

April 2020

aruba
a Hewlett Packard
Enterprise company

Switch Forward with ArubaOS-CX

Performance, scale and intelligence
for modern enterprise networks

Richard Litchfield
APJ Category Manager – Campus Switching

Discussion Points

- ArubaOS-CX
Next Generation Switching
- CX Switch Portfolio
- NAE, NetEdit and more
- Q&A



Next Generation Switching

The background features a large, light red curved shape on the left and top, and a large orange curved shape on the right and bottom. In the bottom right corner, there is a series of horizontal grey lines that appear to be part of a larger graphic element.

INTRODUCING THE ARUBA ARCHITECTURE

Integration with IT Workflows and IOT Use Cases
Robust Ecosystem of Edge Technology Partners

Elasticity for Any Size Deployment
Unified Data Set for Analytics & AI

Limited Reliance on Underlying Connectivity
Flexibility to Use Existing Segmentation

Unified Operating Model
IOT Ready

Ecosystem Apps

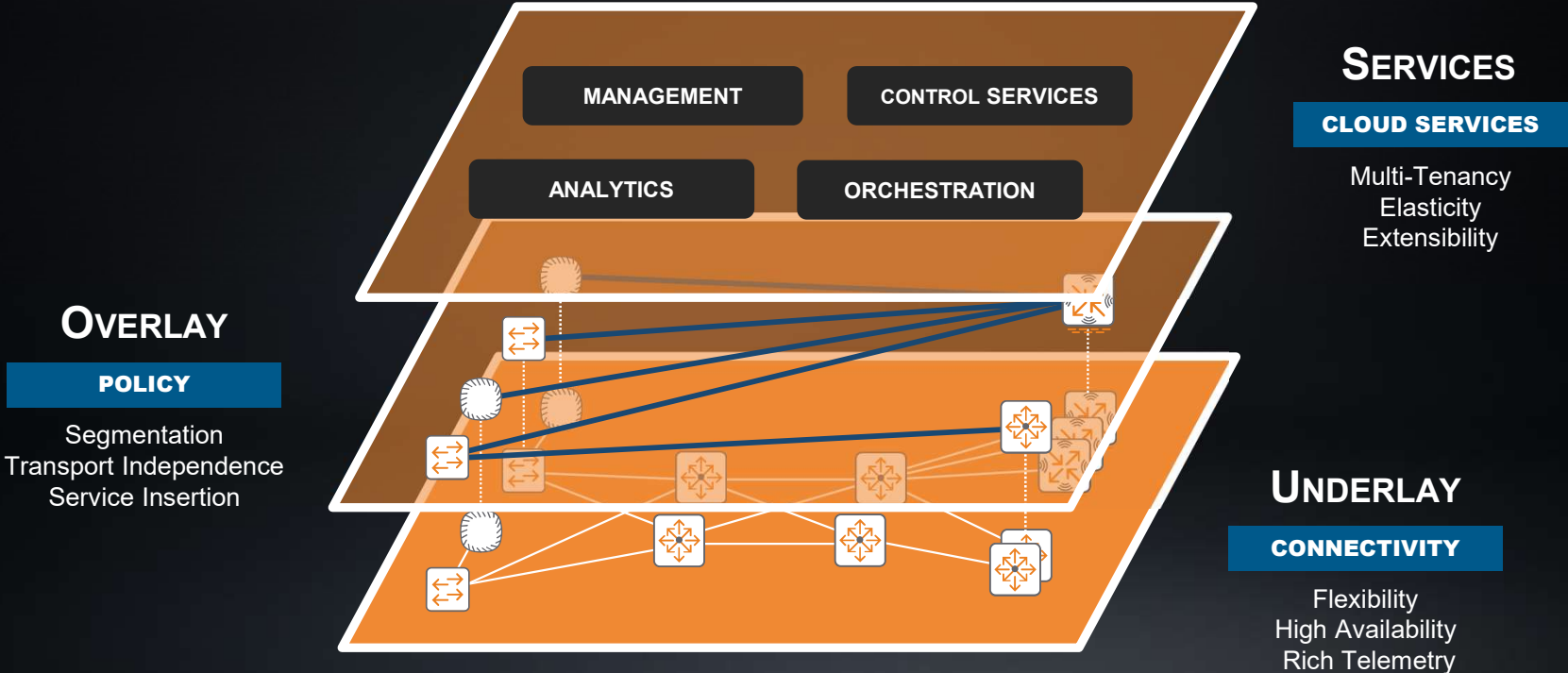
Cloud Services

Policy

Connectivity



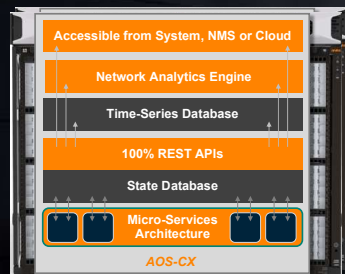
THE ARUBA ARCHITECTURE BUILT ON BEST PRACTICE



ARUBA CX SWITCHING

NEXT-GEN, CLOUD-NATIVE SWITCHING DESIGNED FOR THE NETWORK OPERATOR

AOS-CX

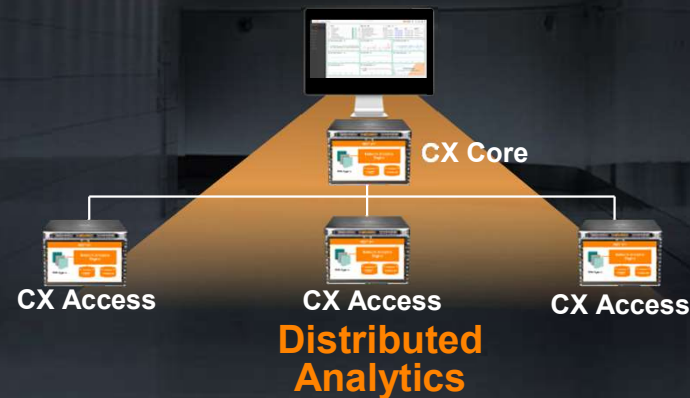


Cloud Native

Modern, microservices architecture for full network programmability and workflow automation

No Software Licensing

Aruba NetEdit and Network Analytics Engine



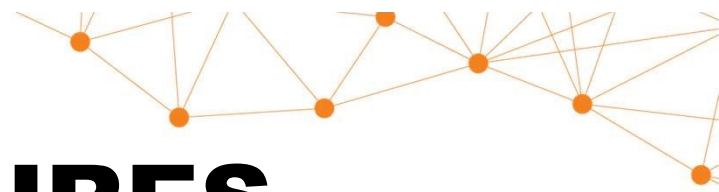
Analytics in every node for network-wide, real-time insights to proactively detect and resolve issues

Aruba CX Switches



Edge Access to Data Center

Flexibility to deploy same hardware and software for a consistent operational experience from edge access to data center



AOS-CX KEY FEATURES

DRIVERS: SHRINKING MAINTENANCE WINDOWS, SECURITY, WI-FI 6

VSX Live Upgrades



Extended to Access

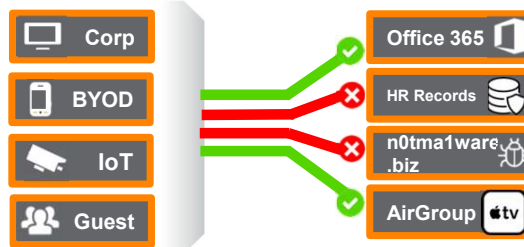
Dual control and data planes with improved performance to bring live upgrades to modular access

Always-on PoE



Enable APs, healthcare devices, sensors, and IoT devices to keep power during upgrades

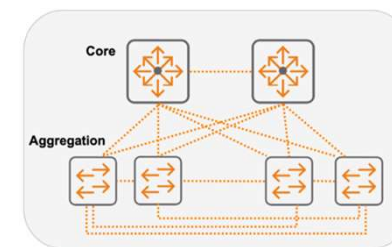
Dynamic Segmentation



Extended to Access and AOS-CX

Secure, unified access across wired and wireless for users and IoT, enabled by policy-based automation

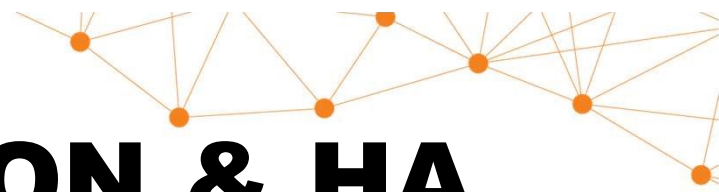
VXLAN with MP-BGP EVPN



Extended to Access

Industry-standard segmentation that scales and provides consistent architecture across campus and data center

**140+ new features
and 5th major AOS-CX Release**

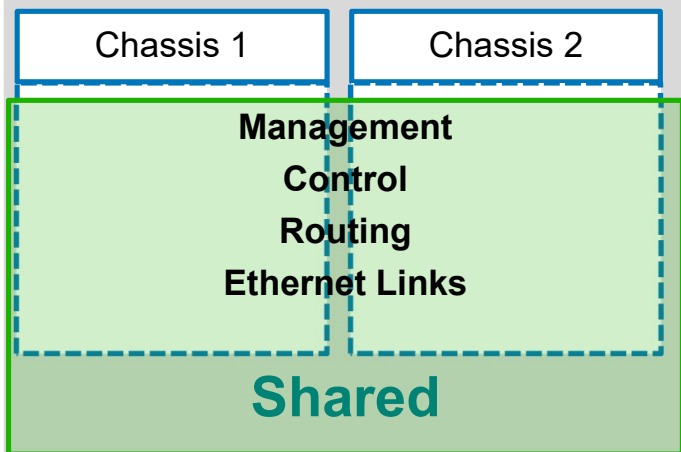


ARUBA VIRTUALIZATION & HA

SEGMENTATION MUST BE SECURE, DYNAMIC, AND SIMPLE TO DEPLOY

Aruba VSF

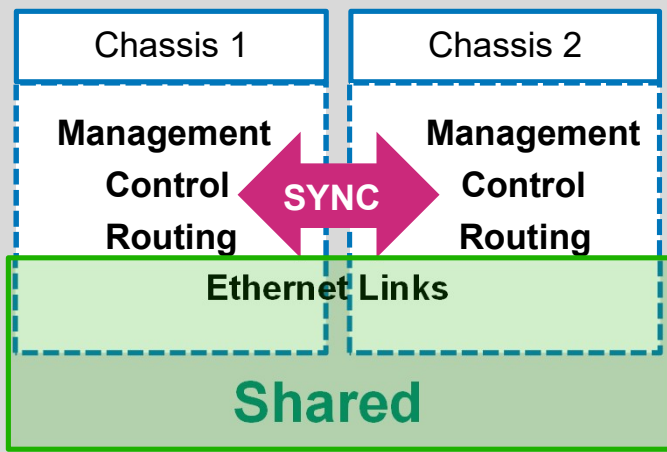
Stacking for access



CX 6300

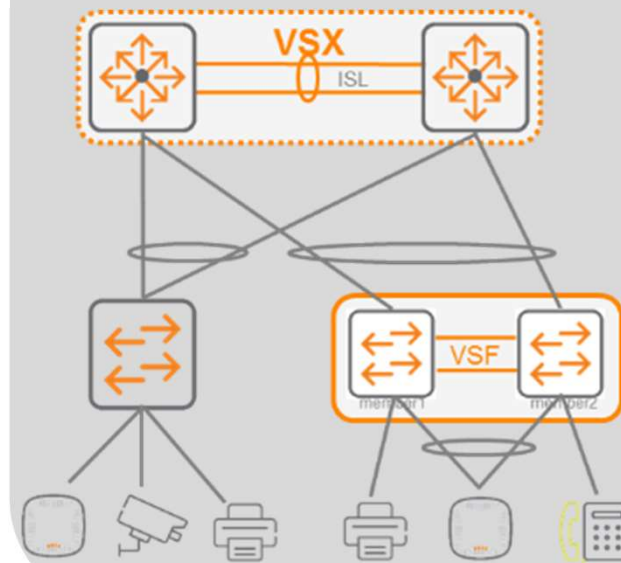
Aruba VSX

HA for core/agg/data center

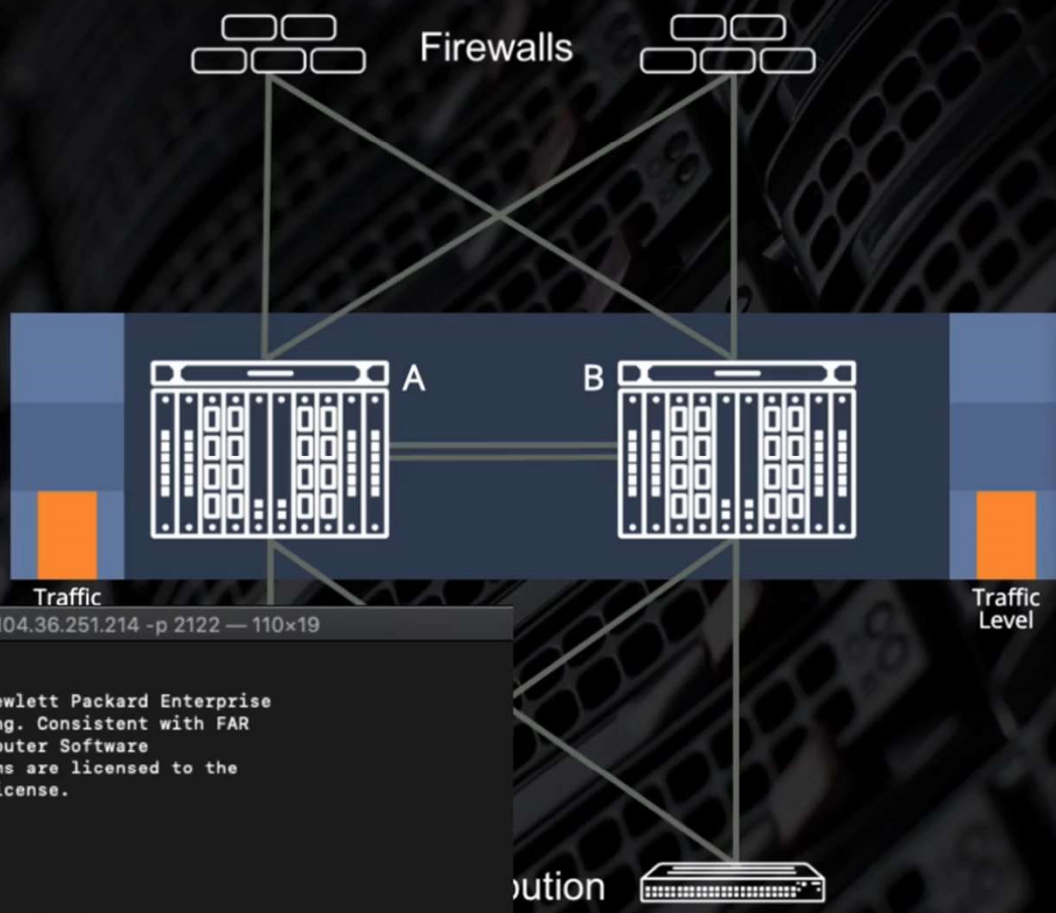


CX 6400, CX 8xxx

Deployment



INITIAL STATE - BEFORE UPGRADE



```

joneostebo — Switch A — ping 104.36.251.214 — 65x20
64 bytes from 104.36.251.214: icmp_seq=484 ttl=59 time=1.537 ms
64 bytes from 104.36.251.214: icmp_seq=485 ttl=59 time=1.045 ms
64 bytes from 104.36.251.214: icmp_seq=486 ttl=59 time=1.080 ms
64 bytes from 104.36.251.214: icmp_seq=487 ttl=59 time=1.307 ms
64 bytes from 104.36.251.214: icmp_seq=488 ttl=59 time=1.010 ms
64 bytes from 104.36.251.214: icmp_seq=489 ttl=59 time=1.015 ms
64 bytes from 104.36.251.214: icmp_seq=490 ttl=59 time=2.748 ms
64 bytes from 104.36.251.214: icmp_seq=491 ttl=59 time=1.080 ms
64 bytes from 104.36.251.214: icmp_seq=492 ttl=59 time=1.613 ms
64 bytes from 104.36.251.214: icmp_seq=493 ttl=59 time=1.051 ms
64 bytes from 104.36.251.214: icmp_seq=494 ttl=59 time=0.937 ms
64 bytes from 104.36.251.214: icmp_seq=495 ttl=59 time=0.997 ms
64 bytes from 104.36.251.214: icmp_seq=496 ttl=59 time=1.443 ms
64 bytes from 104.36.251.214: icmp_seq=497 ttl=59 time=0.971 ms
64 bytes from 104.36.251.214: icmp_seq=498 ttl=59 time=1.140 ms
64 bytes from 104.36.251.214: icmp_seq=499 ttl=59 time=1.164 ms
64 bytes from 104.36.251.214: icmp_seq=500 ttl=59 time=1.083 ms
64 bytes from 104.36.251.214: icmp_seq=501 ttl=59 time=1.041 ms
64 bytes from 104.36.251.214: icmp_seq=502 ttl=59 time=1.033 ms

```

```

joneostebo — Switch B — ping 104.36.251.215 — 65x21
64 bytes from 104.36.251.215: icmp_seq=425 ttl=59 time=1.103 ms
64 bytes from 104.36.251.215: icmp_seq=426 ttl=59 time=0.998 ms
64 bytes from 104.36.251.215: icmp_seq=427 ttl=59 time=1.045 ms
64 bytes from 104.36.251.215: icmp_seq=428 ttl=59 time=1.028 ms
64 bytes from 104.36.251.215: icmp_seq=429 ttl=59 time=0.970 ms
64 bytes from 104.36.251.215: icmp_seq=430 ttl=59 time=1.091 ms
64 bytes from 104.36.251.215: icmp_seq=431 ttl=59 time=1.061 ms
64 bytes from 104.36.251.215: icmp_seq=432 ttl=59 time=1.055 ms
64 bytes from 104.36.251.215: icmp_seq=433 ttl=59 time=0.965 ms
64 bytes from 104.36.251.215: icmp_seq=434 ttl=59 time=0.966 ms
64 bytes from 104.36.251.215: icmp_seq=435 ttl=59 time=0.986 ms
64 bytes from 104.36.251.215: icmp_seq=436 ttl=59 time=1.016 ms
64 bytes from 104.36.251.215: icmp_seq=437 ttl=59 time=0.993 ms
64 bytes from 104.36.251.215: icmp_seq=438 ttl=59 time=1.075 ms
64 bytes from 104.36.251.215: icmp_seq=439 ttl=59 time=1.117 ms
64 bytes from 104.36.251.215: icmp_seq=440 ttl=59 time=1.101 ms
64 bytes from 104.36.251.215: icmp_seq=441 ttl=59 time=1.035 ms
64 bytes from 104.36.251.215: icmp_seq=442 ttl=59 time=1.038 ms
64 bytes from 104.36.251.215: icmp_seq=443 ttl=59 time=1.041 ms
64 bytes from 104.36.251.215: icmp_seq=444 ttl=59 time=0.960 ms

```

```

joneostebo — CLIENT — ping 104.36.251.213 — 65x22
64 bytes from 104.36.251.213: icmp_seq=375 ttl=59 time=1.181 ms
64 bytes from 104.36.251.213: icmp_seq=376 ttl=59 time=1.069 ms
64 bytes from 104.36.251.213: icmp_seq=377 ttl=59 time=1.051 ms
64 bytes from 104.36.251.213: icmp_seq=378 ttl=59 time=1.240 ms
64 bytes from 104.36.251.213: icmp_seq=379 ttl=59 time=1.459 ms
64 bytes from 104.36.251.213: icmp_seq=380 ttl=59 time=1.577 ms
64 bytes from 104.36.251.213: icmp_seq=381 ttl=59 time=1.215 ms
64 bytes from 104.36.251.213: icmp_seq=382 ttl=59 time=1.204 ms
64 bytes from 104.36.251.213: icmp_seq=383 ttl=59 time=1.309 ms
64 bytes from 104.36.251.213: icmp_seq=384 ttl=59 time=1.161 ms
64 bytes from 104.36.251.213: icmp_seq=385 ttl=59 time=1.115 ms
64 bytes from 104.36.251.213: icmp_seq=386 ttl=59 time=1.597 ms
64 bytes from 104.36.251.213: icmp_seq=387 ttl=59 time=1.469 ms
64 bytes from 104.36.251.213: icmp_seq=388 ttl=59 time=1.328 ms
64 bytes from 104.36.251.213: icmp_seq=389 ttl=59 time=1.294 ms
64 bytes from 104.36.251.213: icmp_seq=390 ttl=59 time=2.587 ms
64 bytes from 104.36.251.213: icmp_seq=391 ttl=59 time=1.259 ms
64 bytes from 104.36.251.213: icmp_seq=392 ttl=59 time=2.480 ms
64 bytes from 104.36.251.213: icmp_seq=393 ttl=59 time=3.026 ms
64 bytes from 104.36.251.213: icmp_seq=394 ttl=59 time=1.164 ms
64 bytes from 104.36.251.213: icmp_seq=395 ttl=59 time=1.293 ms

```

```

joneostebo — ssh admin@104.36.251.214 -p 2122 — 110x19

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* New product announcements
* Special events
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admin@104.36.251.214's password:

Last login: 2019-09-15 04:49:25 from 104.36.250.11
User "admin" has logged in 21 times in the past 30 days
ATM-Meetup-Core1# vsx update-software tftp://172.17.5.11/ArubaOS-CX_8325_10_03_0020.swi vrf mgmt

```

CX Switching Platforms

6300 1RU

6400 Chassis

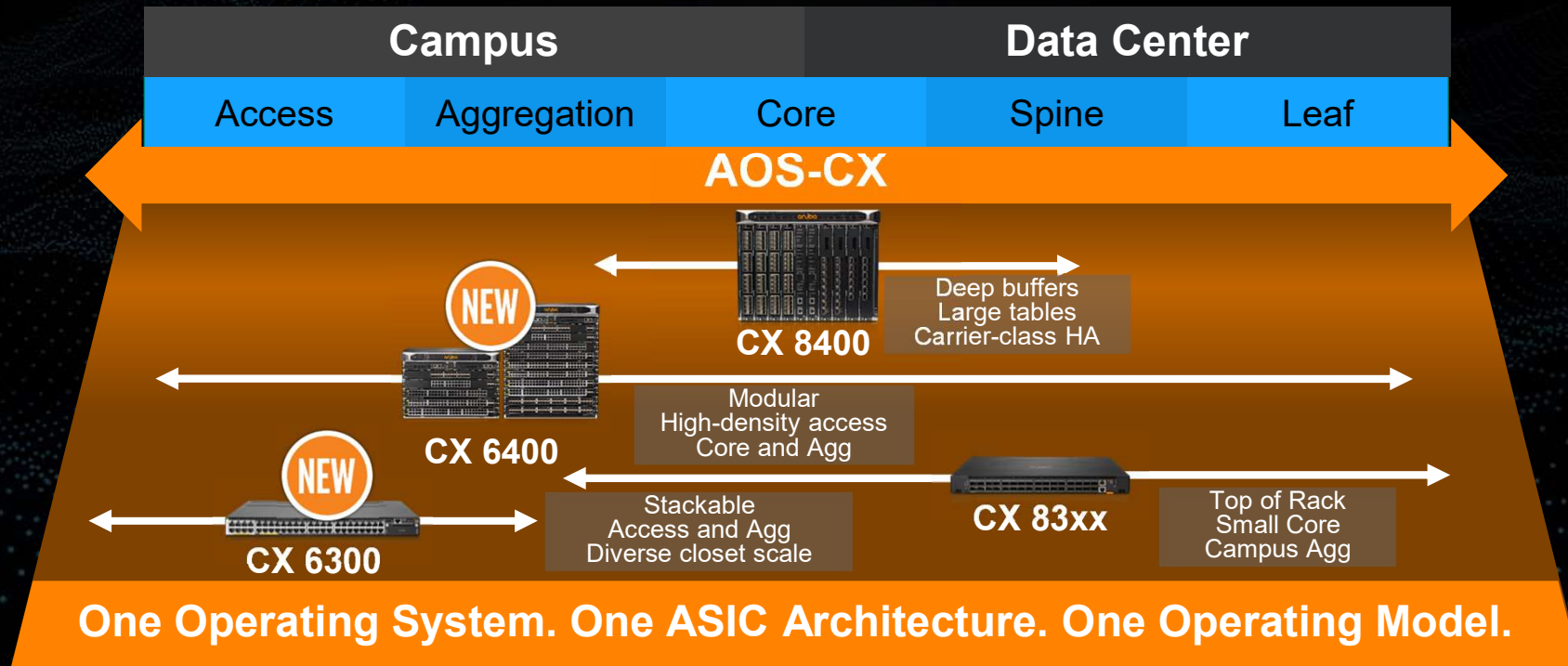
83xx Data Centre TOR/1RU

8400 Data Centre Chassis



ARUBA CX SWITCHING FOR THE ENTERPRISE

NEW PLATFORMS COMPLETE END-TO-END SWITCHING PORTFOLIO



New Switching Platform – 6300

Performance, scale, and high availability

Aruba 6300 Series

- 7 modular power switches
- 4 fixed switches
- 1 ASICs
- 1 operating model



880 Gbps
Switching
Capacity

Up To 2880W
60W of PoE on all
Interfaces

NEW ASIC's
Access ASIC's

Future ready: 1G to 50G uplinks for scale and investment protection

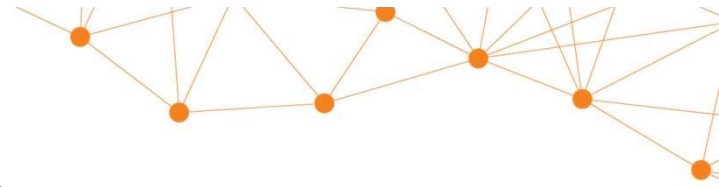
Flexible growth: 10 Member VSF stacking for ease of management

Built for Wi-Fi 6: Smart Rate on all ports and 60W always-on POE

Real-time insights: Embedded analytics from NAE for rapid troubleshooting

CX6300 Switches





New Switching Platform – 6400

Performance, scale, and high availability in flexible form factors

Aruba 6400 Series

- 5 access line cards
- 3 core/agg line cards
- 2 chassis options
- 1 operating model



Flexibility and scale:
From 1G PoE access to 100G core

Data center class performance:
Data center class non-blocking, distributed architecture and no oversubscription

Built for Wi-Fi 6: Up to 480 ports of Smart Rate and 60W always-on PoE

High availability: Live Upgrades with VSX, redundant hot swappable power and fans

Real-time insights: Embedded analytics from NAE for rapid troubleshooting

Up To 24Tbps
Switching Capacity

Up To 13Bpps
Switching Throughput

NEW ASIC's
Core and Access ASIC's

Aruba 6400 Switch Hardware Overview

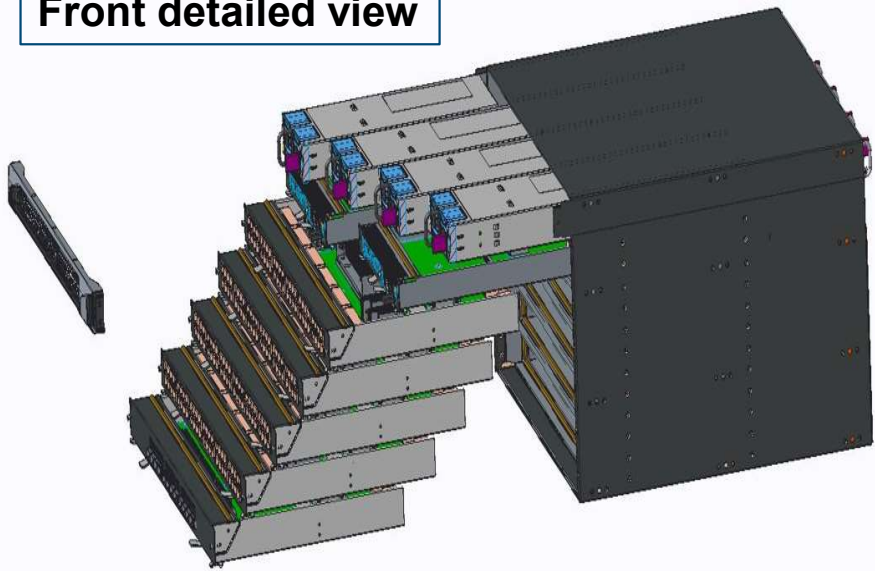
The backplane on every chassis is passive which brings the following benefits:

- Lower power consumption
- Fan-Tray, Power supplies and Line cards are field replaceable units (FRU) and they can be replaced non-disruptively

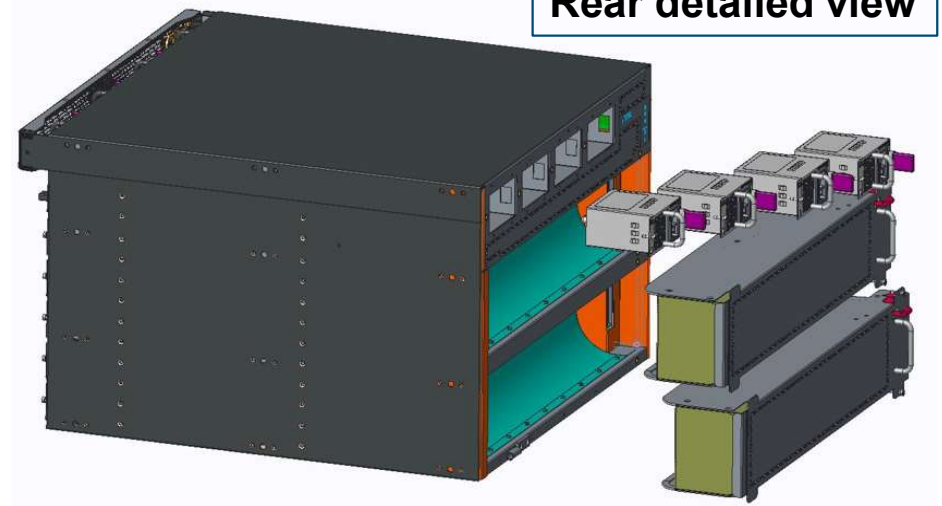


Aruba 6405 Chassis

Front detailed view



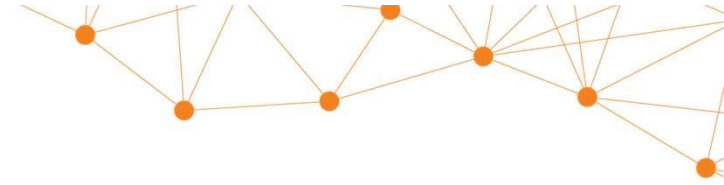
Rear detailed view



CX6400 Switches

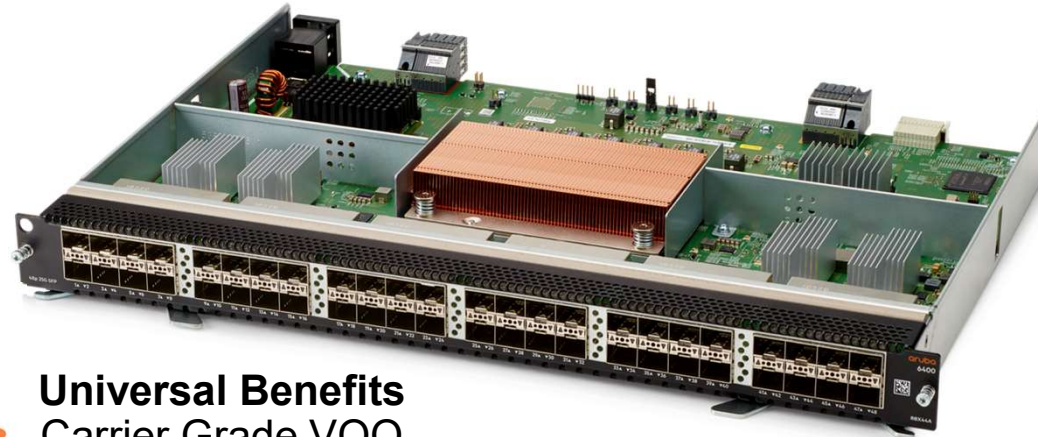


Aruba's Next Generation ASIC

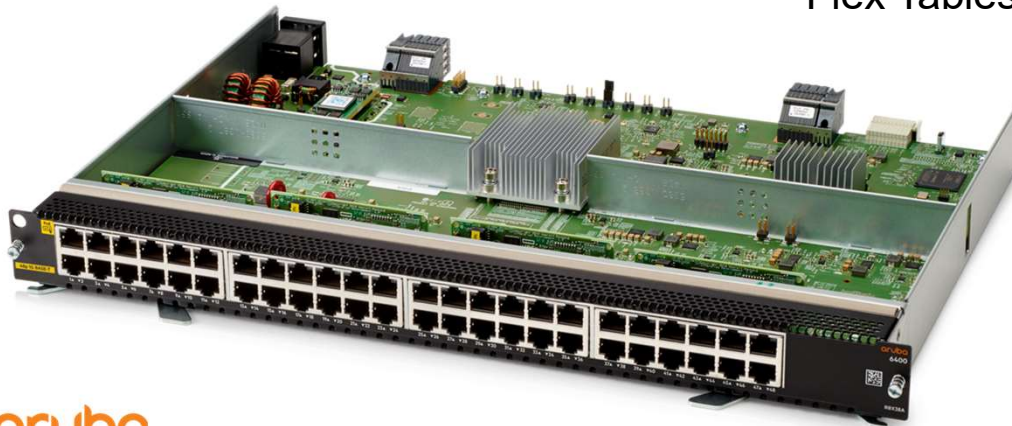


Aruba Core ASIC

- 2.4Tbps
- 1.39Bpps
- 32MB Buffer



Universal Benefits
Carrier Grade VOQ
Flex Pipelines
Flex Tables

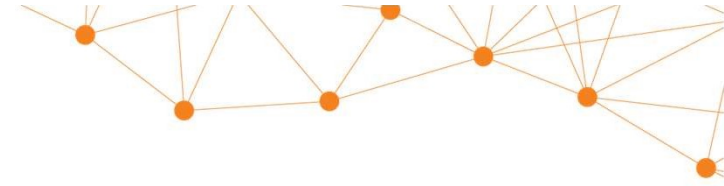


Aruba Access ASIC

- 880Gbps
- 660Mpps
- 8MB Buffer

Aruba 8300 Series

Performance, scale, and high availability



Aruba 8320 Series

- 3 Fixed Switches
- 1 ASICs
- 1 Operating System



2.5 Tbps
Switching
Capacity

Flexible Positioning: Campus
Aggregation/Core or Data Center
Leaf/Access

Highly Redundant: N+1 redundant hot
swappable power supplies, fans

Real-time insights: Embedded
analytics from NAE for rapid
troubleshooting

Aruba 8325 Series

- 2 Fixed Switches
- 1 ASICs
- 1 Operating Model



6.4Tbps
Switching
Capacity

High Density, Visibility, Analytics

Modernizing Campus and Datacenter

Aruba 8400



**Up To
19.2Tbps**
Switching
Capacity

Up To 7.1Bpps
Switching
Throughput

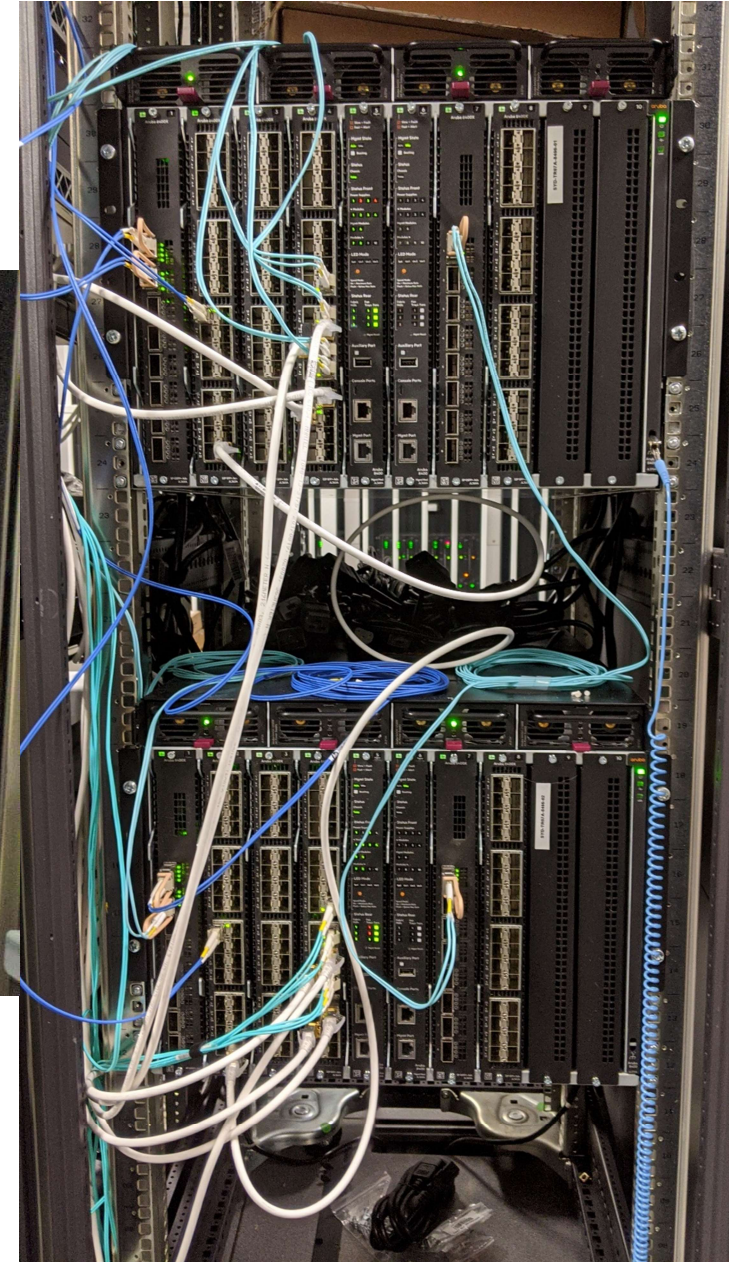
Large buffers
Flexible options
1.5G or 4G
buffers

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- Carrier Grade performance:** Data center class non-blocking, distributed architecture and no oversubscription
- High availability:** Live Upgrades with VSX, redundant hot swappable power and fans
- Real-time insights:** Embedded analytics from NAE for rapid troubleshooting

CX8400 Switches



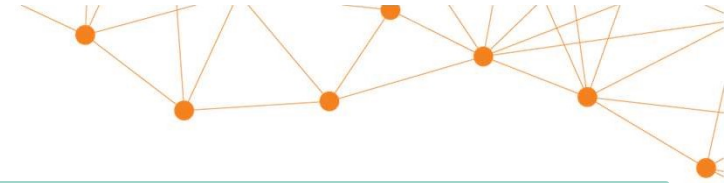
One CX Warranty

All CX switches have the same warranty
84xx/83xx/64xx/63xx

	ProCurve/AOS-S	All CX from 1-Nov-19
Term	Lifetime	5years after EoS
RMA	NBD Ship	NBD Ship
SW updates	Included	Included
SW support	5 years after EoS	1/3* years after EoS
TAC support	8x5 included 24x7 – 90 days	8x5 90 days

* 1 year updates, 3 year vulnerabilities

Carepack Services for Aruba



Foundation Care for Aruba						A-La-Carte ³		
Industry Support Level	NBD	NBD ONSITE	4hr	4HR ONSITE	6-HR			
Entitlement	NBD Exchange	NBD	4hr Exchange	24x7	CTR [*]	24x7 Technical Support (for switches)	24x7 TAC (for Software)	Hardware Only
24x7 TAC Phone Support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Software Updates/Upgrades	Yes	Yes	Yes	Yes	Yes	-	Yes	-
Hardware Replacement	NBD delivery of parts only	NBD parts + onsite labor	4 HR delivery of parts only	4 HR parts + onsite labor	6 HR parts + onistie labor	-	-	Yes
Aruba Support Portal/ Knowledge Base Access	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

NBD = Next Business Day
 CTR = Call To Repair
 * 6HR response for critical outages only

¹Requires an active Foundation Care support contract to qualify and requires an scoping statement-of-work.

² Applies to Severity 1 issues only.

³ Not available for all products, please see details for availability. TAC and Software are generally provided under the subscription license.

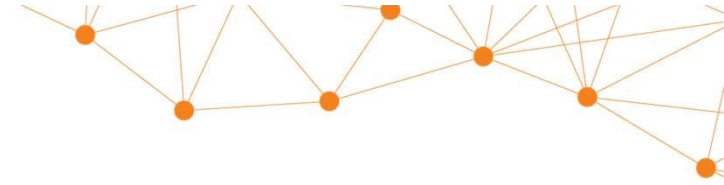
Delivering Value

With NAE, NetEdit and More



Network Analytics Engine

Modern Resiliency and Programmability



Advanced Visibility

On-box, time series database
for event and correlation history

Real-time access to
network insights



Faster Detection, and Diagnostics

Rules-based, real-time
monitoring and notifications

Intelligent notifications
with automatic correlation to
config changes



Automation and Integration

Business policy-based
automation to simplify
network functions

Easily programmable with
modern tools and languages
(e.g. Python)

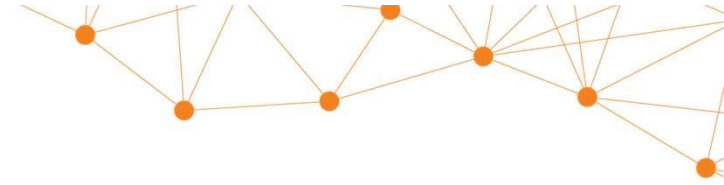


Improved Network Assurance

Carrier-grade reliability to
support growing traffic demands

Eliminate bottlenecks with multi-
terabit performance and high
speed, high port density

Monitoring & Troubleshooting Made Easy



Wide Monitoring Capabilities

Configuration • Protocol and System State
ASIC Counters • ACL's

Real Time Network Visibility

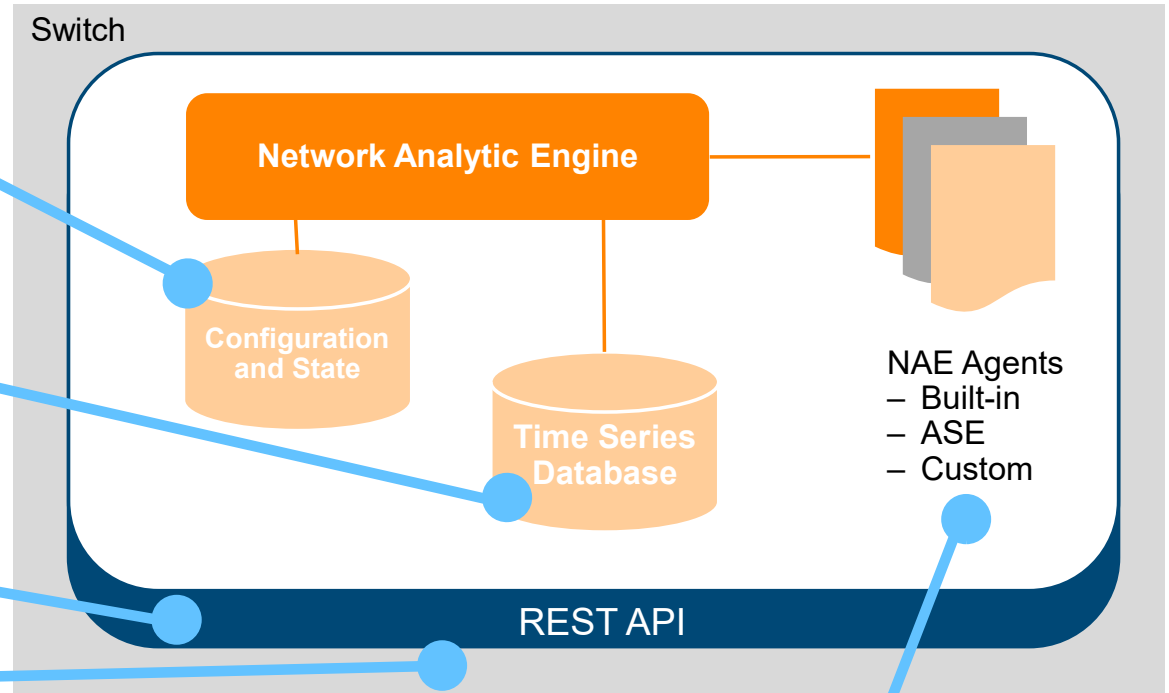
Synchronization every 5 seconds
Realistic model of network behavior

Intelligence and Automation

Full power of Python
Parameters for customization
Variables for persistent policy state

Sandbox Isolation

Low system overhead



Simple: Programmability for Network Operations...Driving Predictability

Flexible Actions

Alert Level
CLI command execution
CLI command output capture
Configuration checkpoint diff capture
Syslog generation
Script function callback

ANALYTICS AND AUTOMATION POWERED NETWORK OPERATIONS

AUTOMATED CONFIG MANAGEMENT WITH ARUBA NETEDIT

Search

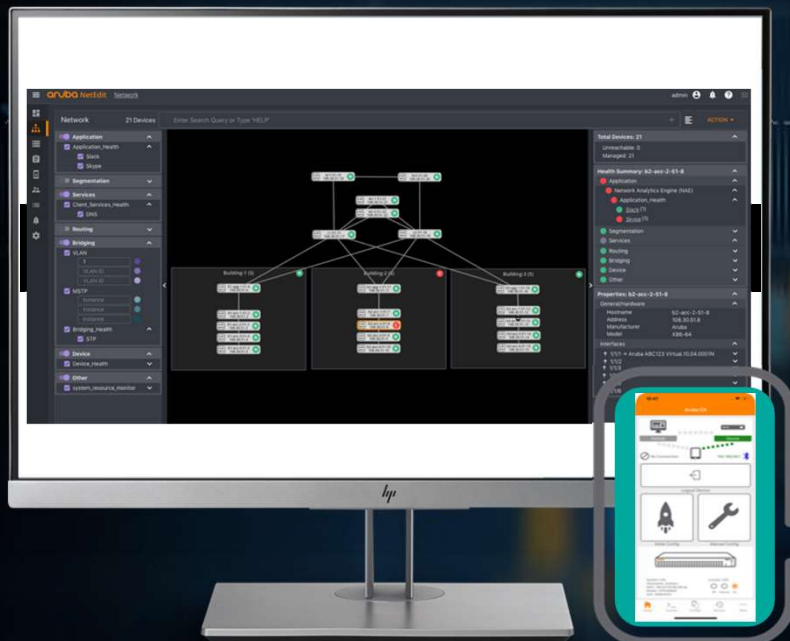
Edit

Validate

Deploy

Audit

Troubleshoot



CX Mobile App

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Enterprise company

Management Simplicity

Topology for fast view into network health, including devices with config issues

GUI-driven solution configs to implement common configurations easily across multiple systems

Auto-Change Verification to minimize change windows and reduce errors
Continuous Validation to monitor for deviations from intended policy or design

One Touch Deployment with Aruba CX Mobile App

Accelerate day zero config, view and manage using your mobile device

Visibility and Analytics via NAE

Embedded analytics with real-time health status and diagnostics for efficient root cause analysis

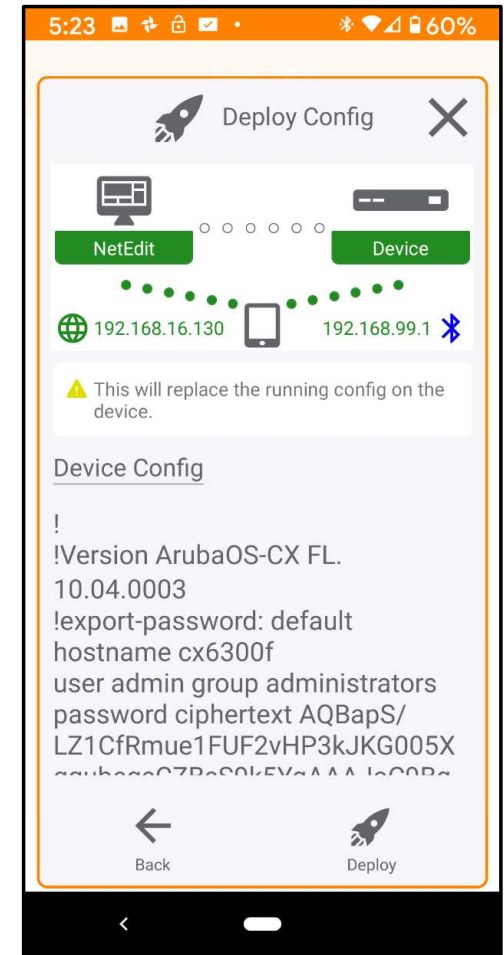
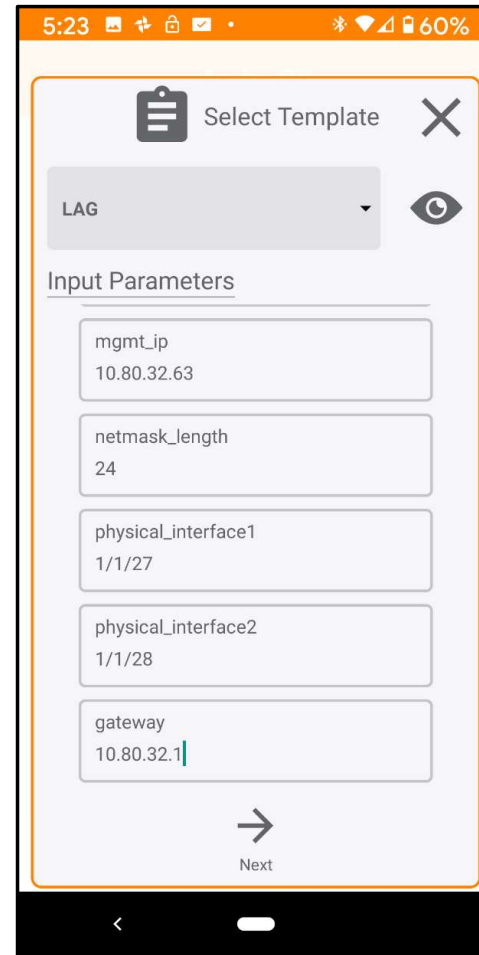
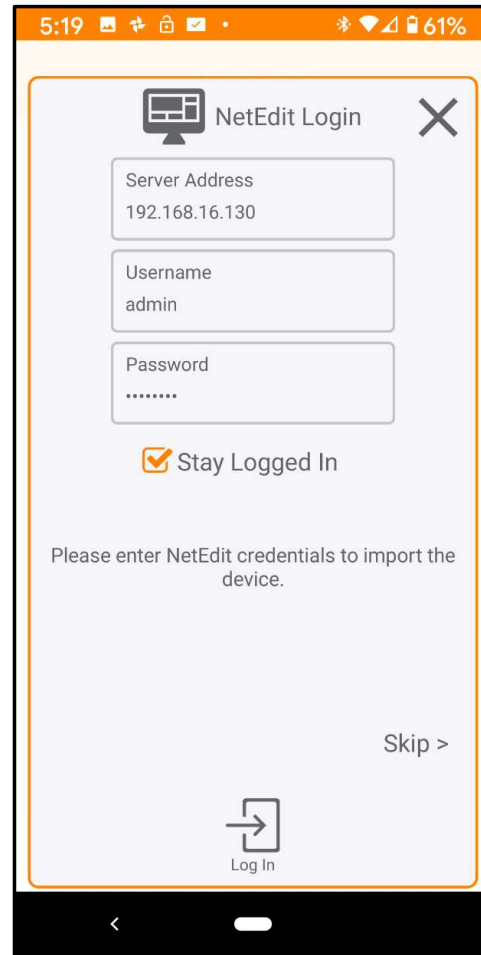
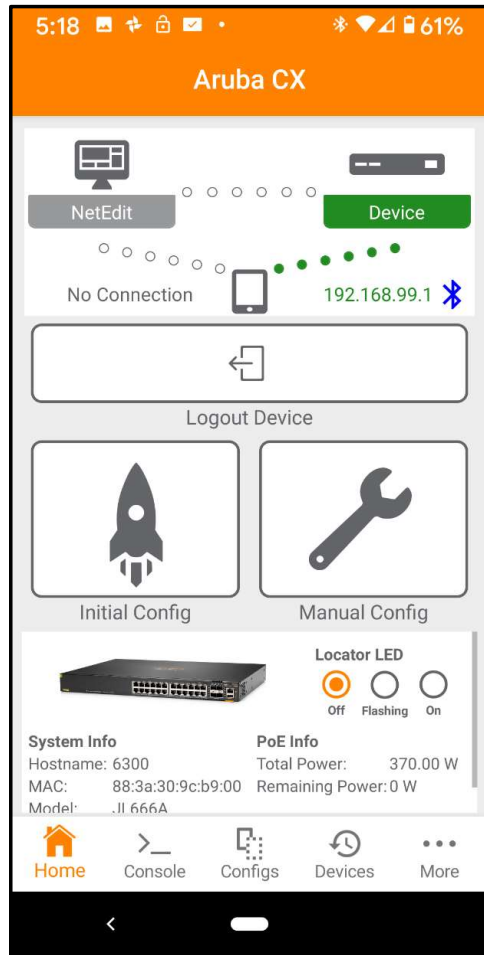
Health reports on devices, apps, and network services

Script tags indicate what layer is contributing to issues, speeding root cause analysis

Workflow Integration with 3rd Party Tools

Immediate notifications from Slack, TOPdesk, ServiceNow, etc.

Aruba CX mobile App – easy switch deployment



ARUBA CX SWITCHING

NEXT-GEN, CLOUD-NATIVE SWITCHING DESIGNED FOR THE NETWORK OPERATOR



Automated Operations

Cloud Native
Operating System



Actionable Insights

Distributed Analytics
Embedded in every Switch



One Operating Model

Edge Access to
Data Center

Q&A





Thank You

