

TECH TALK

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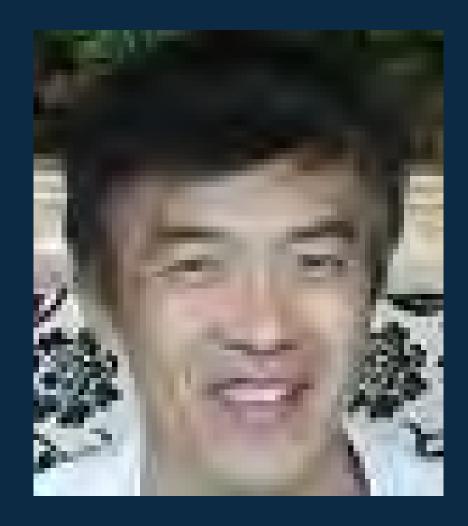
Alvin Ng APJ Data Center Networking Category Manager

Alvin has been with HPE for the last 10 years and previously held roles in Global Accounts, Networking and Storage sales. He was part of APAC Hybrid IT regional sales and transitioned into Aruba in 2019.

As the DCN category manager in Aruba, Alvin's responsibilities include managing the category, developing sales incentive programs, manage new product introductions, managing transitions of DCN product portfolio and also work closely with the APJ Hybrid IT team to drive the DCN business.

Alvin previously spent more than 15 years in the telco industry with AT&T, Lucent Technologies and Avaya and started his career in system engineering designing cellular networks before moving to sales and business development in the region.

Besides an MBA from Nanyang Technological University's Nanyang Business School, Alvin completed his undergraduate studies in the UK with University of Nottingham in Electronics Engineering.



Ubaidali Abdul Razack

Distinguished Technologist, DCN Lead CSE

Ubaid is Distinguished Technologist cum Lead CSE for DCN in APAC. Ubaid is a technologist with more than 20 years of experience on Systems, Network and Security Domains. He is currently specializes in Data Center technologies. Ubaid leads DCN technical community in APJ and working closely with Aruba WW for all DCN regional needs such as technical, enablement, Coordination with TME, GPLM & WW marketing. Ubaid is passionate to Evangelise DCN across APJ tech communities.

Before HPE, Ubaid held a global network Architect role with 3Com where he is responsible to design, deploy and manage 3Com's worldwide network. In that role, he also carried out Global Data Centre migration and setup of R&D centers at India and Taiwan.

Ubaid hold degree in Bachelor of Engineering (Electronics & Communication Engineering), MBA specializing in IT, CISSP and various industry certifications.







TECH TALK

Data Centre Networking/Solutions

Agenda

- Aruba CX for the evolving DC
- Customer used cases
- Network Analytic Engine
- NetEdit
- HIT Integration solutions
- VMWare NSX integration
- o Summary

DATA CENTER EVOLUTION IN THE EDGE TO CLOUD ERA



INFRASTRUCTURE EVERYWHERE

Workloads are being placed where they deliver the best business results









APPLICATION DRIVEN OPERATIONS

DevOps and Agile practices are shaping infrastructure and operations



ARUBA CX NETWORKING FOR THE EVOLVING DATA CENTER



AOS-CX: BUILT ON CLOUDNATIVE PRINCIPLES

Modularity

Faster innovation with independent processes

Programmability

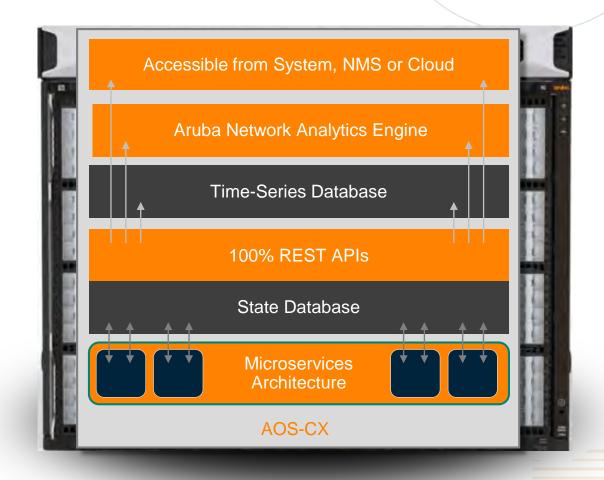
Simplified operations through automation

Resiliency

Stable and reliable microservices design

Elasticity

One operating model from edge access to data center

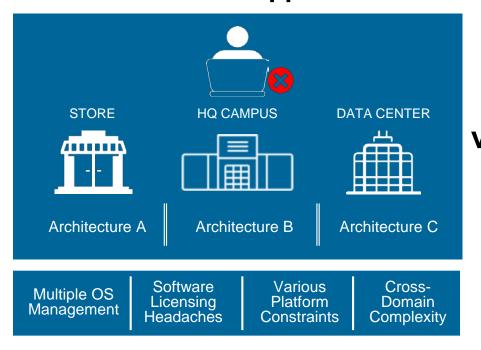




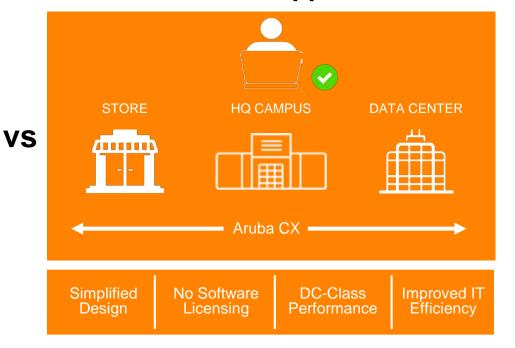
STREAMLINING NETWORK OPERATIONS

CONSISTENT ARCHITECTURE AND OPERATING MODEL FROM EDGE ACCESS TO DATA CENTER

Other Vendor Approaches



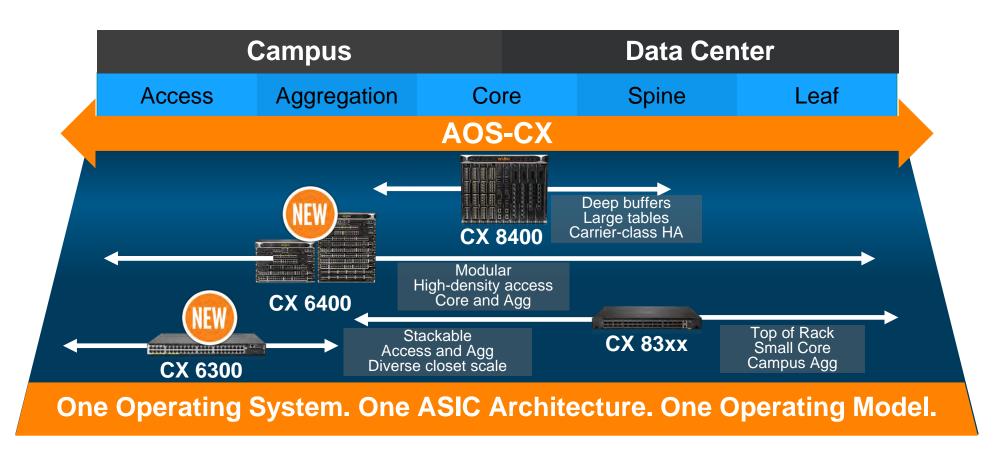
Aruba CX Approach





ARUBA CX SWITCHING FOR THE ENTERPRISE

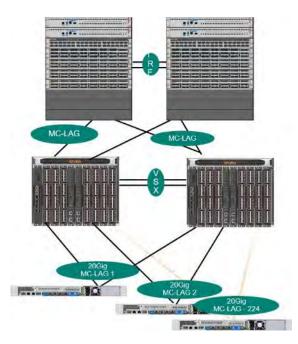
NEW PLATFORMS COMPLETE END-TO-END SWITCHING PORTFOLIO





Cloud Based CRM Provider

Architecture with Aruba 8400 and FlexFabric 12900E



VXLAN (on 12900)
Policy Based Routing

50+ Racks of equipment 60 x 8400's 1,600 MAC Entries

Rack Servers

Large Web scale deployment

Simple Design

Customer wanted AOS-CX benefits

Challenges

Aging infrastructure
Lean IT staff
Operational complexity

Aruba Solution Benefits

- √ Simplified operations
- ✓ Application reliability
- ✓ Faster troubleshooting with Network Analytics Engine
- ✓ HA through Virtual Switching Extension
- ✓Investment protection





ABOUT THE CUSTOMER

Description

Liberal arts college in Pennsylvania with ~2500 students and staff

Buyer

Director of Engineering

Use Case

2nd Data Center location for redundancy

Deal Triggers

2nd Data Center Location for Resiliency

WIN DETAILS

Solution Sold

AOS-CX 8400s (x4) AOS-CX 8325s (x6)

Future Requirements VxLAN

Competition

Looked at Cisco and Arista

CUSTOMER NEEDS

New Data Center Location, needed network Programmability, Automation and Resiliency Easy to implement

HOW WE WON

Success with GCC Core and the 8400 Supporting all current use cases and future needs Vision around Automation and Analytics with NAE

DIFFERENTIATOR(S)

Aruba Network Analytics Engine
VSX Live Upgrade
AOS-CX Programmability

VALUE TO CUSTOMER

AOS-CX provided GCC with the Analytics and Automation vision they needed and success with GCC core using the 8400 made additional investments natural for the 2nd DC expansion



Edge Computing for Immersive Experiences

Renowned NBA team



Helping Fans Create New Memories

Technology in the arena and surrounding district enable connected experiences by delivering custom mobile content and venue specific services

Aruba / HPE Solution

- Connectivity for 18,000 fans and over 6,000 devices for facilities, security, signage, etc.
- 1000+ Aruba wireless access points
- Aruba core, agg and data center switches
- HPE hybrid cloud computing onsite



NAE/NetEdit Demo



SIMPLIFYING THE OPERATOR EXPERIENCE FROM DAY 0 THROUGH DAY 2 OPERATIONS

Install a new switch to the network using mobile app and connect to management



New switch and its config are automatically imported

Resolve issues using always-on monitoring with built-in diagnostics and dynamic actions within every node

Manage, automate, validate, and verify configuration and network state including compliance

SIMPLIFIED INSTALL AND CONFIGURATION ARUBA CX MOBILE APP

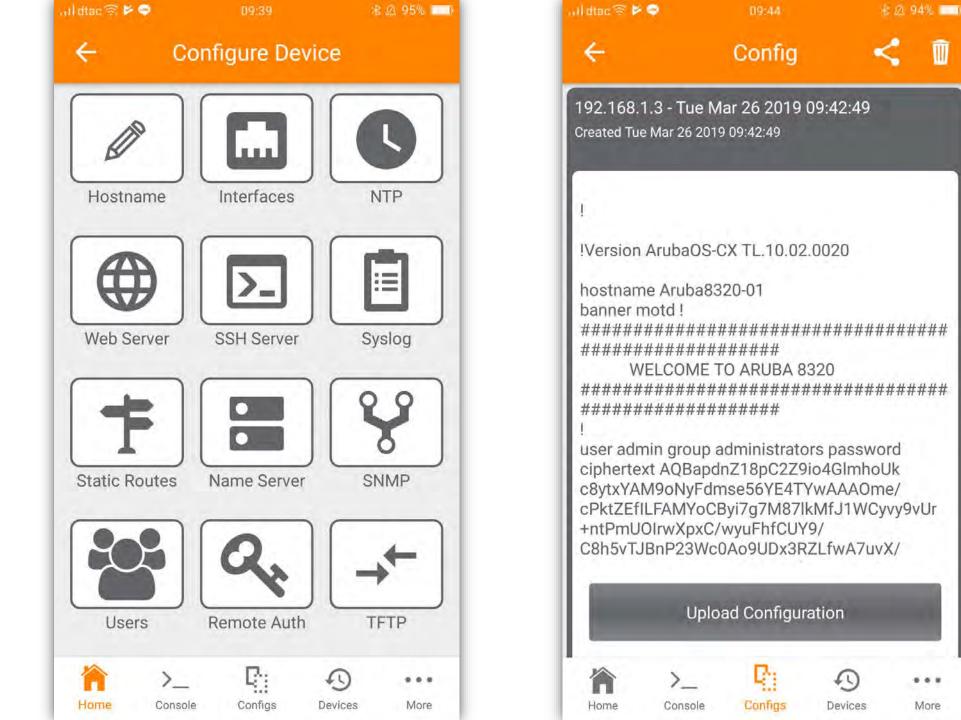


- Aruba-CX app available in Apple and GooglePlay app stores
- Creates an SSH session with the target device
- Offers mobile-friendly switch management as well as a CLI



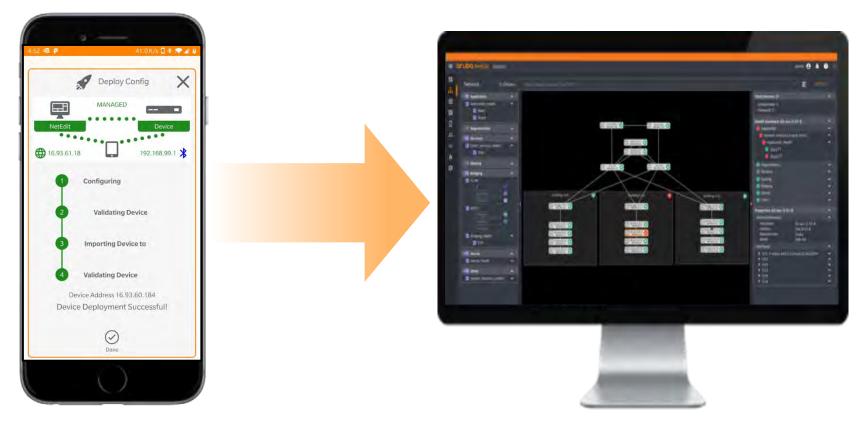
- Mobile app provides the visibility and convenience needed for today's fast paced IT
- Connectivity via Bluetooth setting up switches quick and easy
- Configure, view and manage configurations
- Simple to use built-in templates save time and cut down on errors
- Integration with Aruba NetEdit allows for intelligent and validated configuration conformance
- Quickly check the PoE budget and utilization on switches from the CX Mobile app home screen to see available PoE
- Auto-detection of potential stack members and stack links makes it go from independent switches to a virtualized stack with just a few taps

The Aruba CX Mobile App is subscription free and is available to download at https://www.arubanetworks.com/products/networking/switches/cx-mobileapp/



NetEdit and AOS-CX Mobile App

Modernizing the Operator experience



CX-Mobile App

Quickly deploy provision and update switches

NetEdit 2.0

Modern operator experience with actionable insights

NetEdit for Configuration, Automation and Verification Enhance the Data Center Operational Experience, Minimize Downtime

Search

Edit

Validate

Deploy

Audit

Natural CLI-Driven Automation

Quickly push updates to Data Center Network

Conformance Checking

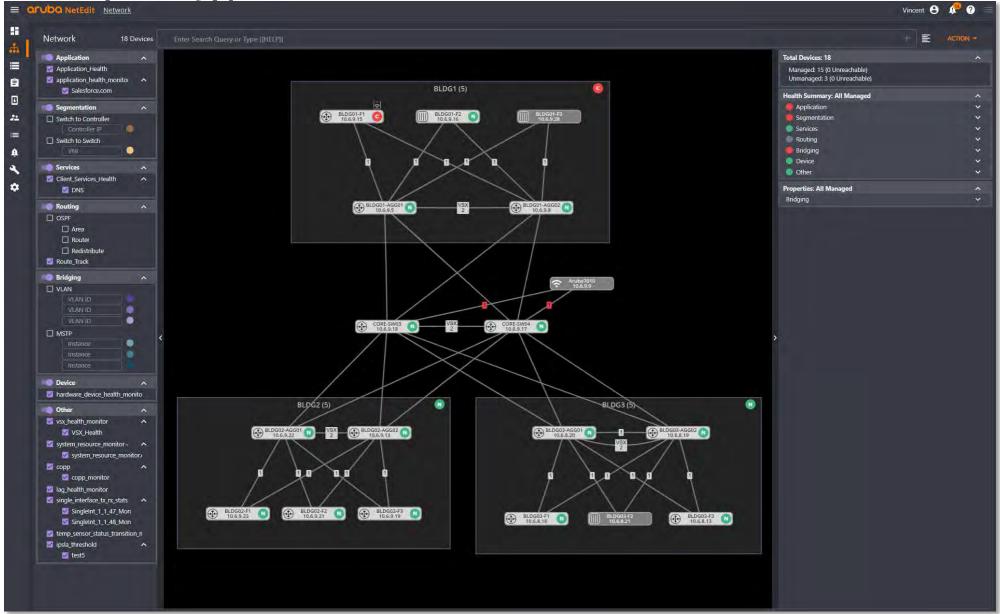
Catch config errors before deployment

Automatic Change Validation

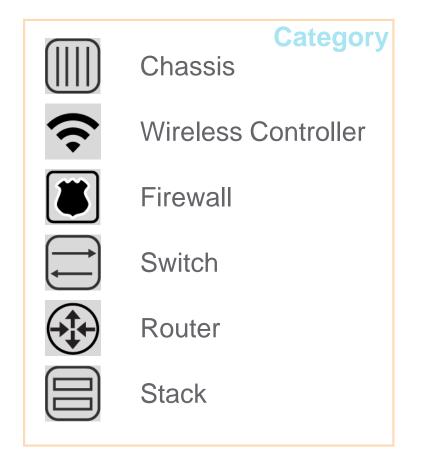
Ensure successful change window

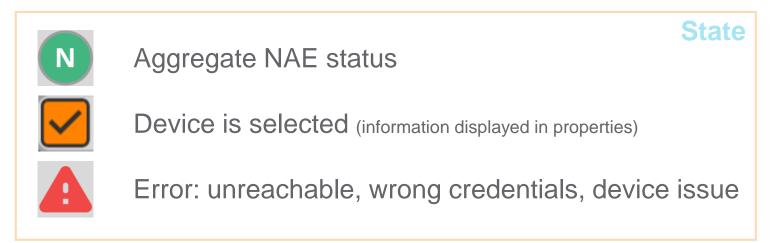


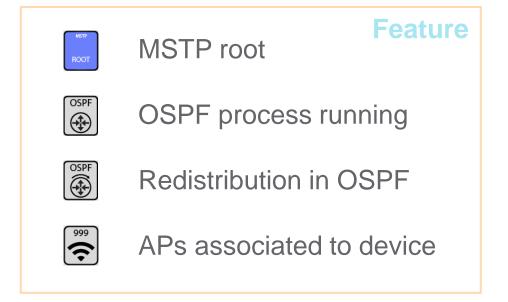
Topology View



Device Indicators
Various Icons and badges based upon the category, the state and the feature of the device







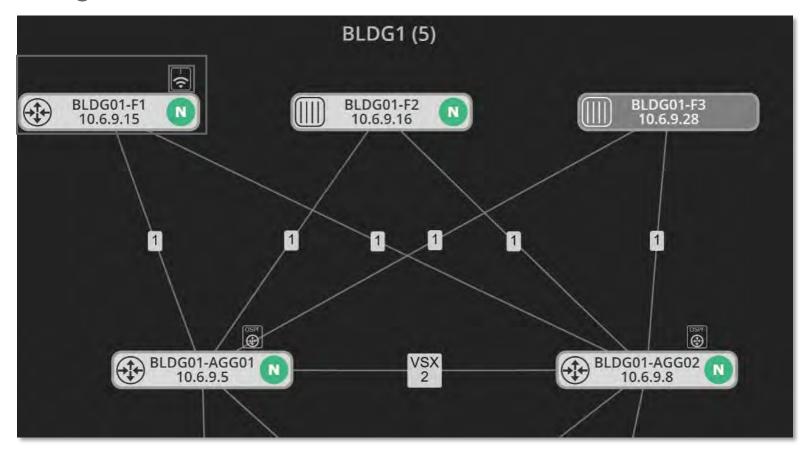
Selection Effect OSPF Badges





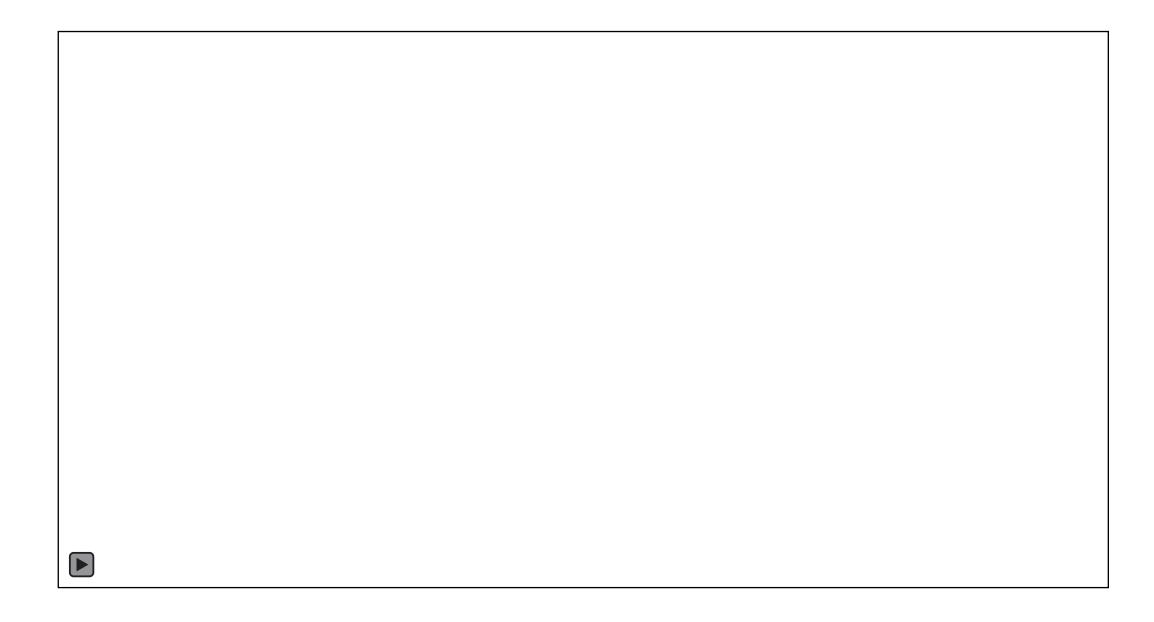


Attached Wireless APs Badge with number of APs



Help administrator to evaluate Campus Wireless service impact

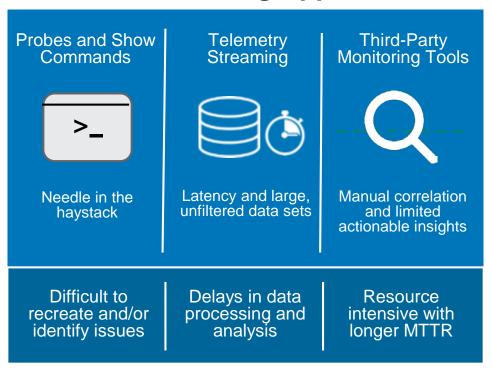
NetEdit - Demo



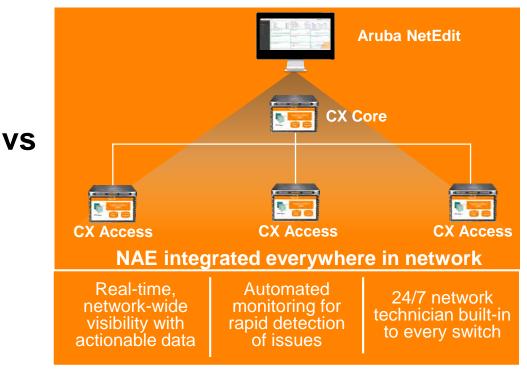
TURNING NETWORK TELEMETRY INTO ACTIONABLE INSIGHTS

INTELLIGENT PRE-PROCESSING WITH ARUBA NETWORK ANALYTICS ENGINE

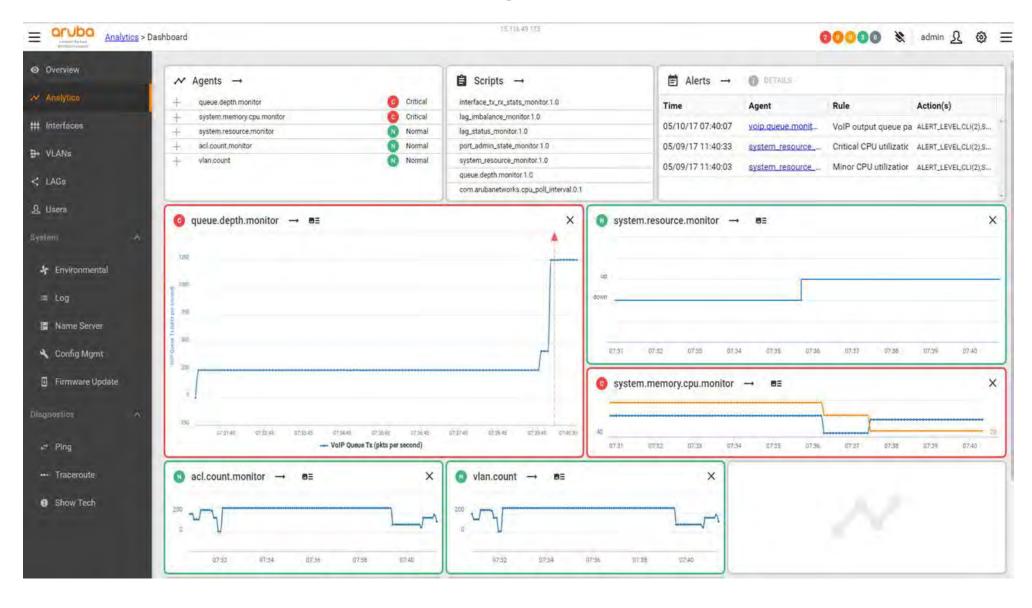
Other Monitoring Approaches



Aruba CX Approach

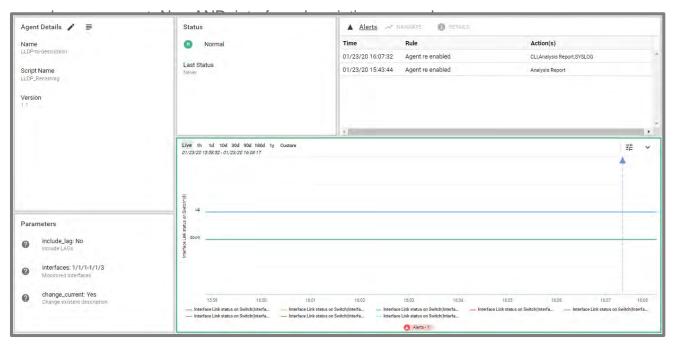


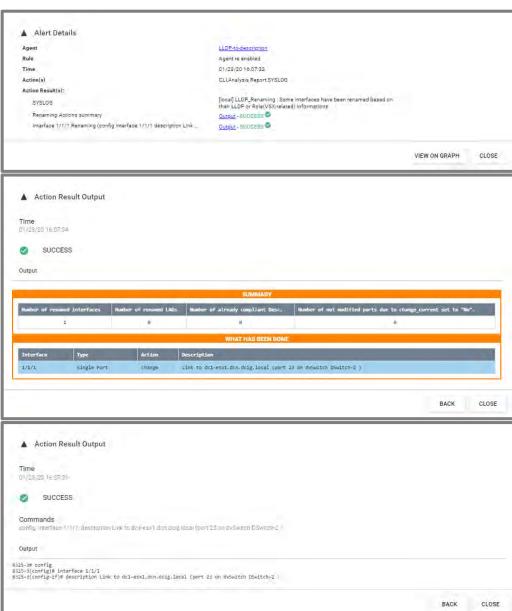
Aruba Network Analytics Engine at Work



NAE - LLDP agent

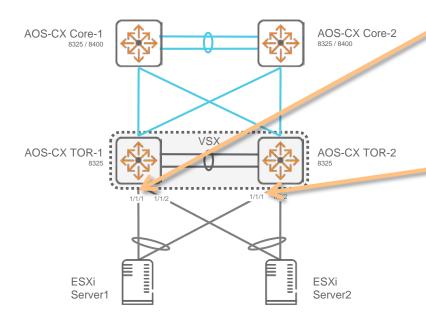
- change_current=Yes AND no interface description => change i/f description
- change_current=Yes AND improper interface description => change i/f description
- change_current=Yes AND proper interface description => no change





Problem Statement

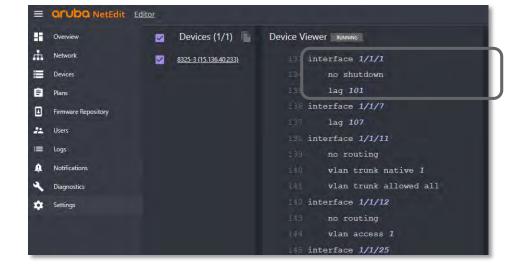
Updated Connectivity Information



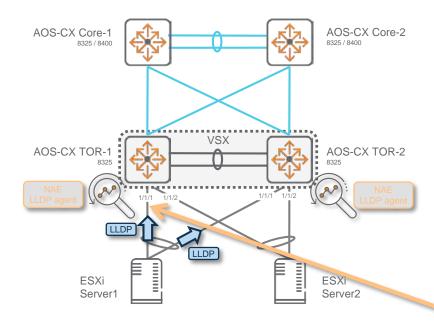


```
TOR-1# show run
Current configuration:
!
!Version ArubaOS-CX GL.10.03.0020
hostname 8325-1
...
interface 1/1/1
no shutdown
description ?
...
```

```
TOR-2# show run
Current configuration:
!
!Version ArubaOS-CX GL.10.03.0020
hostname 8325-1
...
interface 1/1/1
   no shutdown
   description ?
...
```



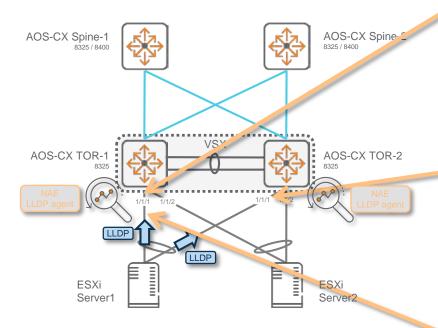
Automated Interface Description From LLDP information



```
TOR-2# show lldp neighbor-info 1/1/1
                               : 1/1/1
Port
Neighbor Entries
                               : 1
Neighbor Entries Deleted
                               : 0
Neighbor Entries Dropped
                               : 0
Neighbor Entries Aged-Out
Neighbor Chassis-Name
                               : dc1-esx1.dcn.dcig.local
Neighbor Chassis-Description
                              : VMware ESX Releasebuild-13004031
Neighbor Chassis-ID
                               : vmnic1
Neighbor Management-Address
Chassis Capabilities Available : Bridge
Chassis Capabilities Enabled
                              : Bridge
Neighbor Port-ID
                               : 00:50:56:51:e1:05
Neighbor Port-Desc
                               : port 23 on dvSwitch DSwitch-2 (etherswitch)
Neighbor Port VLAN ID
TTL
                               : 180
```

OUTCOME

Connectivity Information is automatically updated



```
TOR-1# show run
Current configuration:
!
!Version ArubaOS-CX GL.10.03.0020
hostname 8325-1
...
interface 1/1/1
no shutdown
description Link to dc1-esx1.dcn.dcig.local (port 22 on dvSwitch DSwitch-2 (etherswitch))
...

TOR-2# show run
Current configuration:
```

```
!Version ArubaOS-CX GL.10.03.0020
hostname 8325-1
...
interface 1/1/1
no shutdown
description Link to dc1-esx1.dcn.dcig.local (port 23 on dvSwitch DSwitch-2 (etherswitch))
...

TOR-2# show lldp neighbor-info 1/1/1
Port : 1/1/1
```

```
Neighbor Entries
                               : 1
Neighbor Entries Deleted
                               : 0
Neighbor Entries Dropped
                               : 0
Neighbor Entries Aged-Out
                               : dc1-esx1.dcn.dcig.local
Neighbor Chassis-Name
Neighbor Chassis-Description
                              : VMware ESX Releasebuild-13004031
Neighbor Chassis-ID
                               : vmnic1
Neighbor Management-Address
Chassis Capabilities Available : Bridge
Chassis Capabilities Enabled
                             : Bridge
Neighbor Port-ID
                               : 00:50:56:51:e1:05
Neighbor Port-Desc
                               : port 23 on dvSwitch DSwitch-2 (etherswitch)
Neighbor Port VLAN ID
TTL
                               : 180
```

Aruba NAE - Network Analytics Engine Demo

Intergration with HIT solutions



Support for HPE Servers and Systems products

Support matrix

ARUBA PLATFORMS: 832X

- 8320: JL479A—Aruba 8320 48 10/6 40 X472 5 2 Bdl
- 8325:
- -F2B Airflow: JL624A-Aruba 8325 48p25G/8p100G 6F2B F 2F2B PS
- -B2F Airflow: JL625A-Aruba 8325 48p25G/8p100G 6B2F F 2B2F PS

HIT DAC SUPPORT LIST

HIT SKU	Description	
487655-B21	HPE BLc 10G SFP+ SFP+ 3m DAC	
537963-B21	HPE BLc 10G SFP+ SFP+ 5m DAC	
844477-B21	HPE 25Gb SFP28 to SFP28 3m DAC	
844480-B21	HPE 25Gb SFP28 to SFP28 5m DAC	

LEARN MORE AT

hpe.com/info/servernetworking

Make the right purchase decision. Contact our presales specialists.







https://arubapedia.arubanetworks.com/arubapedia /index.php/ArubaOS-Switch and CX Transceivers

ARUBA DAC SUPPORT LIST

SKU	Description	
J9281B (D)	Aruba 10G SFP+ to SFP+ 1m DAC	
J9283B (D)	Aruba 10G SFP+ to SFP+ 3m DAC	
JL487A	Aruba 25G SFP28 to SFP28 0.65m DAC	
JL488A	Aruba 25G SFP28 to SFP28 3m DAC	
JL489A	Aruba 25G SFP28 to SFP28 5m DAC	

HIT NIC SUPPORT LIST

sku	Description	
817749-B21	HPE Ethernet 10/25Gb 2-port 640FLR-SFP28 Adapter	
817753-B21	HPE Ethernet 10/25Gb 2-port 640SFP28 Adapter	
P11338-B21	HPE Ethernet 10Gb 2-port 548SFP+ Adapter	
P08446-B21	HPE Ethernet 10Gb 2-port 524SFP+ Adapter	
727055-B21	HPE Ethernet 10Gb 2-port 562SFP+ Adapter	
727054-B21	HPE Ethernet 10Gb 2-port 562FLR-SFP+ Adapter	
656596-B21	HPE Ethernet 10Gb 2-port 530T Adapter	
700759-B21	HPE FlexFabric 10Gb 2-port 533FLR-T Adapter	
817745-B21	HPE Ethernet 10Gb 2-port 562FLR-T Adapter	
817738-B21	HPE Ethernet 10Gb 2-port 562T Adapter	
817709-B21	HPE Ethernet 10/25Gb 2-port 631FLR-SFP28 Adapter	
817718-B21	HPE Ethernet 10/25Gb 2-port 631SFP28 Adapter	



Aruba CX 6300 switching integration with HIT platform

APJ led 6300 (JL658A with HIT Compute volume) – positioned for small DC

Aruba6300 – JL658A with connectivity (1/10G)	DL360/DL380 with connectivity (1/10G) NIC	Test Cases
Aruba 10G SFP+ to SFP+ 1m DAC Cable (J9281D)	HPE Ethernet 10Gb 2-port 562SFP+ Adptr (Intel- 727055-B21)	Basic Connectivity – Layer1 (Physical)
Aruba 10G SFP+ to SFP+ 3m DAC Cable (J9283D)	HPE Ethernet 10Gb 2-port 562FLR-SFP+Adptr (Intel- 727054-B21)	Link Layer (Logical), Layer 2
Aruba 10G SFP+ LC SR 300m MMF Transceiver (J9150D)	HPE Ethernet 10Gb 2P 530SFP+ Adptr (Broadcom – 652503-B21)	Layer 3, IP Test inc GW tests
Aruba 10GBASE-T SFP+ RJ45 30m Cat6A Transceiver (JL563A)	HPE Eth 10Gb 2p 562FLR-T Adptr (Intel – 817745-B21)	Jumbo Frames, large MTU
Aruba 1G SFP RJ45 T 100m Cat5e Transceiver (J8177D)	HPE Ethernet 10Gb 2P 530T Adptr (Marvell – 656596-B21)	Single Switch, VSF pair HA
	HPE Eth 10Gb 2p 562T Adptr (Intel – 817738-B21)	VSF with LACP on server end
	HPE Ethernet 1Gb 4P 331FLR Adptr (Broadcom – 629135-B22)	NICs with Windows 2016 drivers
	HPE Ethernet 1Gb 4-port 366FLR Adapter (Intel – 665240-B21)	NICs with standlaone and teamed

- > Details of NIC, DAC, Transceiver combinations are in following slides
- > VSF switch interconnects were tested and verified with following DAC cables:
 - ✓ 10G (1M/3M), 25G (0.65M/3M/5M) and 50G (0.65M/3M) DACs from Aruba

HPE SimpliVity + Aruba Networks

Automating Provisioning for rapid edge data center deployment



Accelerate

deployment of ROBO
/ Edge sites

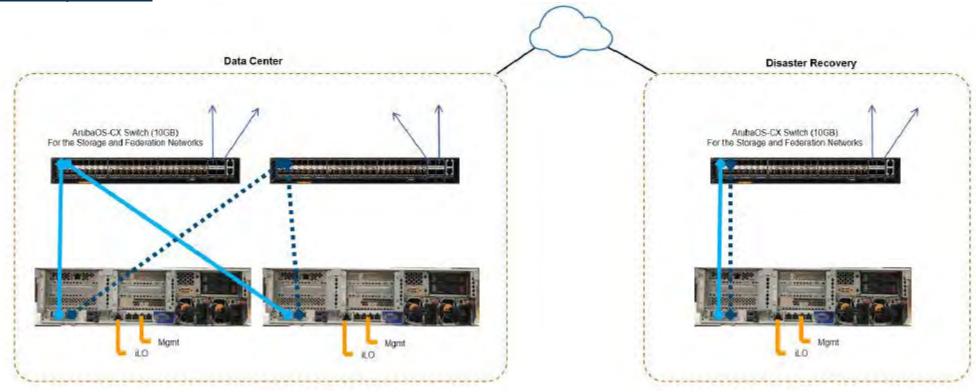
Automate and eliminate configuration errors



HPE Simplivity - Connectivity Options

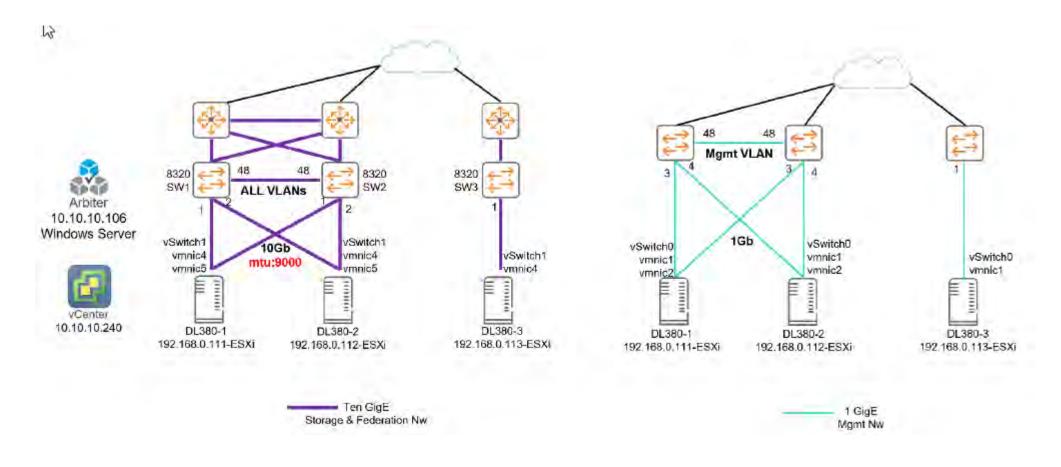
- Common deployment scenario = HA the Omnicubes to pair of ToRs
- Aruba / Simplivity VRD as tested in TME LAB :

• https://community.arubanetworks.com/t5/Validated-Reference-Design/HPE-SimpliVity-Cluster-Interop-with-ArubaOS-CX-Switch/ta-p/503116



HPE Simplivity Connectivity Options

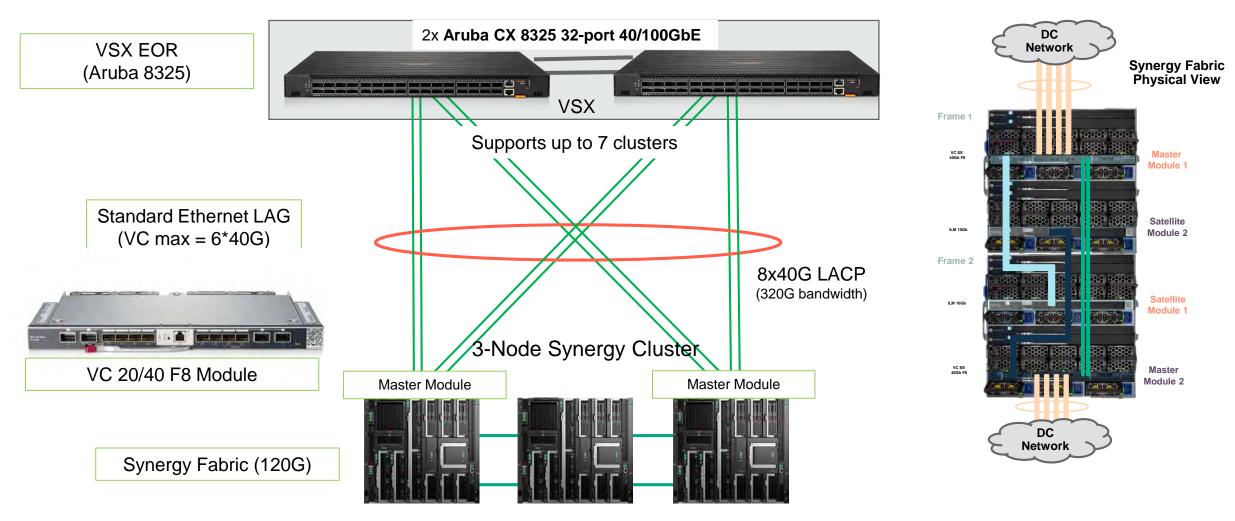
- Aruba OS-CX 8320 SFP+ switches providing Federation and Storage connectivity
- Aruba OS-CX 8320/6300 BaseT switches providing Management connectivity



Synergy Fabric integration

Single-tier Fabric with ArubaOS CX - 8325

ArubaOS CX - VSX as EOR



ArubaOS-CX Switches VSX Cluster Interconnect with HPE Synergy:

https://community.arubanetworks.com/t5/Validated-Reference-Design/ArubaOS-CX-Switches-VSX-Cluster-Interconnect-with-HPE-Synergy/ta-p/513107

VMware NSX-V 8325 Integration

Used in environments with NSX, VMs and bare metal servers **NSX** Manager Provides L2 network connectivity between VMs (on ESXi hosts) and 6.4.5 Bare Metal Servers connected to the Hardware VTEP switch 10.10.10.14/24 (8325/5940) vCenter 6.7 10.10.10.15/24 More details at: **NSX Controller** VMware NSXv and 8325 Integration Guide 6.4.5 **OVSDB** 10.10.10.18/24 **VXLAN Overlay Tunnels** uplink 99.99.11.101/24 OOBM control plane 10.10.10.163/24 **Underlay** 8325 Network 1/1/40 uplink uplini 99.99. 1 121/24 99.99.11.122/24 **Bare Metal** VM1 VM2 101.1.0.11/24 101.1.0.12/24 101.1.0.13/24

Aruba switching + VMware NSX-V

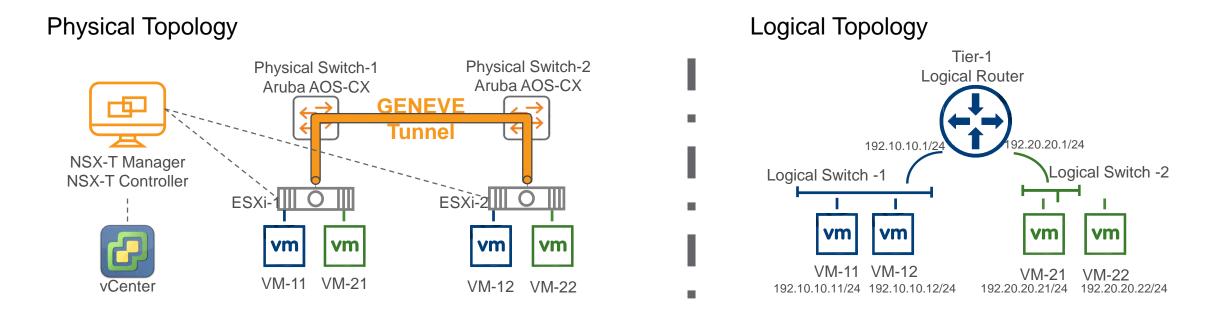
VMware Compatibility Guide

https://www.vmware.com/resources/compatibility/search.php?deviceCategory=hvxg&details=1&partners=515&page=1&display_interval=10&sortColumn=Partner&sortOrder=Asc

Partner Name	Hardware Model	Switch Software Version (*)	NSX Version	Solution Topology
Hewlett Packard Enterprise	5940	Version 7.1 R2612P02	NSX 6.4.1	Standalone
Hewlett Packard Enterprise	Aruba 8325	ArubaOS-CX 10.04.0030	NSX 6.4.4	Standalone
Hewlett Packard	HPE StoreFabric SN2000M Series	ONYX-X86_64-3.8.1112	NSX 6.4.6	Standalone
Enterprise			NSX 6.4.5	Standalone

NSX-T GENEVE Tunnel over AOS-CX

- Provides L2,L3 network connectivity between VMs using GENEVE Tunnels
- ESXi Servers are connected with Aruba AOS-CX Switches using IP connectivity



More details at:

NSX-T Interop white-paper

Aruba 8400/832x Success: 900+ Customers & growing

North America

School districts

Defense research lab

Manufacturing

State government agency

Universities

Casino

Transportation

Grocery chain

Electricity provider

Technology company

Media

Health Center

Apparel retailer

••

EMEA

Universities

Manufacturing

Diversified conglomerate

Public prosecution service

Boarding school

City government

Media

..

APJ

Transportation

Universities

Manufacturing

Technology

Financial services

Media

City government

Aerospace

ì.

Latin America

Casino

Airport concessions

Oil & Gas

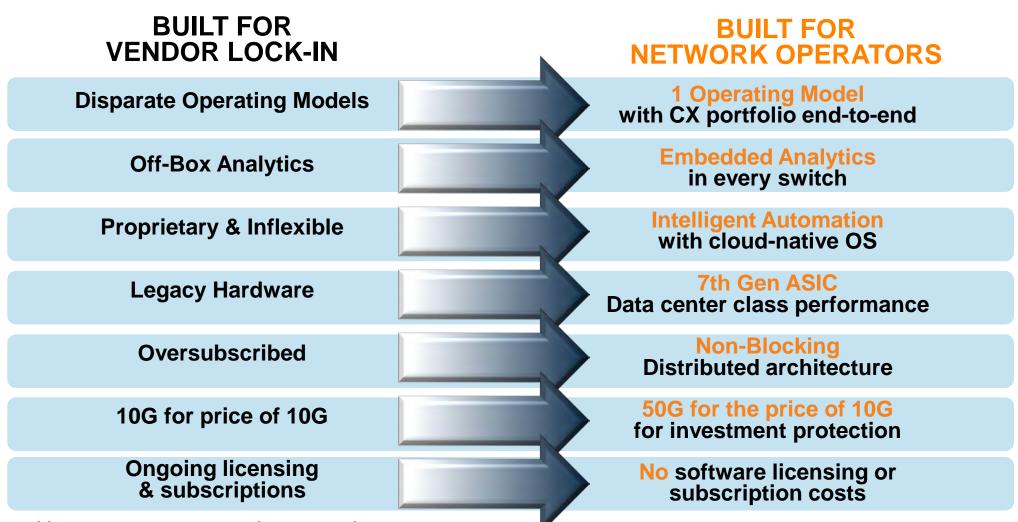
Media

Universities

...



THE COMPETITION VS ARUBA CX





https://packetpushers.net/podcast/heavy-networking-514-arubas-vision-extends-from-the-data-center-to-the-edge-sponsored/



Thank you