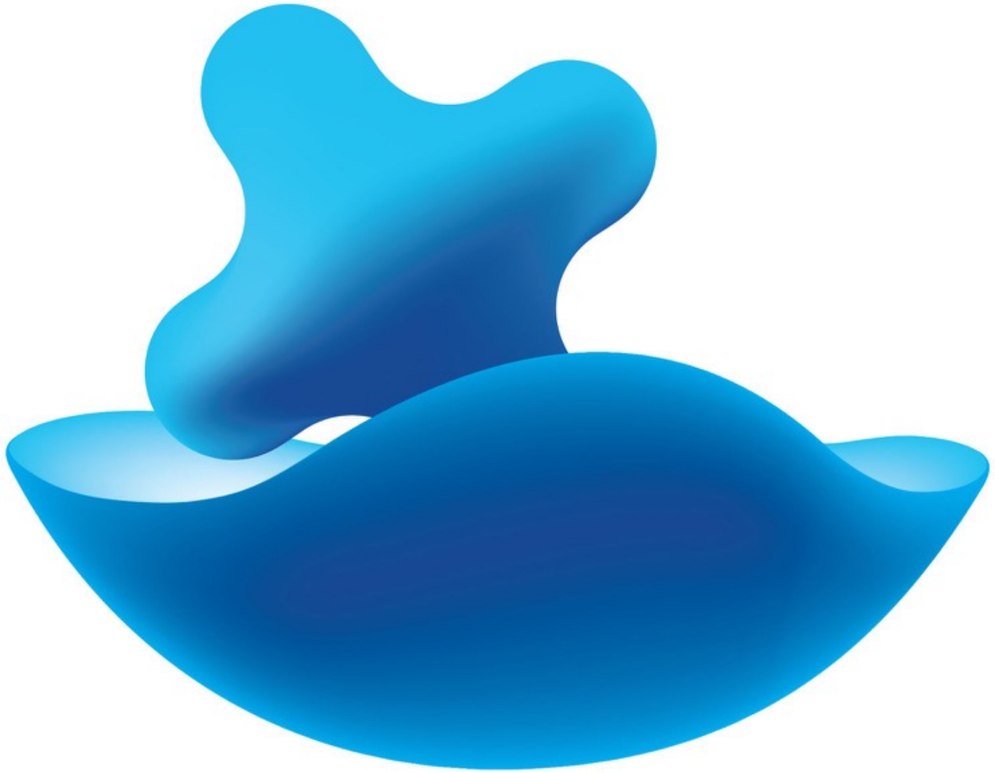


XCLOUD

NETWORKS

About 1.5 years ago I came to question

I am Network Engineer, Me and my Team
are building and maintaining
Telecom and Data Center networks for 15 years

What we do besides that ?
We are always busy - WHY ???

- Please open access between host A and host B on port C
- Increase traffic policer for this Customer
- Configure new Circuit between Amsterdam and Frankfurt
- Provide 5 ports for new server
- Assign 10 new ports to Vlan X

- **AND OF COURSE**

- **My request is urgent**
- **This is blocking project implementation**
- **Customer is complaining because it takes more then 3 hours**
- **I am going to escalate if you don’t provide this change in 5 mins**

Most of the time we are not just building / maintaining networks

We do everything what all kind of different Network Consumers are requesting

And it is not like they always request right things

THIS IS PROBLEM

I WANTED TO SOLVE

I wanted to create a system where

- Customers, Sales people, System engineers - all kind of Network Consumers will be able to define their requirements into intuitive web portal and get things done immediately (as they claim they need)

2-3 months of trying testing failing cycle eventually brought me and couple of my friends to workable concept
we’ve got strong understanding of what are required components

White Box Switch

Cumulus Linux

Piece of Coding

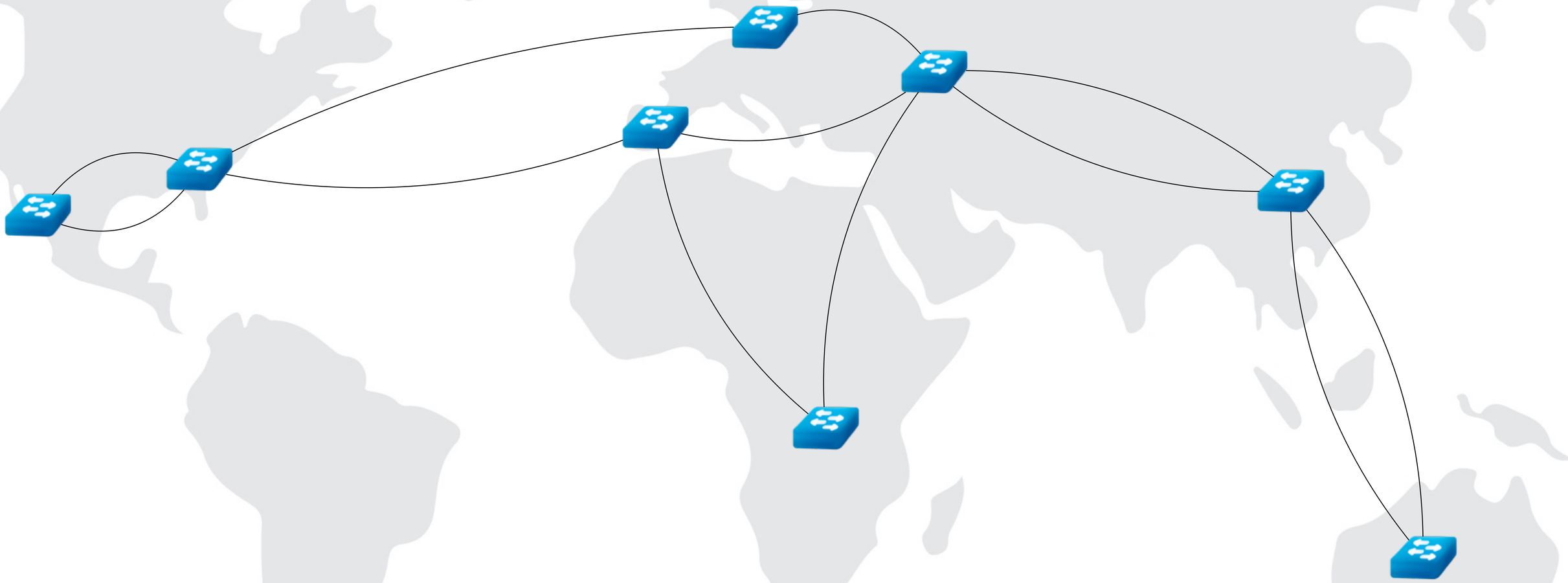
Initial idea was to

build fabric from Bare Metal switches running Cumulus Linux

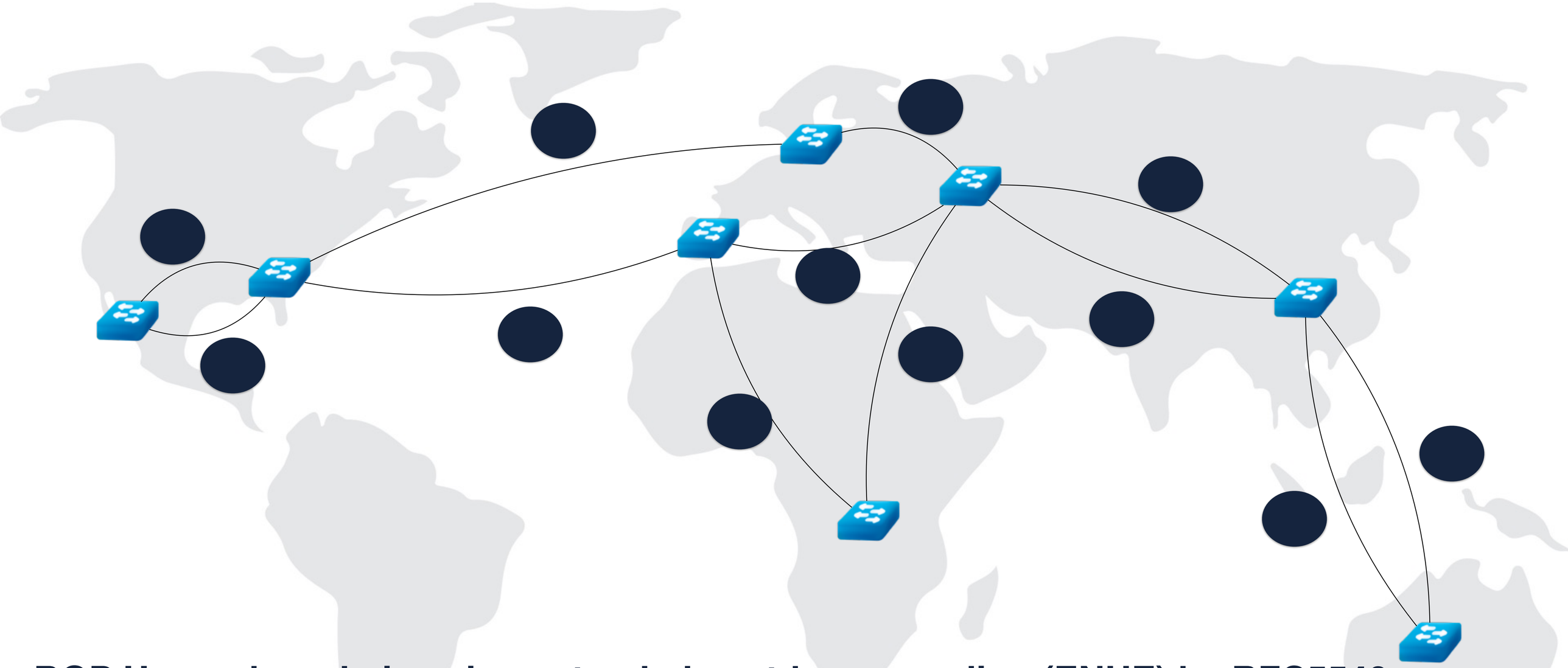
Run BGP between switches

Develop Intuitive web portal

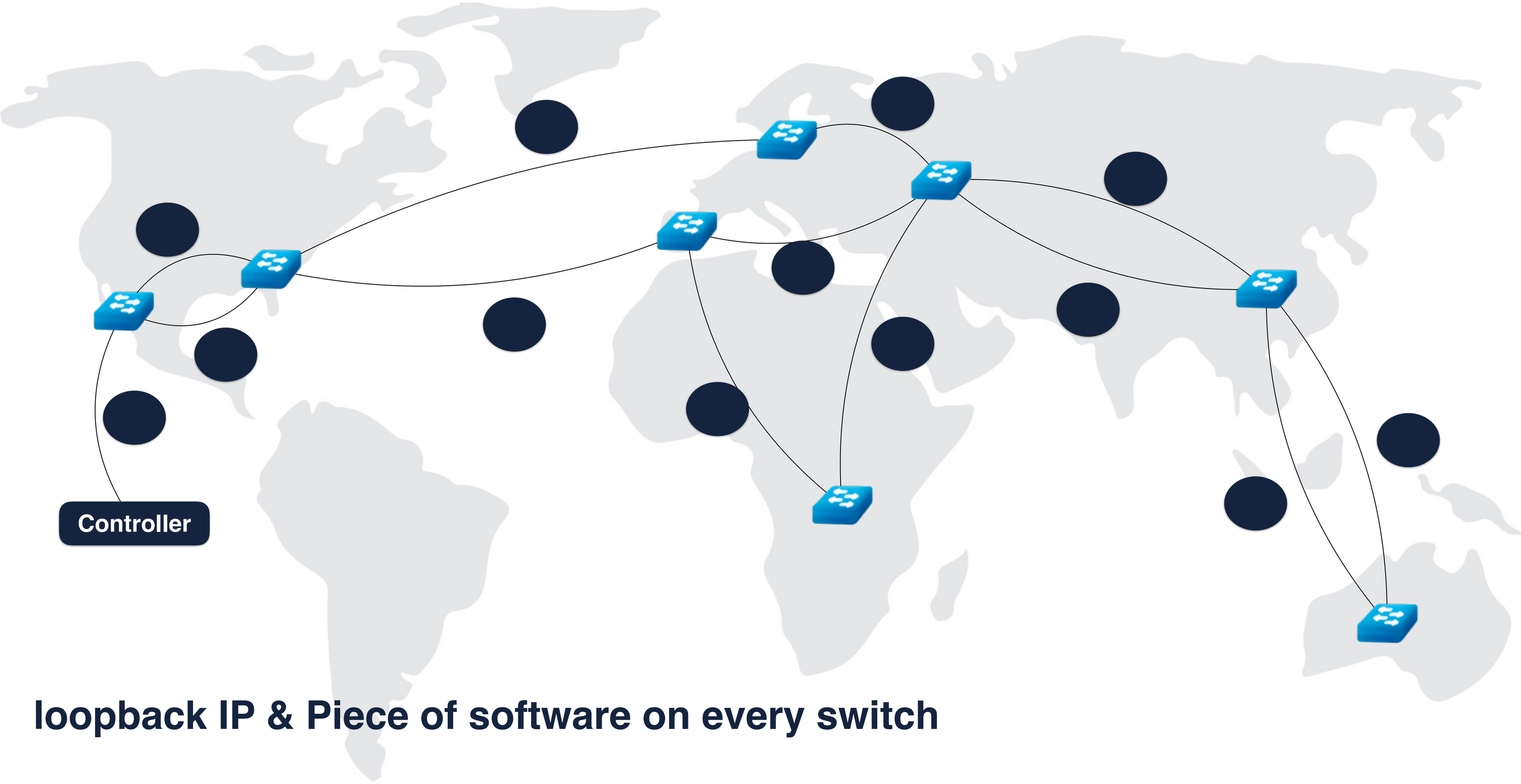
Piece of software on the switch



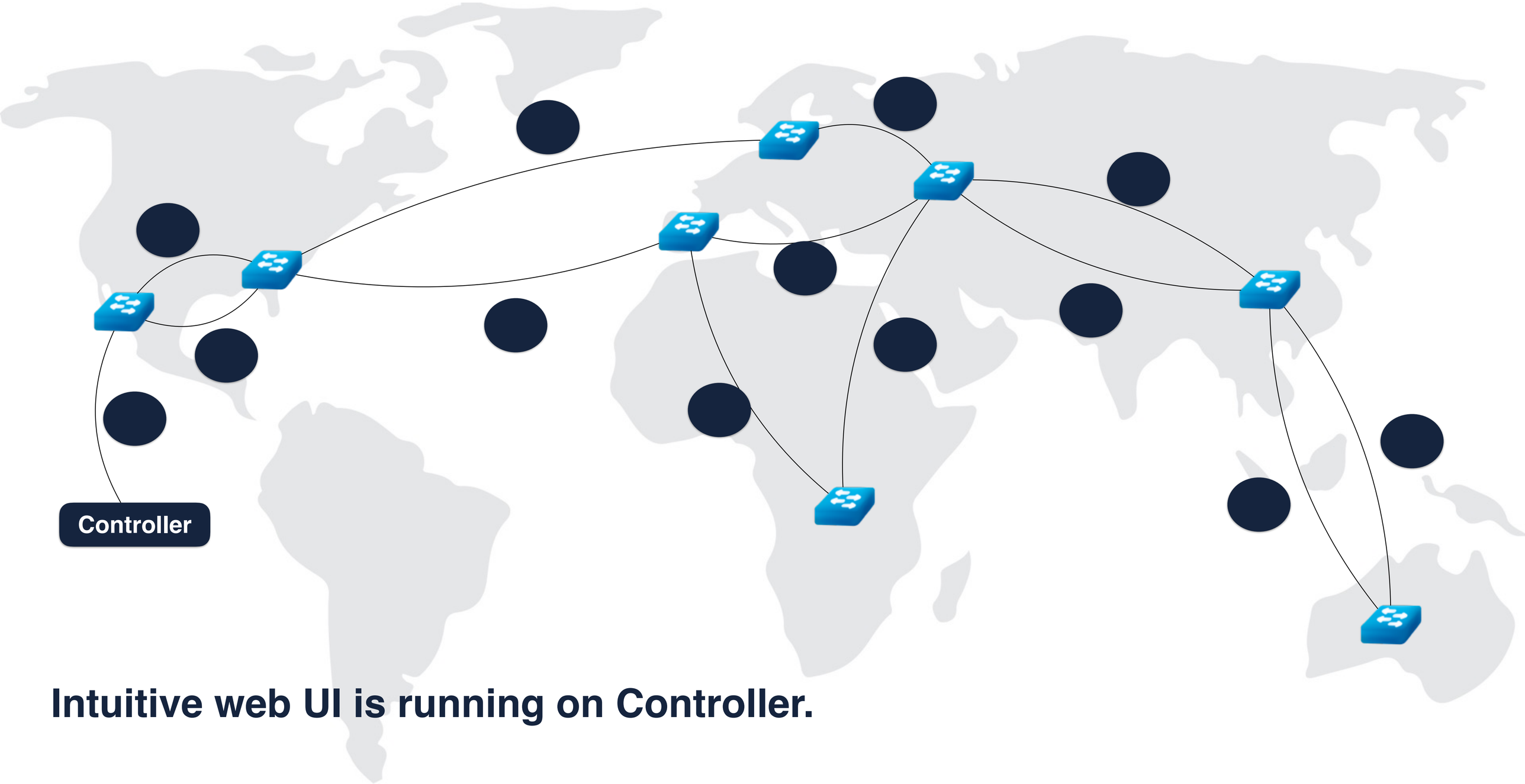
We have focused on use case of Carrier Network



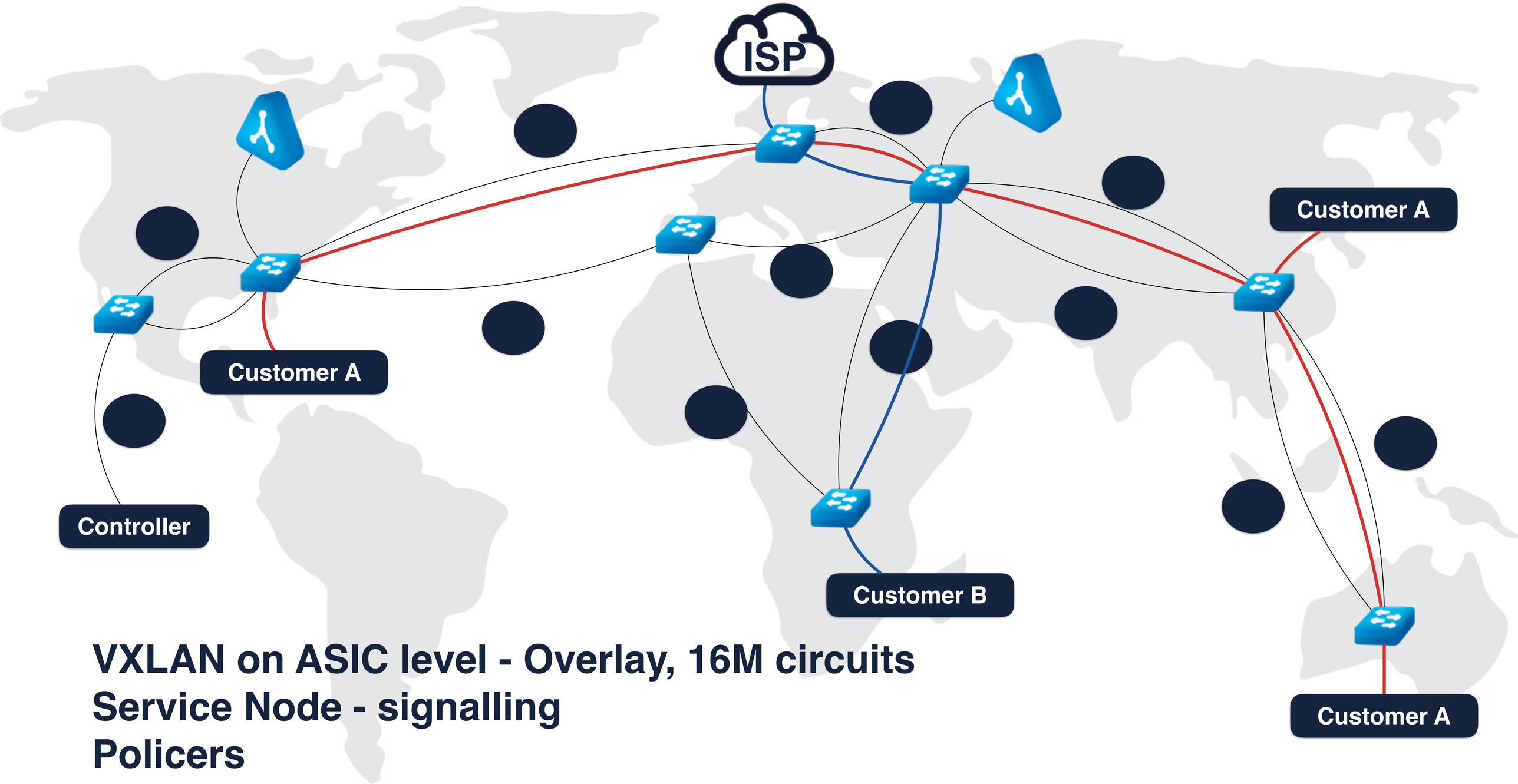
BGP Unnumbered - is using extended next-hop encoding (ENHE) by RFC5549
Thanks to Cumulus Networks' efforts of their Quagga fork ENHE is available on Cumulus Linux running switches and it is also available for Linux servers



loopback IP & Piece of software on every switch



Intuitive web UI is running on Controller.



VXLAN on ASIC level - Overlay, 16M circuits
Service Node - signalling
Policers

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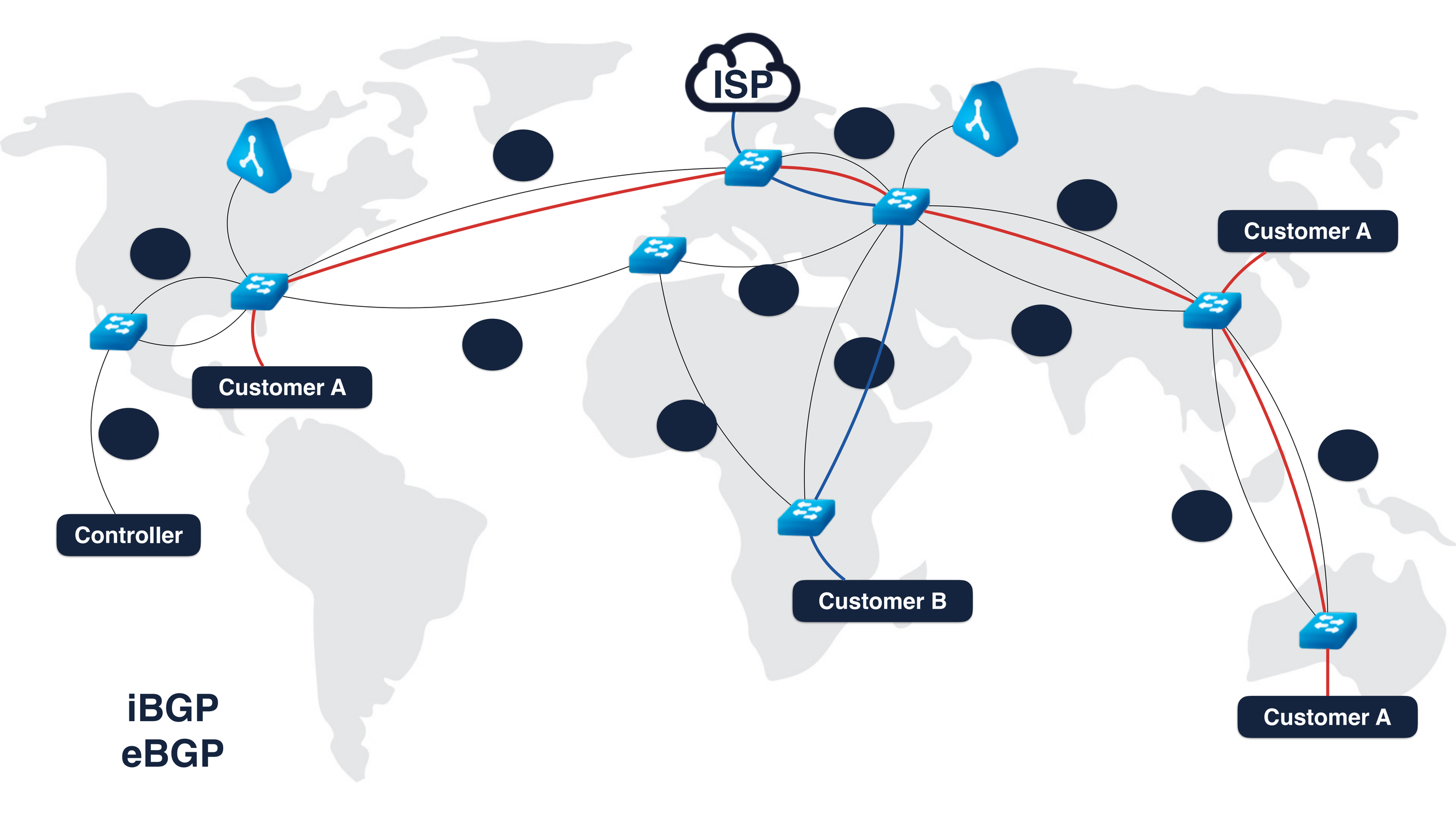
BGP FOR PRICE CALCULATION


ISP
Customer A
Customer A
Controller
Customer B
Customer A
iBGP
eBGP

REGARDS TO INNOVATIVE COMPANY
FOR USING OUR SOLUTION IN PRODUCTION

✓ Automation
✓ Freedom

INSPIRED
WE DECIDED TO GO FURTHER

NEW PROBLEM
NEW CHALLENGE

XCLOUD NETWORKS

What about Data Center deployments ?

During decades network to network relations in data center networks were evolving

But Server to Network is still using legacy technologies still leading to STP, Broadcast, Mlag and other problems

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Remove shared segment between Server and TOR switch

No broadcast, No LAG, No Wasting of IP on subnetting, No Vlan borders, No Stacked TOR switches

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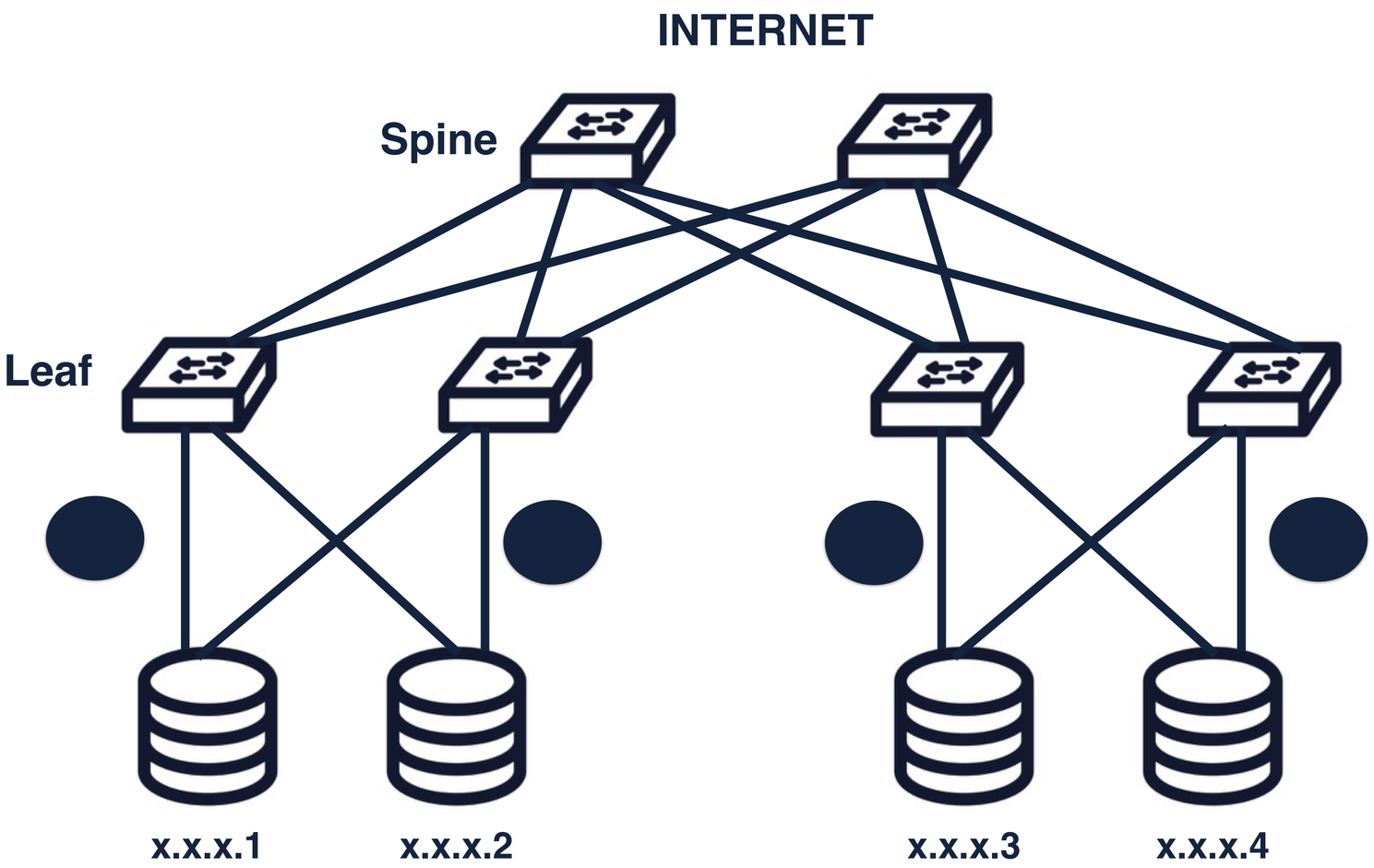
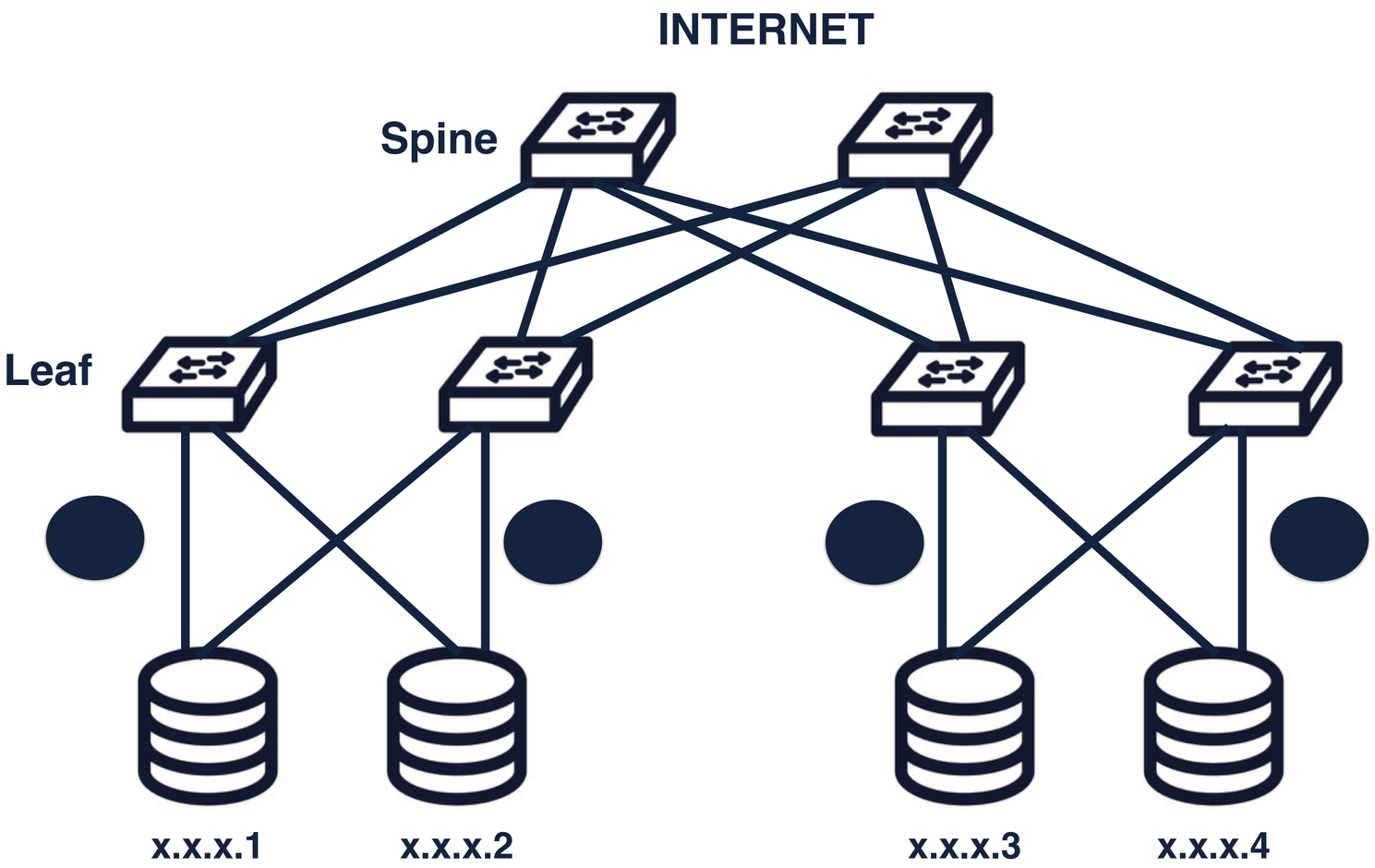
SERVERS TO BECOME PART OF FABRIC

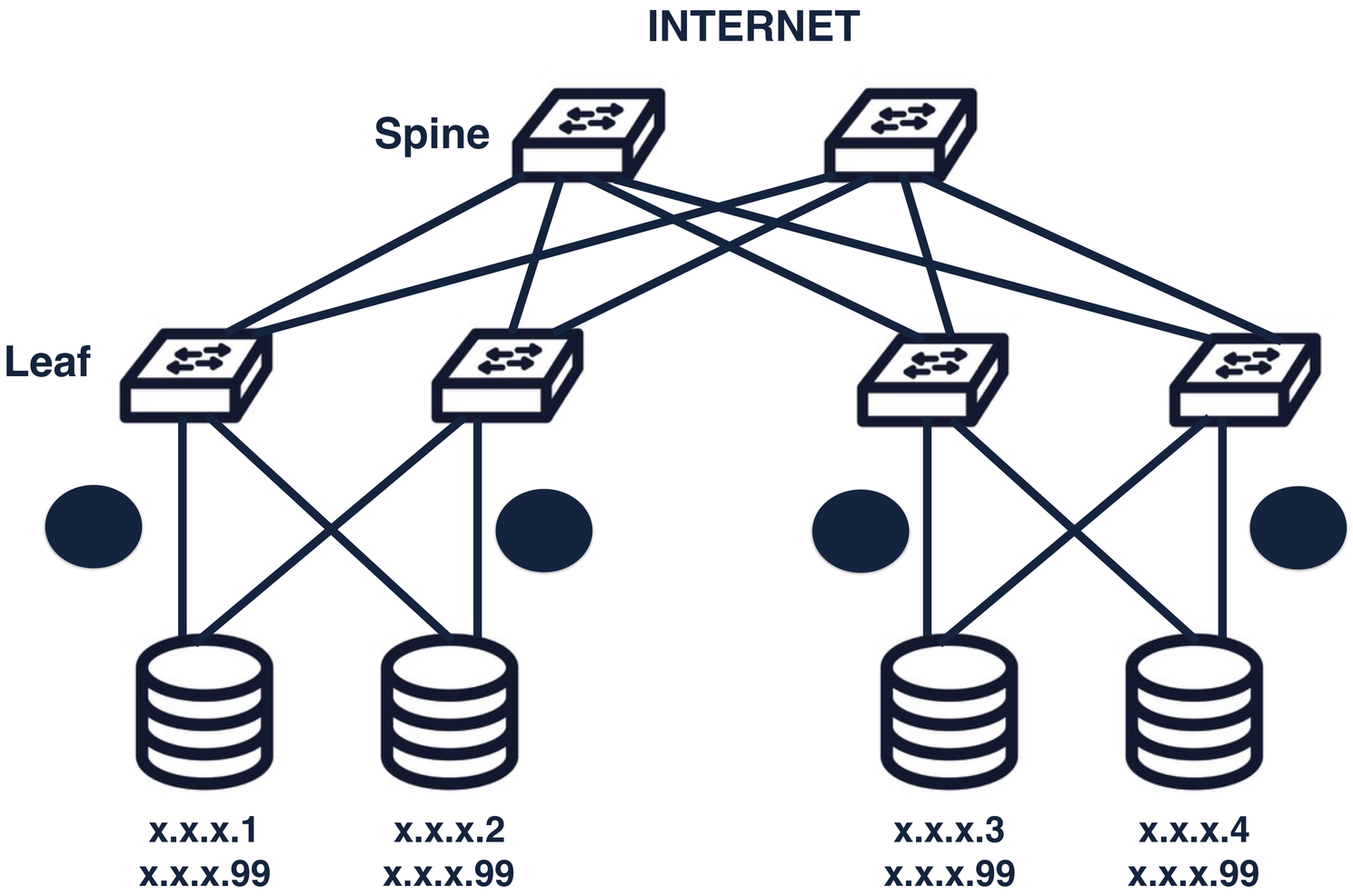


- BGP unnumbered on Server side
- No IP configuration on link Interfaces,
- Loopback /32, /128
- No TOR switch stacking
- BGP attributes for traffic engineering
- preconfigured Quagga package



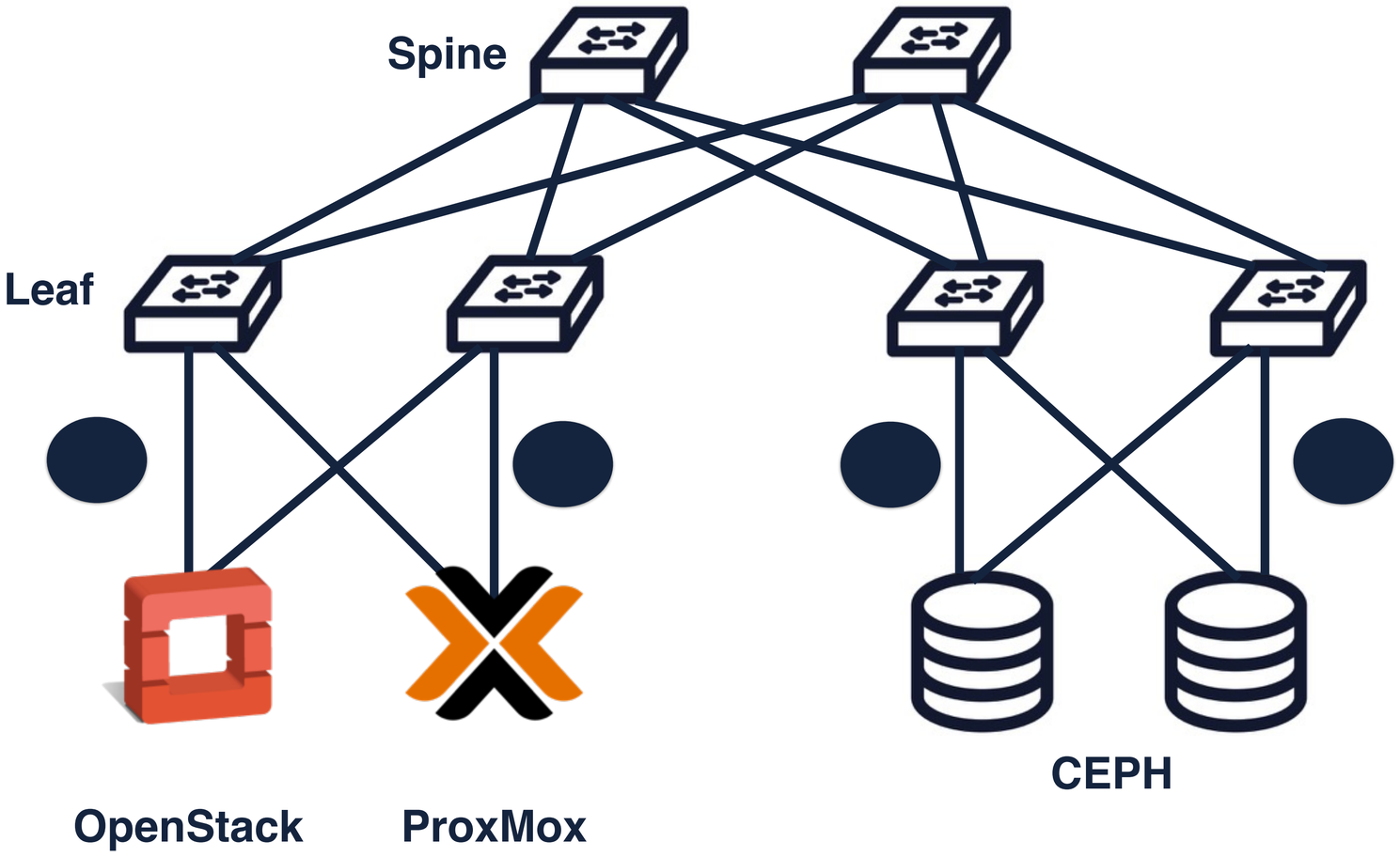
- ACLs
- TCAM size

  Broadcom Trident2+ allows 4K Ingress ACLs
- Server mobility
- Approval procedure

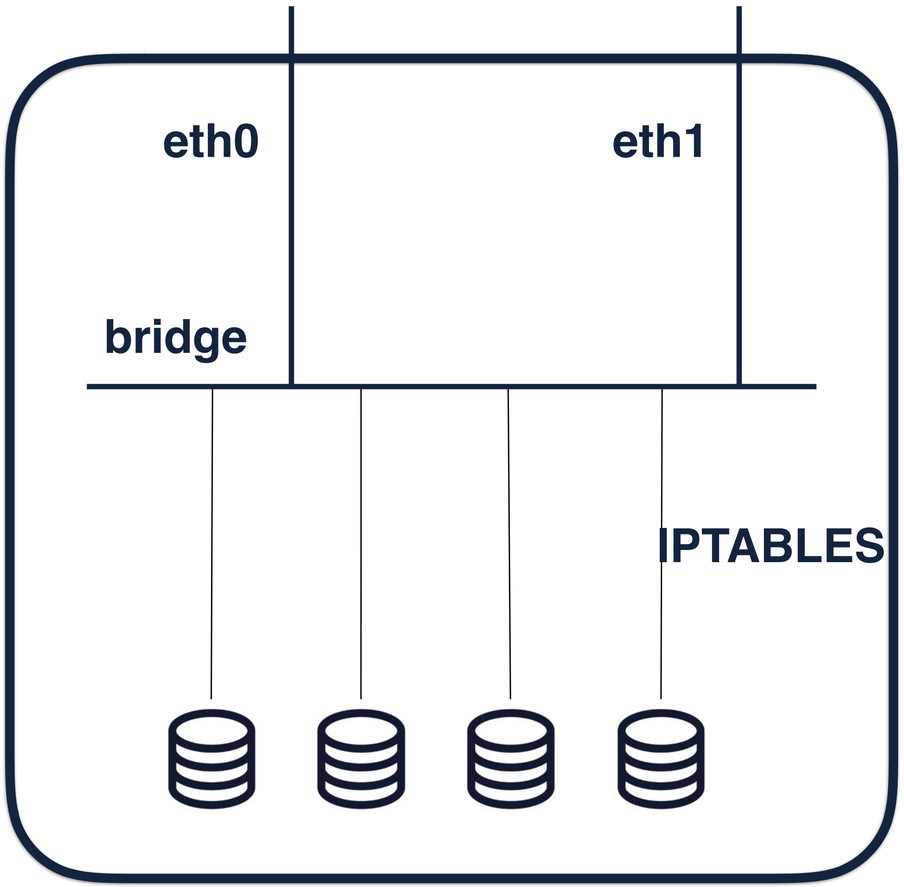


- ANYCAST for load balancing
- 256 ECMP Hashing
- Traffic reroute if server is down
- LB Checks

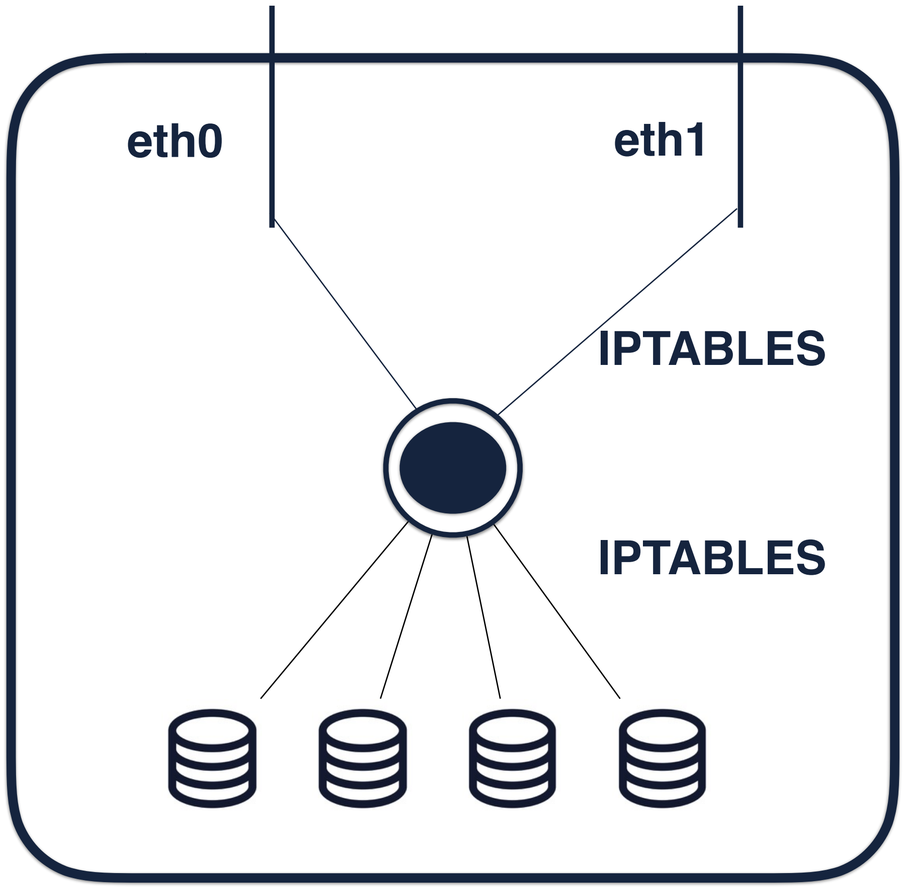
Virtual Machines



- Openstack Controller connects with ROH
- CEPH nodes connects with ROH
- Compute node is running quagga forming eBGP with the fabric



Classic Hypervisor



ROH Hypervisor

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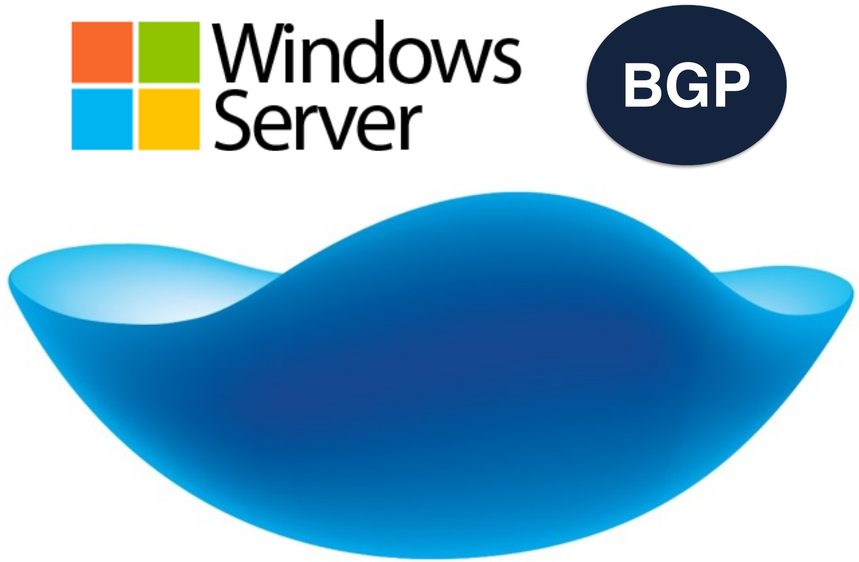
What About Microsoft Operating System ?

Microsoft - running BGP on the host

Kidding ?

Windows Server 2012R2
Supports BGP



Of course not without problems

No support for BGP unnumbered

Refuse to work when advertising ipv4 over ipv6 BGP adjacency (though MS claims it should)

But we found a trick:
Using ipv4 link local addresses
as /30 interface links
then advertising loopback IP

With ROH no more waste of IP addresses on subnetting Innova was able to remove all previously used NAT and build whole network purely based on public IPs bringing back original concept of the Internet

Thanks to our Customer Innova
They swapped existing Infrastructure from Cisco/Juniper/F5
To our solution - serving 24mln of userbase

Summary

- ✓ Automation
- ✓ ACLs
- ✓ Load Balancing
- ✓ HW disaggregation
- ✓ Better agility

Special Thanks to

Attilla De Groot
Sean Cavanaugh
Pete Lumbis
Stefaan Eens

& the rest of Cumulus Networks

XCLOUD NETWORKS

THANK YOU

QUESTIONS