HPE SDN Fabric

for Flat & Distributed Network

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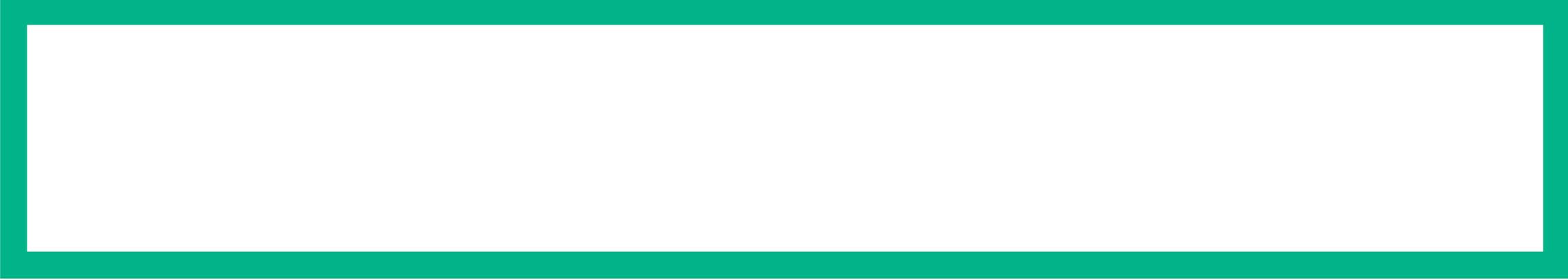
Open Source SDN Controllers

Open Source SDN Controllers

Controller	Code base	Description
OpenDayLight	Java	Multi-propose controller (Most popular)
NOX	Python	Original openflow controller from Stanford
Beacon	Java	Openflow controller licensed from Stanford under GPL
Floodlight	Java	Openflow controller from Bigswitch (based on Beacon)
SNAC	Python & C+	Openflow controller (based on NOX0.4 – targeted at Enterprises)
ONOS	Java	Openflow controller (Carrier scale) from On.Lab
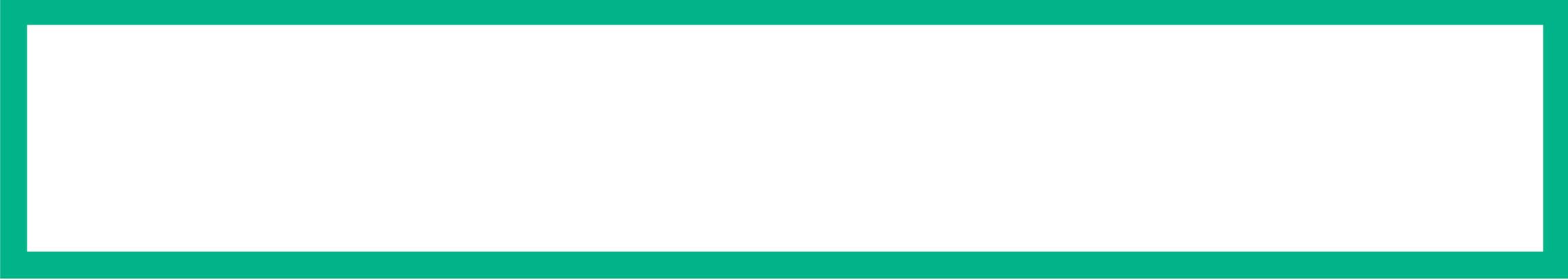
Why Carrier Grade ?

Why Carrier Grade ?

- Beyond a Lab environment

- High Performance (Both Controllers and Switches)

- Fast Failure Detection

- Fast Convergence

$\rightarrow$ **5 nines (99.999 %) availability**

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Enterprise
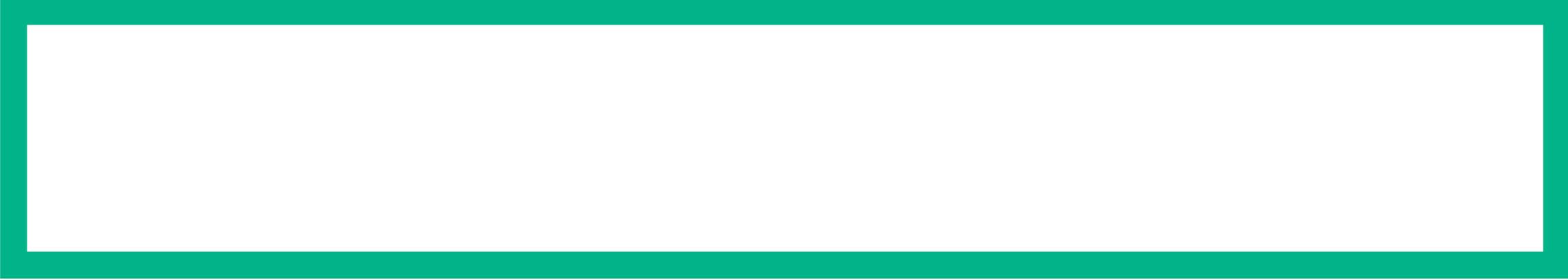
HPE SDN Fabric

HPE ContexNet: OpenDaylight Based Carrier-SDN

Carrier Grade SDN Solution

Carrier Grade throughput. High num of flows programmed individually

Distributed and federated controller – logically centralized, physically distributed controller

Open and Standards based

Built on Open Daylight

Leverages industry standards - Open Flow, LISP, VxLAN

Compatible with HPE and 3rd party orchestration and VIM solutions

NFV Value Adds

Dynamic Service Function Chaining based on policy, VNF load, availability characteristics

Support for VNFs and PNFs

Inherent per customer visibility

Solutions Ready for CSP Use Cases

Virtualized Gi-LAN; EPC Gateway

User and Network interface SIP load balancing

vCPE and Next Gen VPN solutions

Software Defined Networks

Elastic · Agile · Efficient · Reliable

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ContexNet: Open Daylight based Carrier-Grade Distributed SDN Fabric

Key to Carrier Network Virtualization Use-Cases

Confidential
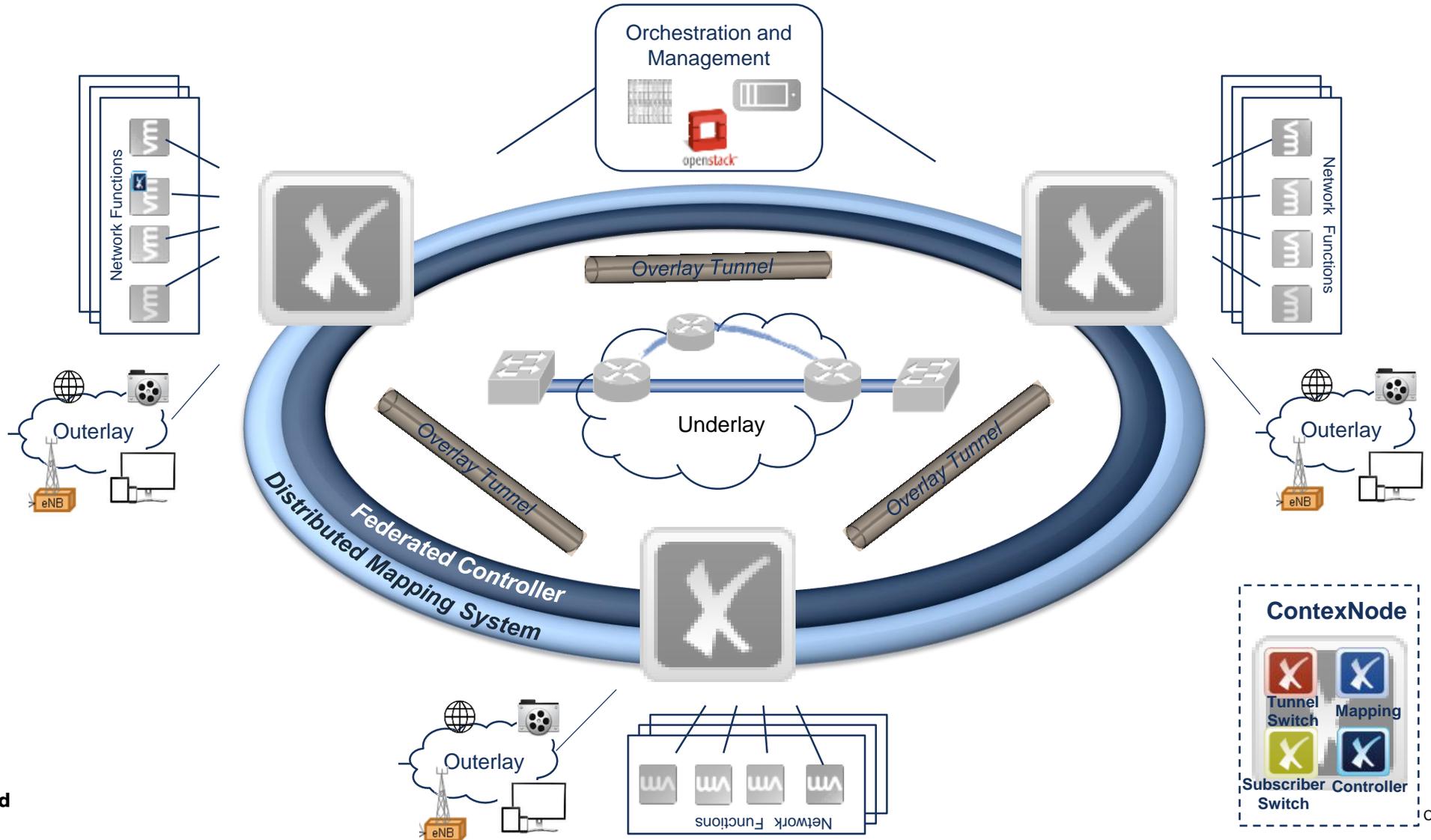
ContexNet: Leveraging OpenDaylight

BROKERS FOR MANAGEMENT & ORCHESTRATION

REST APIs

AAA Broker	PCRF Broker	OSS Broker	Orchestration Broker	Routing Broker	VNF REST API Broker

NETWORK SERVICE FUNCTIONS

- Site to Site Monitor
- VNF Health Monitor
- TAP Manager
- HA Manager
- Node Manager

OPENDAYLIGHT "Lithium"

MAPPING & DATA MODEL

- Mapping Service Connector
- Mapping Service

Flow Handler Plugin (API)

Service Chaining Flow/Hop Handler	L2 Switching Handler	L3 Switching Handler	DHCP Handler	ARP Handler	Load Balancing Handler	L7 VNF Handler

FLOW HANDLERS

OpenFlow Enabled Devices   ContexSwitch   Open vSwitches

LEGEND

ContexNet	OpenDaylight

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Standards, Industry Bodies & Alliances
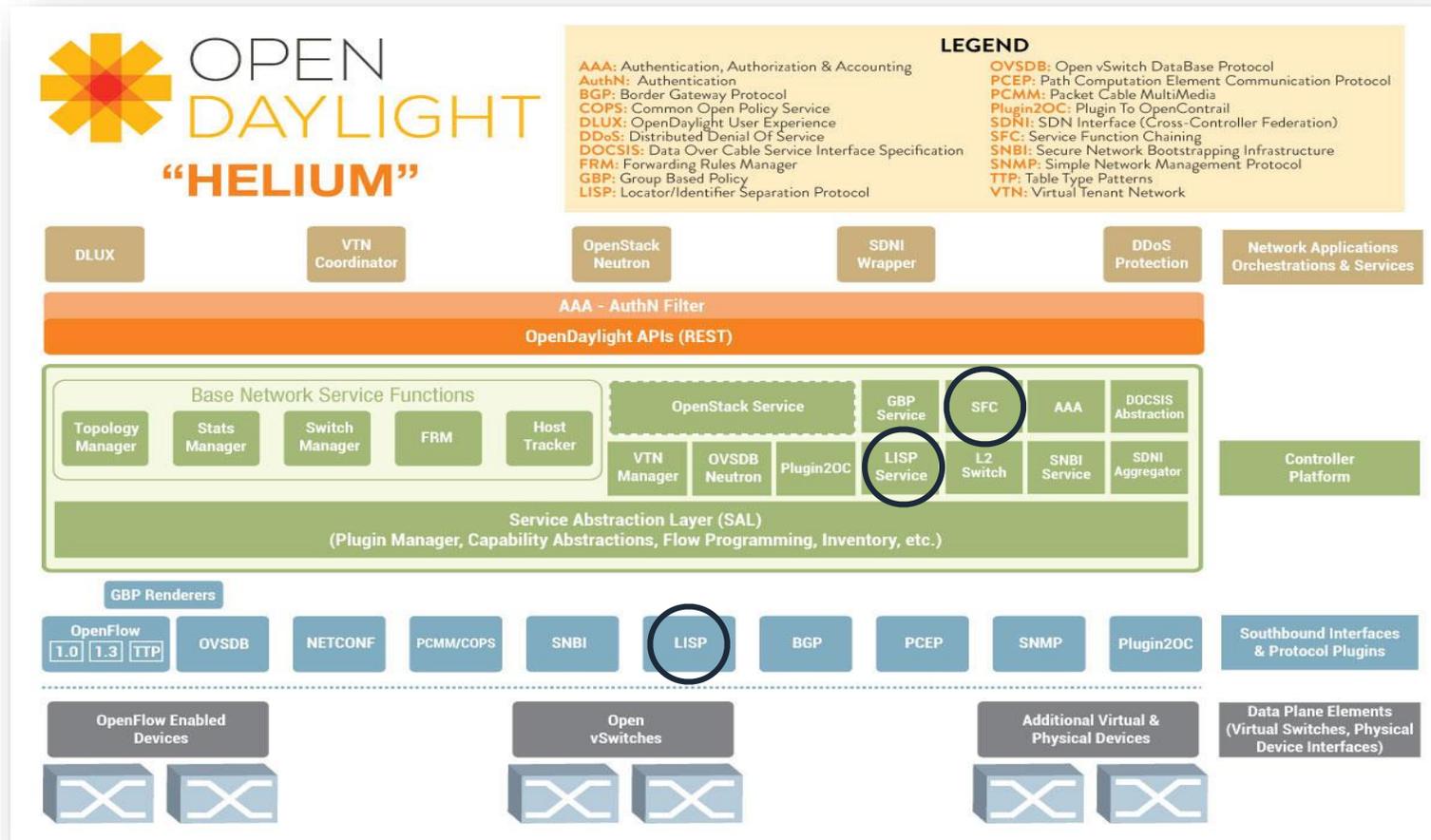
OPENDAYLIGHT
- ContexNet contributed Mapping Service to the OpenDaylight open source SDN project – "Hydrogen" Release & SFC (Service Function Chaining) for "Helium" Release

ETSI
- HPE is active participant in ETSI and is contributing to SWA, EVE WG
- ContexNet POC #15 – "Subscriber Aware Gi-LAN Virtualization: endorsed by ETSI
- Submitted SDN Enabled EPC PoC #34

IETF
- HPE is an active participant in IETF and is contributing for LISP RFC

**OPNFV**
- HPE is an active participant
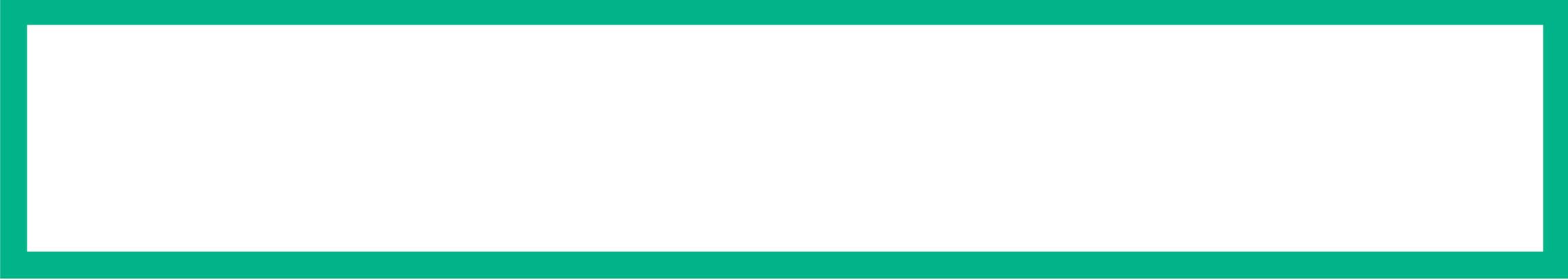
Architecture

ContexNet – Logical
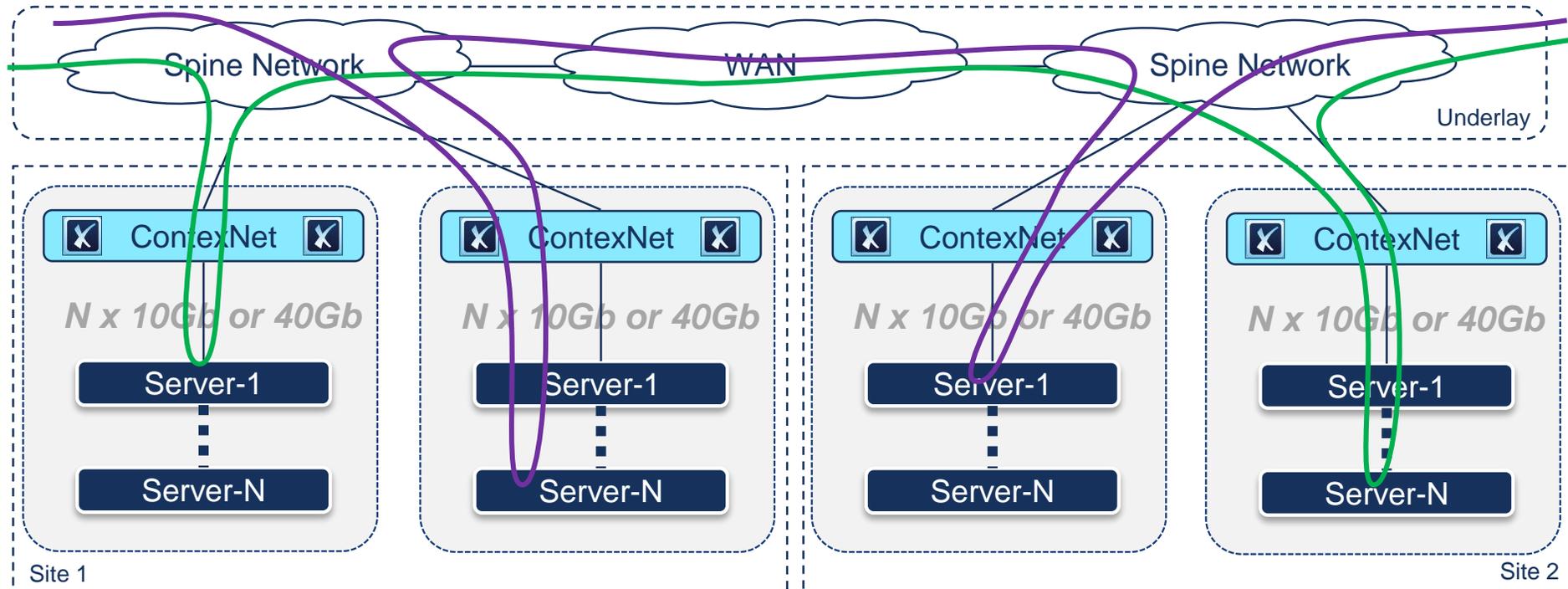
- ContexNet Nodes deployed in each rack/pod
  - Overlay switch, distributed mapping service and federated controller
- Servers implement Virtual Network Functions on VMs
  - Orchestrated via standard protocols (e.g. Openstack)
- Spine network: LAN and/or WAN Underlay
 - All traffic is tunneled / encapsulated by ContexNet

ContexNet – Virtualized Deployment
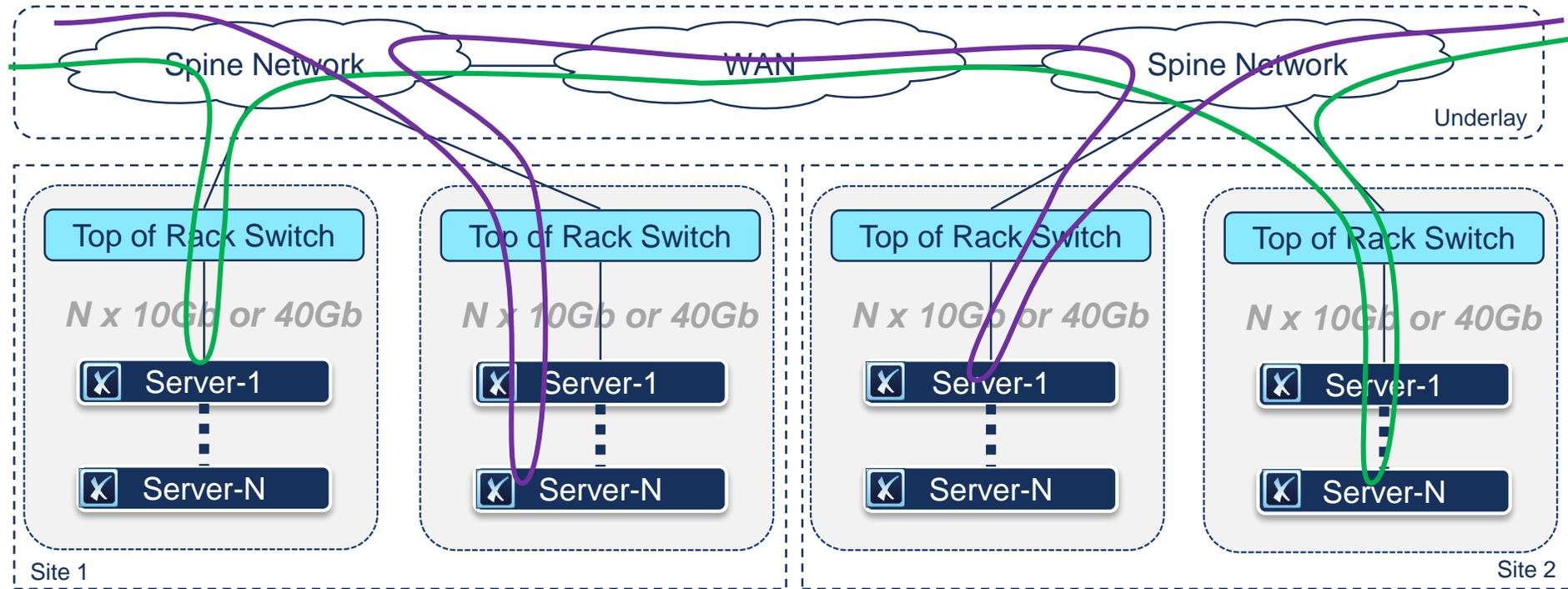
- ContexNet Nodes implemented as VMs
- Overlay tunnels can start in the server

ContexNode: Components

- SDN Controller
  - Programs OpenFlow Switches
  - Federated with all other Controller nodes
  - Based on OpenDaylight

- Mapping Service node
  - Maps identity to location, policy
  - Part of distributed mapping service
  - Enables federation of SDN controllers

- OpenFlow Switches
  - Off-the shelf hardware, software and/or VMs
  - Tunnel traffic to other ContexNet nodes
  - Handle VNF and Subscriber rules

- Brokers
  - Interfaces to external entities
  - Orchestration, AAA, OSS
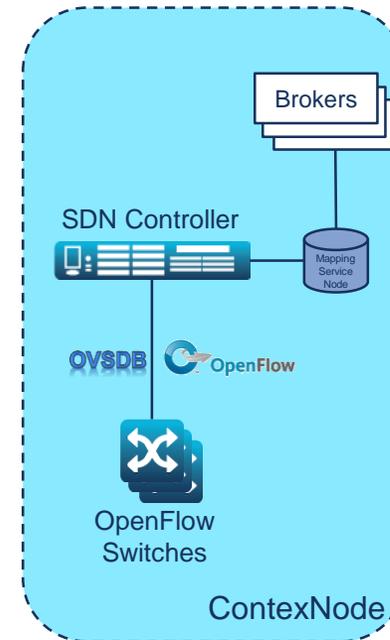
Don't forget. You are not alone. Contact HP NFV BU. http://www.hpenfv.com/

AMS
- Huston
- Ft. Collins

EMEA
- Grenoble
- Tel Aviv

APJ
- Seoul

HP OpenNFV
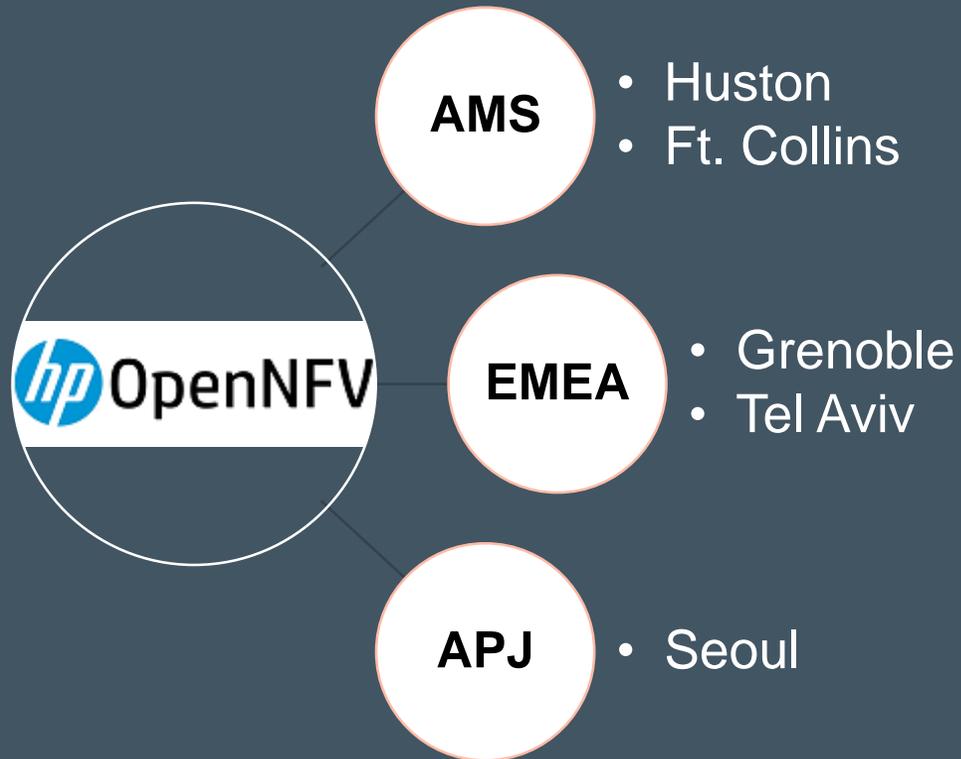
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Thank you

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