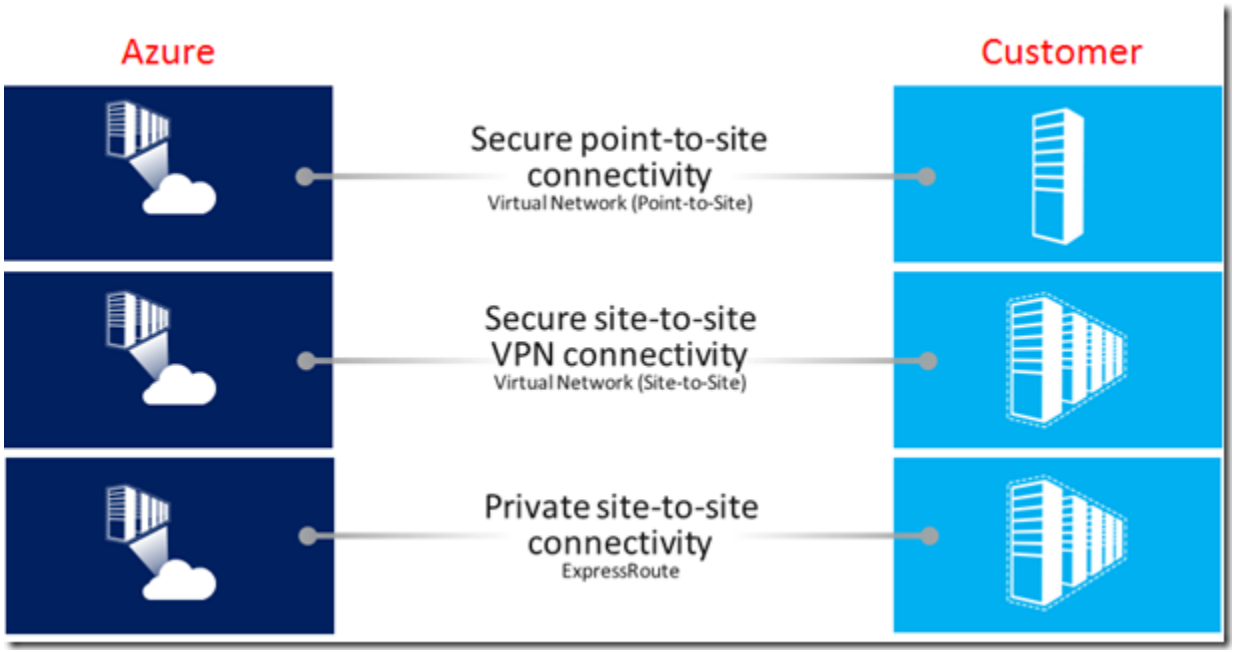
- Dedicated layer 2 connection
- Scalable bandwidth (in theory up to 10Gbps)
- Private IP addressing with BGP for better resilience
- Independent from IP connectivity (commercial Internet connection)

- Azure cloud data unavailable on public internet

When/why use it?

- You need virtualization logically within your own network
- You don’t want the possibility to access the data from public internet
- Examples: MySQL Database, LDAP server, SharePoint, Intranet,…

When/why use it?

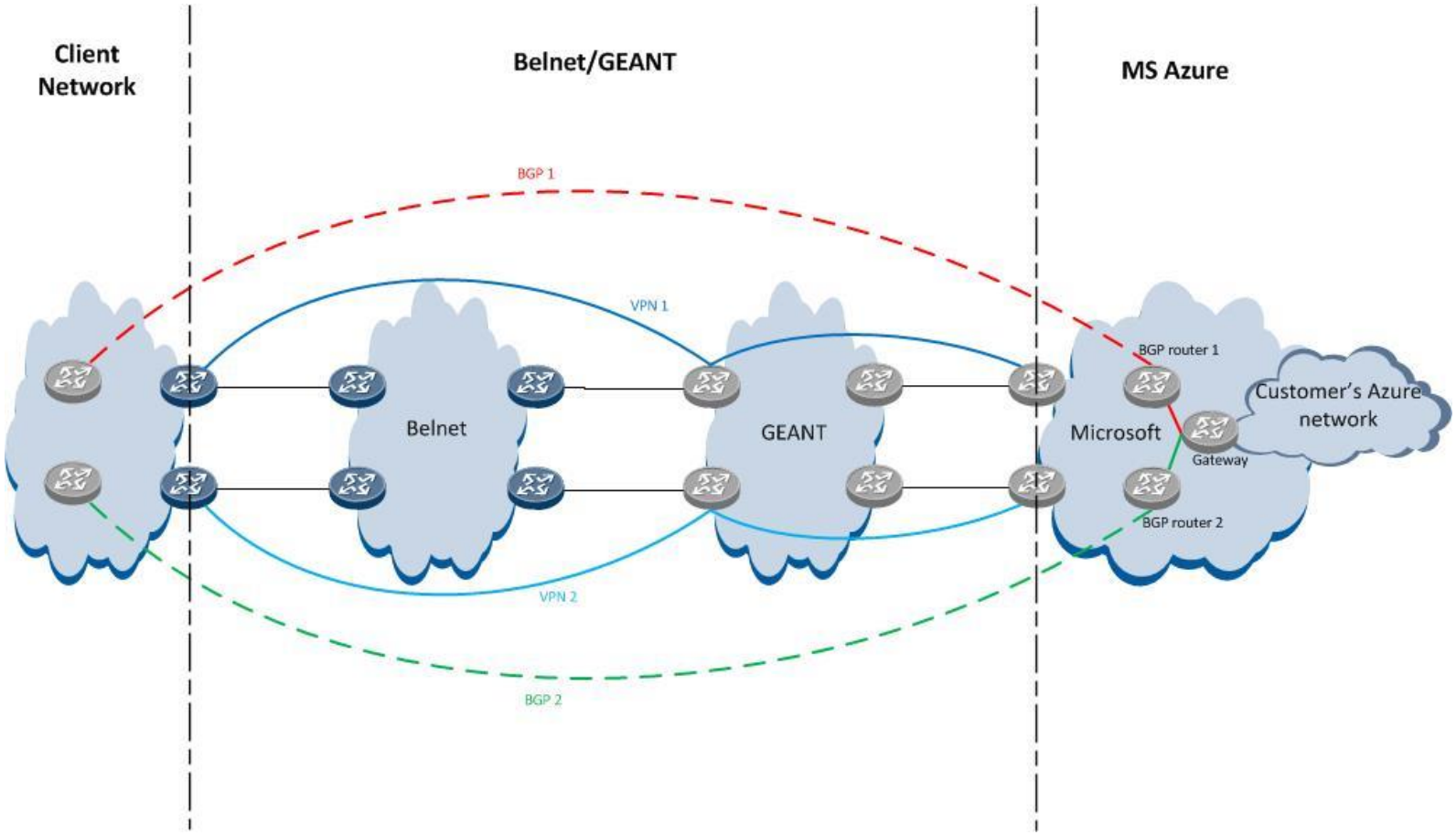


(From Microsoft website)

Cloud Connect MS Azure vs. VPN through Internet

- Belnet and Microsoft are connected on the BNIX, no advantages for Cloud Connect concerning response time
- Geant connection to Belnet in only 1 datacenter (this should change in the future)
- Microsoft connection on BNIX in only 1 datacenter
- VPN uses commercial Internet, Cloud Connect is not taken into account for the Internet available bandwidth

Technical aspects



Important remark

- The user pays Microsoft as soon as he activate his service key.
- We (Belnet) need some time to configure the connection.
- To avoid paying a service without receiving it for too long, it is better to let us know you want Express Route, before activating it by Microsoft.
- We (Geant) needs the service key to activate the service by Microsoft, so once you receive the service key it will take a couple of days for Geant to configure the final touch to the connection.

Commercial info / pricing

- Installation fee: 750 euro (one time fee)

- Annual fee: 1.700 euro for 100Mbps and 1Gbps for a redundant connection to Microsoft

And now, the real technical part…

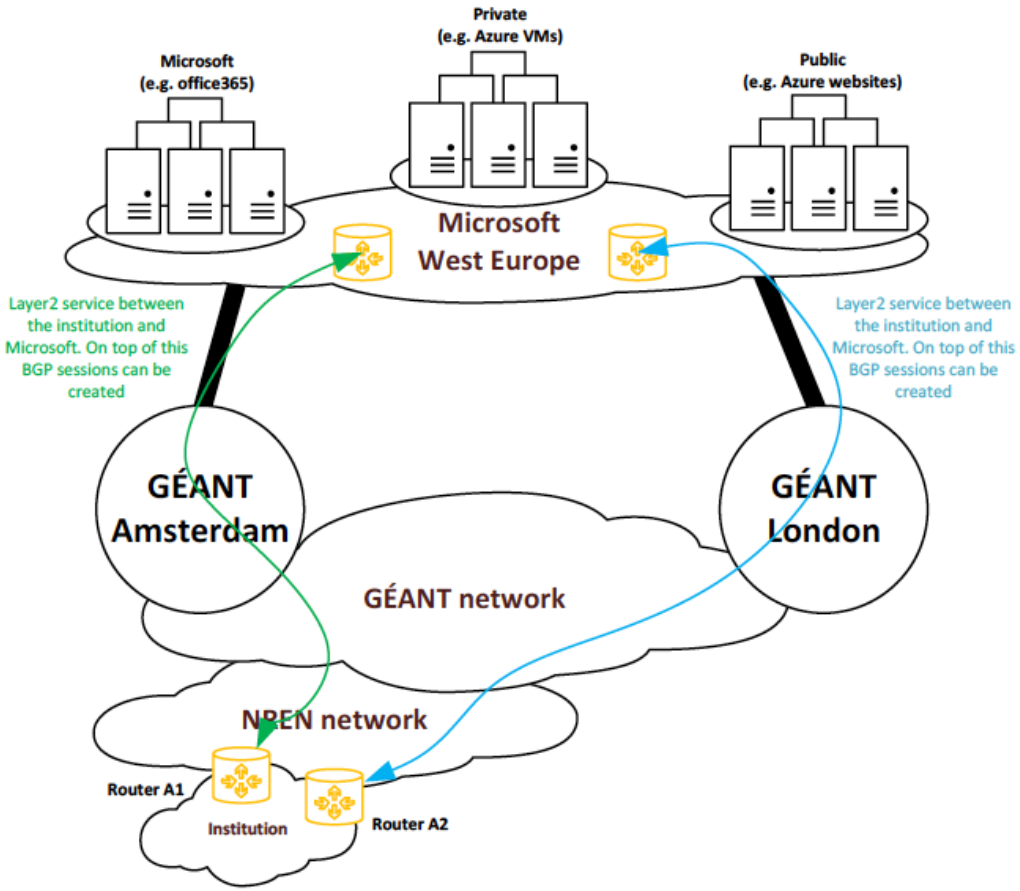
Expressroute How to…

Preconditions

To be able to request and setup an ExpressRoute connection via GÉANT institutions should consider the following conditions and requirements:

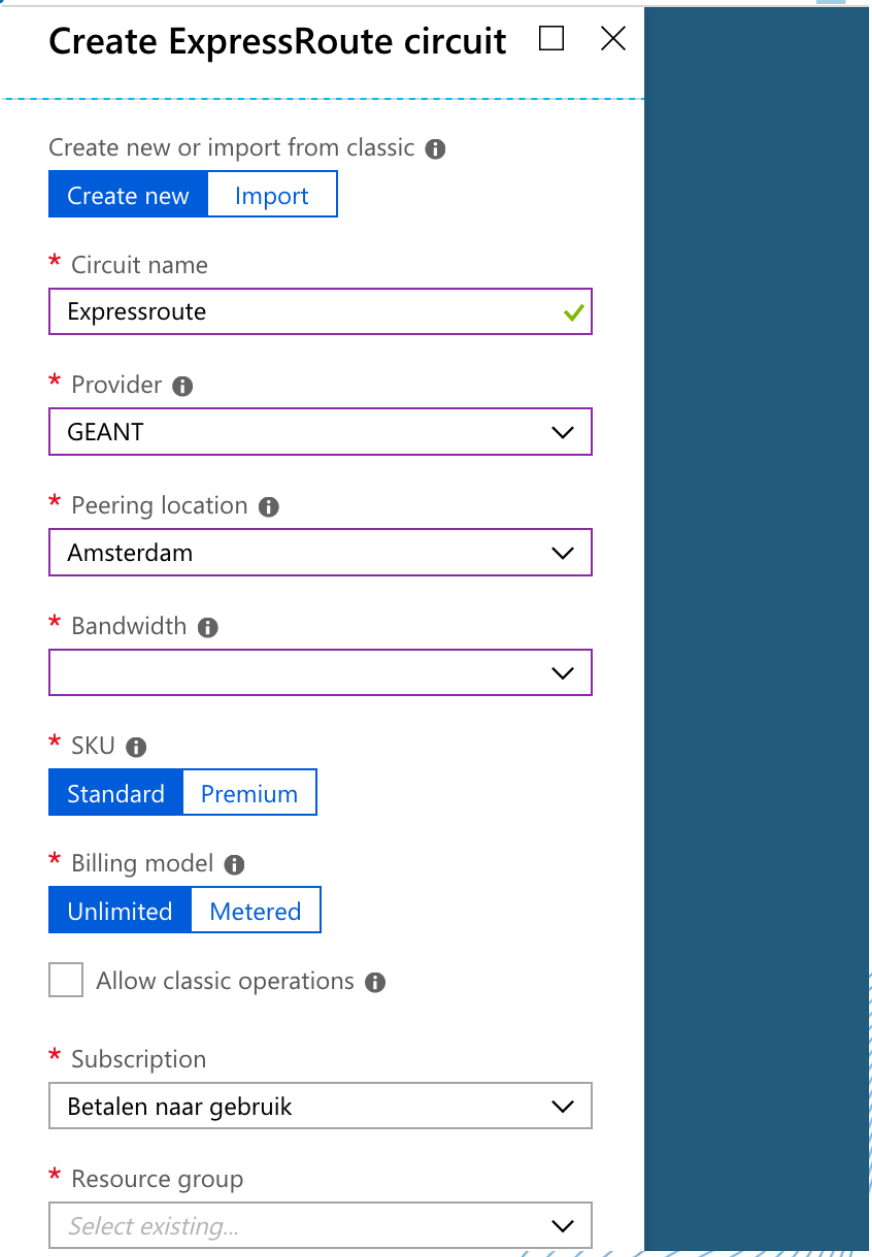
- You must have a valid Microsoft account with an active Azure subscription
- You must have connectivity to an NREN that is connected to GÉANT
- You need a device that is capable of handling double tagged VLANs (IEEE 802.1ad)1
- You must have a router that runs BGP

Expressroute How to…



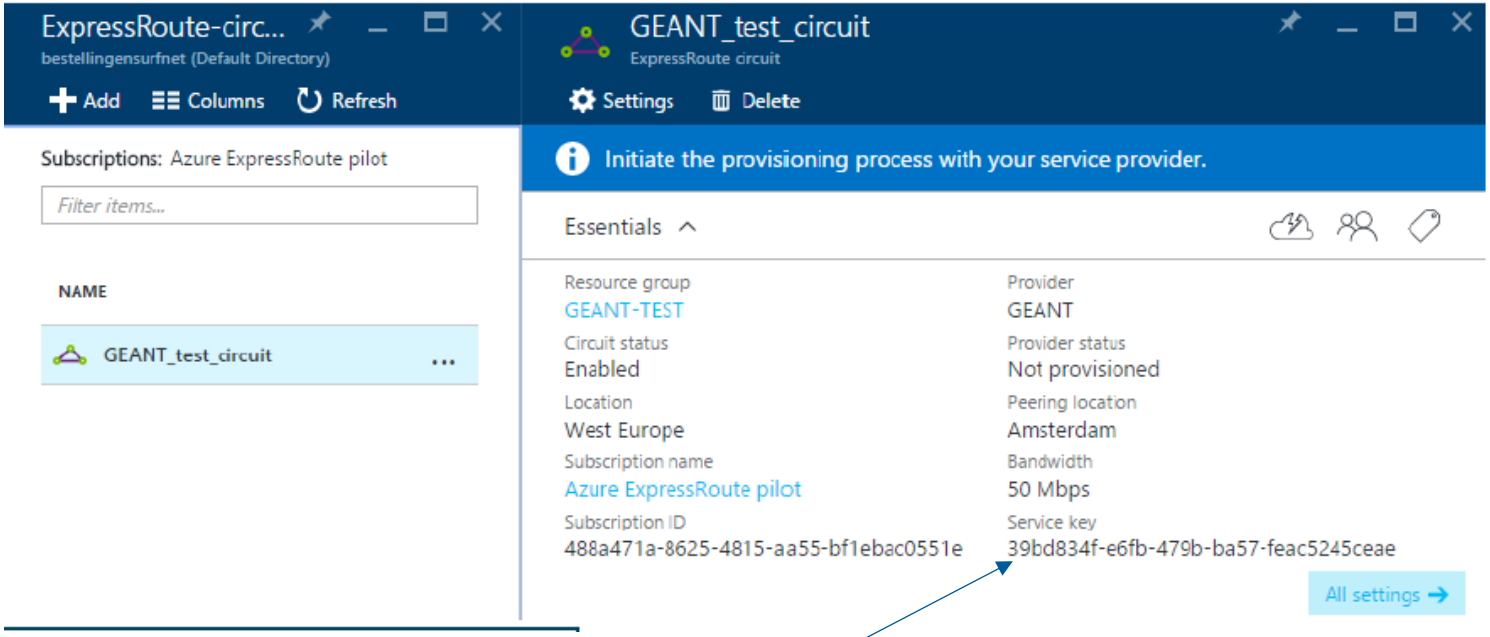
Expressroute How to…

- First step → Request Expressroute via Azure Portal
  - Provider: Géant
  - Determine bandwidth, subscription, billing model (depending needs)



Expressroute How to…

- Expressroute created in state ‘not provisioned’



- Send us the service key

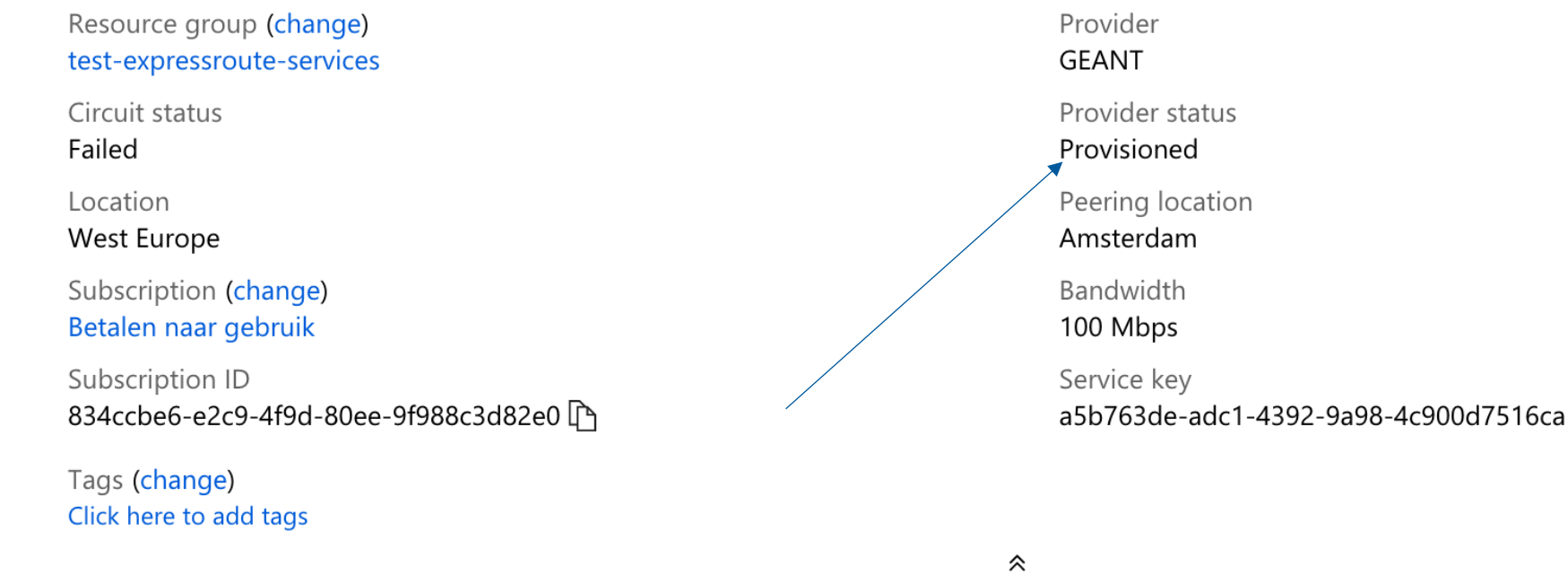
Expressroute How to…

- Belnet asks Géant to provision the Expressroute

- Two VLANs are communicated for redundant setup:
  - Primary VLAN directly to Amsterdam
  - Secondary VLAN via London to Amsterdam

- Belnet sets up a layer2 circuit from customer to the edge with Géant.
  - Customer port(s) becomes a trunk with IP + VLAN determined by Géant
  - Géant picks up the VLAN and transports it to Microsoft.

Expressroute How to…



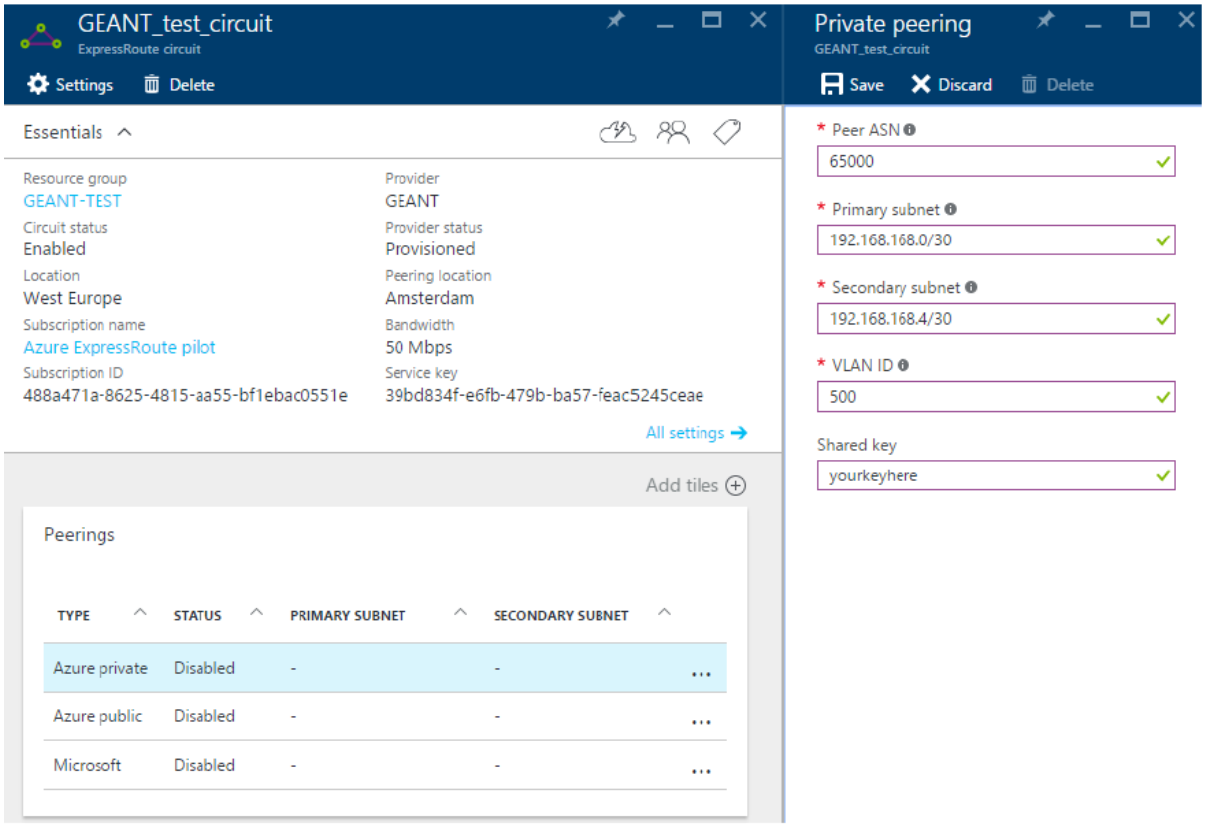
Expressroute in state provisioned

Expressroute How to…

- Here comes the tricky part
  - Setup your BGP session towards Azure
  - Encapsulating you traffic in the correct VLAN to be transported over Belnet and Géant

Expressroute How to…

- Setting up you BGP session
  - Click on your Expressroute and select Private peering



Expressroute How to…

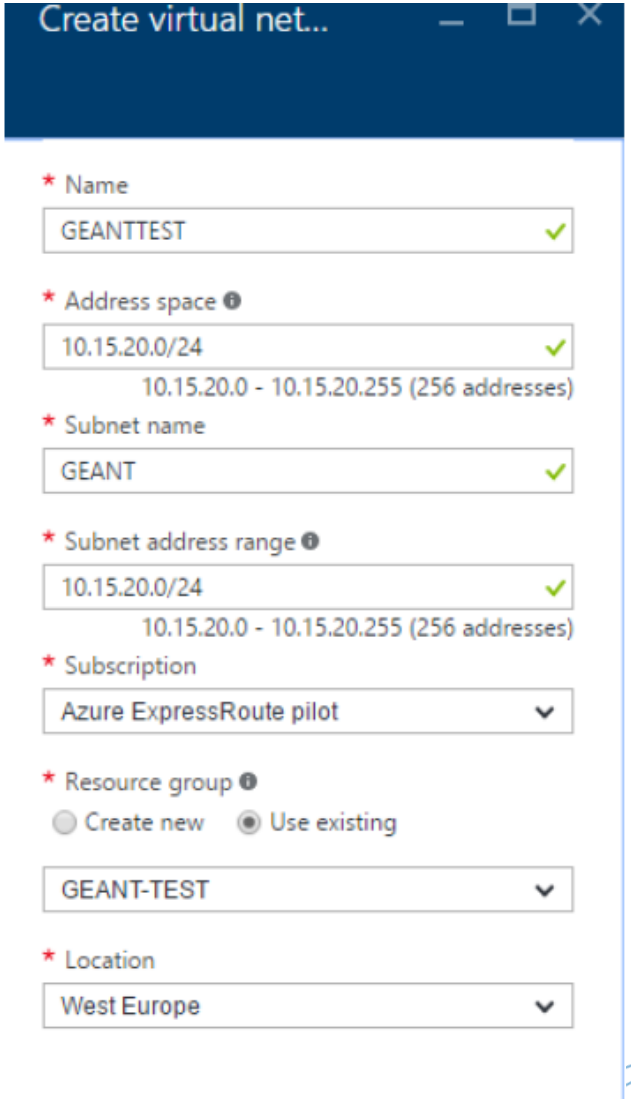
- Encapsulate your BGP session in the correct VLAN
  - Primary BGP session in the VLAN communicated by us that goes to Amsterdam
  - Secondary BGP session goes into the VLAN that is transported via London
- Use of QinQ is necessary
  - Azure demands the BGP session to be setup with a tag…
- Once this is configured, check if you can ping the other side and see if BGP comes up
- Don’t worry, we’re here to help!

Expressroute How to…

- Now you have setup a BGP session
- Next step is determine a Virtual Network and exchange the subnets via BGP
- You need to create a Virtual Network Gateway in Azure to act as Gateway between your network and the Azure Virual Network.

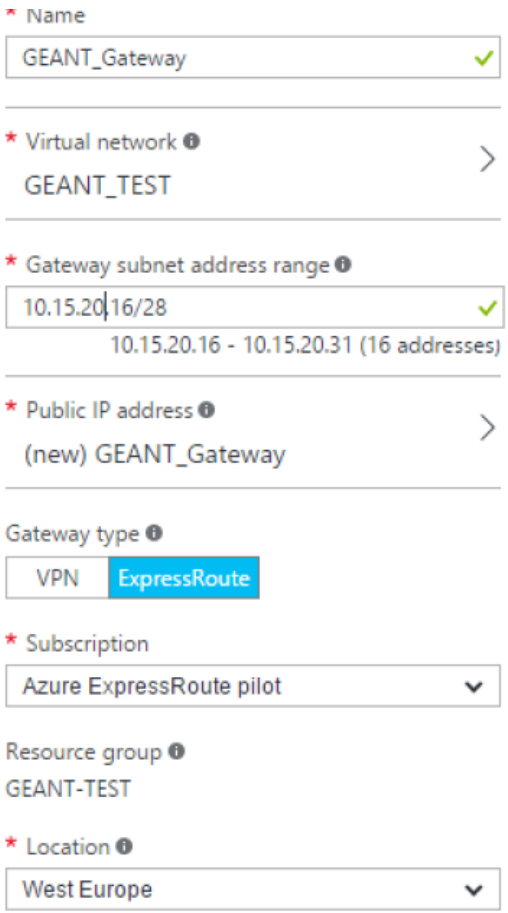
Expressroute How to…

- Create a virtual network
- Click on the search box and type ‘Virtual Network’
- Select and click on create



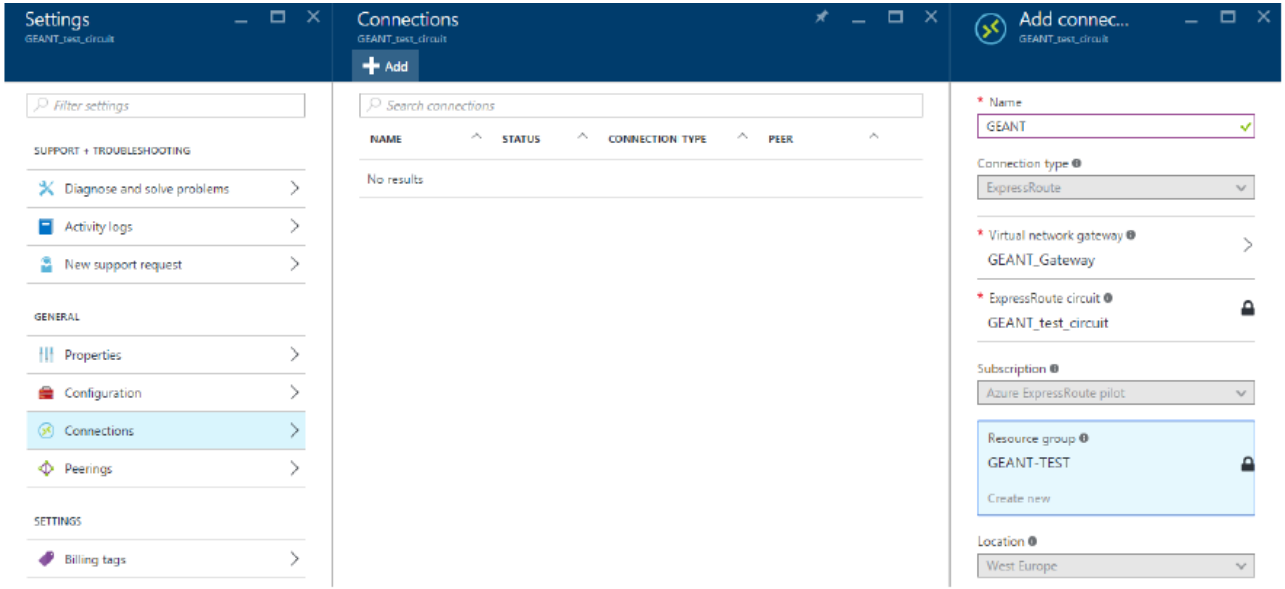
Expressroute How to…

- Create a Virtual Network Gateway
- Click in the search box and type ‘Virtual Network Gateway’, Select and click on create
- Virtual Gateway has to be a subnet taken from the Virtual Network you defined before.
- Takes a long time to create, so be patient…



Expressroute How to…

- Attach the Virtual Network gateway to you Expressroute
- Go to your Expreesroute and click on connections
- Click add and attach your Virtual Network Gateway to your Expressroute.

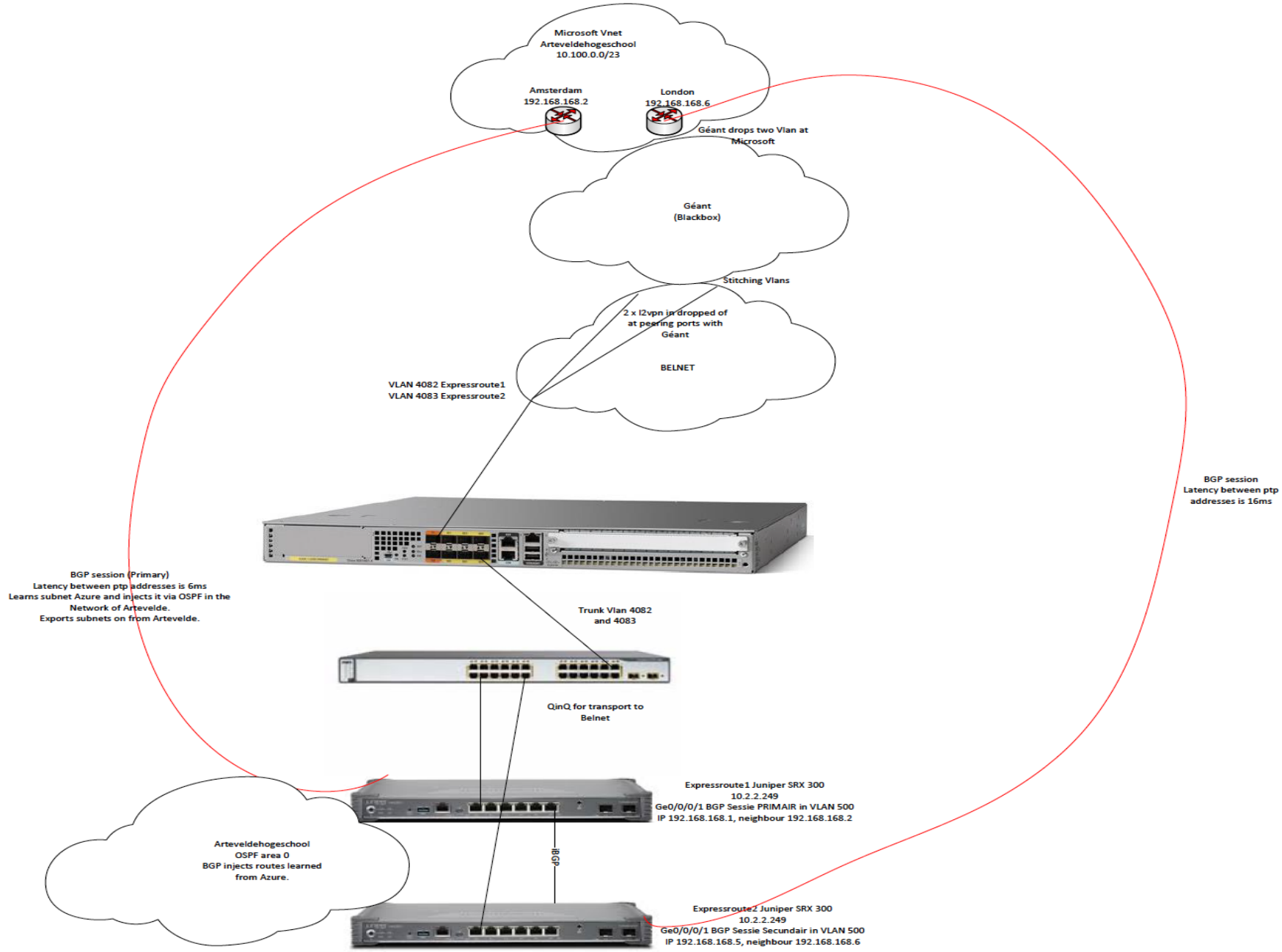


Expressroute How to…

- Check if you are receiving the virtual network via BGP into your network
- You can check routing table in Azure to see if all is well received. You can check the detail of your peering session
- Test failover
- Be aware that the secondary VLAN goes via London, which means double latency
- Create a Virtual Machine in your Virtual network and perform tests.

Expressroute User case Arteveldehogeschool

- First to sign in the POC
- I was working there…
- Two juniper loans from Belnet to test


Microsoft Vnet
Arteveldehogeschool
10.100.0.0/23
Amsterdam
192.168.168.2
London
192.168.168.6
Géant drops two Vlan at Microsoft
Géant
(Blackbox)
Stitching Vlans
2 x l2vpn in dropped of at peering ports with Géant
BELNET
VLAN 4082 Expressroute1
VLAN 4083 Expressroute2
BGP session
Latency between ptp addresses is 16ms
BGP session (Primary)
Latency between ptp addresses is 6ms
Learns subnet Azure and injects it via OSPF in the Network of Artevelde.
Exports subnets on from Artevelde.
Trunk Vlan 4082 and 4083
QinQ for transport to Belnet
Expressroute1 Juniper SRX 300
10.2.2.249
Ge0/0/0/1 BGP Sessie PRIMAIR in VLAN 500
IP 192.168.168.1, neighbour 192.168.168.2
Arteveldehogeschool
OSPF area 0
BGP injects routes learned from Azure.
iBGP
Expressroute2 Juniper SRX 300
10.2.2.249
Ge0/0/0/1 BGP Sessie Secundair in VLAN 500
IP 192.168.168.5, neighbour 192.168.168.6

Thank you
for your attention

Beinet
dedicated connectivity

Belnet
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