One Size does not Fit All
Tungsten Fabric as an Enabler of Intent-Based Security in Diverse Multicloud Architectures

Richard Roberts & Ato Sánchez-Monge
Juniper Networks
Enterprise
Networking Vendors in the Public Cloud Era

• Is Adding Value on top of a Public Cloud Offering...
  ... challenging?
  ... possible?
One Classical Security Challenge
Classical Solution to the Challenge

Security Groups:

- dev_us_web → dev_us_app
- dev_us_app → dev_us_db
- test_india_web → test_india_app
- test_india_app → test_india_db
- prod_us_web → prod_us_app
- prod_us_app → prod_us_db
- prod_india_web → prod_india_app
- prod_india_app → prod_india_db
Innovative Solution to the Challenge

Firewall Policies:

[web \rightarrow app] && match deployment, site
[app \rightarrow db] && match deployment, site

Multi-Dimensional Security by Prasad Miriyala
Multi-Dimensional Security – Visualization
Where to Place the Added Value?

• At the workloads?
• At the region border?
• At a hub region?
Multi-Cloud with Tungsten Fabric
Service Provider
The EDGE CLOUD Drivers

5G Challenges:
- Ultra Low Latency comms
- High Throughput (*10)

Public clouds leverage their software agility

Telcos leverage their real estate

5G Massive scale Ultra low latency

Sweet Spot < 20 msec

INCREASING LATENCY

- jitter/latency

+ jitter/latency
Challenges of the TELCO Edge Cloud

- Massive Scale and number of sites - $O(1000)$ sites!
- How to balance the distribution of the anchor points?
- Mobility (handover)
The integrated TELCO Edge Cloud Solution

- Vertical Integration complexity explodes with Massive Distribution
- Requires integrated Universal Edge Cloud with CI/CD

Solution: Universal Edge Cloud

- Infrastructure: Control + Fabric (Virtual, Physical, Cloud)
- Use cases
- Digital Services
- APIs

- CO/Aggr/MSO
- Regional DC/POP
- Core Backbone / WAN
- Centralized Data Center

- On-prem
- Tower/Access
- Hub/Pre-agg
- Pre-Aggregation
- Aggregation
- SDN Overlay
- Management, Orchestration, Analytics
- Use cases
- VNPL
- CMS
- vEMS
- SDN Control
- Physical Network Functions
- IP Fabric
- WAN Fabric / Multi-Cloud

- Vertical Integration complexity explodes with Massive Distribution
- Requires integrated Universal Edge Cloud with CI/CD
How to distribute the TELCO Edge Cloud?

Tungsten Fabric efficiently reconciles Clusters and Locations with seamless network integration

• Cluster-to-site mapping supported: Data Center Interconnect and Remote Compute

Data Center Interconnect

Remote Compute
Tungsten Fabric Cluster partitioning – Logical View

Unique K8s or OpenStack glued via TF’s SDN

SDN GW

GW_POPA

Dedicated POPA Router function

Control Node_POPA

MP-BGP

xmp

COMPUTE

sub-cluster
SITE 1

SDN GW

GW_POPB

Dedicated POPB Router function

Control Node_POPB

MP-BGP

xmp

COMPUTE

sub-cluster
SITE 2

SDN GW

GW_POPC

Dedicated POPC Router function

Control Node_POPC

MP-BGP

xmp

COMPUTE

sub-cluster
SITE 3

Unique K8s or OpenStack glued via TF’s SDN

Logical View

ONF CONNECT
Cluster partitioning

- Unique OpenStack/K8s Clusters seamlessly glued via TF

- All Control Functions hosted in Primary POP to dedicate expensive POP CPU for business critical workload
Thank You

Follow Up Links:
https://github.com/tungstenfabric/