George Isaac
Product Manager & HPE Aruba Network Ambassador

Over Ten Years of experience in Network Presales, Consulting, Design, Proof of concepts and troubleshooting.

Expertise on NAC , Micro segmentation , SOC integrations , UEBA , location-based services. Open standards Networking Evangelist - APIs and Automation

Certified in ACDX , ACCX , MASE , ACCP , ACMP , CWNA , ECSE

Networking Challenges at the Edge

➤ Deploying Zero trust network access and leverage DPI to control application access

➤ Borderless Network – Network follows the users and seamless application access

➤ Common policy when connected over wired & Wireless environment

➤ Application aware infrastructure and prioritize business critical applications

➤ Automation (Day 0 / Day N automation) & orchestration (one network one policy)

➤ Adaptability with IOT devices

➤ Proactive network troubleshooting and monitor end user-experience

Aruba Switching Leadership

Customer First, Customer Last

Henkel · WESTIN HOTELS & RESORTS · CITY OF LONDON · FRESNO PACIFIC UNIVERSITY · U.S. ARMY · AXIS COMMUNICATIONS · verizon · Telefónica · TAHOE FOREST HEALTH SYSTEM · DreamWorks Animation SKG · TEXAS RANGERS · VERA WANG · KAISER PERMANENTE · NCC · Columbia Sportswear Company · GROVE CITY COLLEGE · Deloitte · TRAVELERS · Tillamook · UNITED · Seattle Children's Hospital + Research + Foundation · GOLDEN STATE WARRIORS · PENSKE · FRÁVEGA · IU · THE HOME DEPOT · WB · Gatwick LONDON AIRPORT

100K+ Customers Worldwide

Innovation	Recognition	Scale
7th Gen ASICs		
1000+ Patents	**Gartner**	
30+ Years Experience	**10+ years** a Leader in LAN Magic Quadrants[1]	Leader in **5 out of 6** *Critical Capabilities*

THE CHANNEL CO. CRN TECH INNOVATORS

THE CHANNEL CO. CRN Products of the YEAR

Scale
#2 Market Share · **$1.5B+** Annual Revenue · **1B+** Ports Shipped

Aruba CX Switching
Design, deploy, monitor and analyze with ease

Automated Operations
Intelligent and Flawless Configs with Aruba NetEdit

Actionable Insights
Distributed Analytics Embedded in every Switch

Secure Segmentation
Automated and Unified Dynamic Segmentation for IoT and Users

Simplicity from edge access to data center
Single operating model with cloud-native AOS-CX and no switch software licensing or subscription costs

Hardware Innovations

Hardware Matters Aruba Gen7 ASIC

Faster Innovation

Tight integration between hardware and software gets new capabilities to market faster

30+
Years of IP

Non-Blocking Performance

High-performance VOQ capability prevents head-of-line blocking, optimizing use of all ports
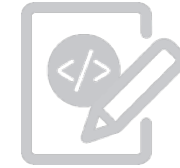
Flexible Programmability

Dynamic programming of network resources for use case optimization

7th
Generation Architecture

25 Years of Switching ASIC Heritage

| 1st Generation 1.7M Transistor 31.25 MHz 1996 | 2nd Generation 36M Transistors 118 MHz 1998 | 3rd Generation 180M Transistors 125 MHz 2000-2003 | 4th Generation 270M Transistors 343 MHz 2004-2005 | 5th Generation 523M Transistors 625 MHz 2006-2012 | 6th Generation 1.8 Billion Transistors 563 MHz 2012-2016 | 7th Generation 12.3 Billion Transistors 960 MHz 2019 |

2000 Series

4000 Series

4200 Series

5300 Series

5400 Series

3500 Series

6000 Series

8200 Series

5400zlV2/8200

2910 Series

Aruba 5400R

Aruba 3810

Aruba 2930

Aruba 2920

Aruba CX 6400

Aruba CX 6300

Aruba CX 6200

Cloud-Native Operating System

AOS-CX
Built on cloud-native principles

Modularity

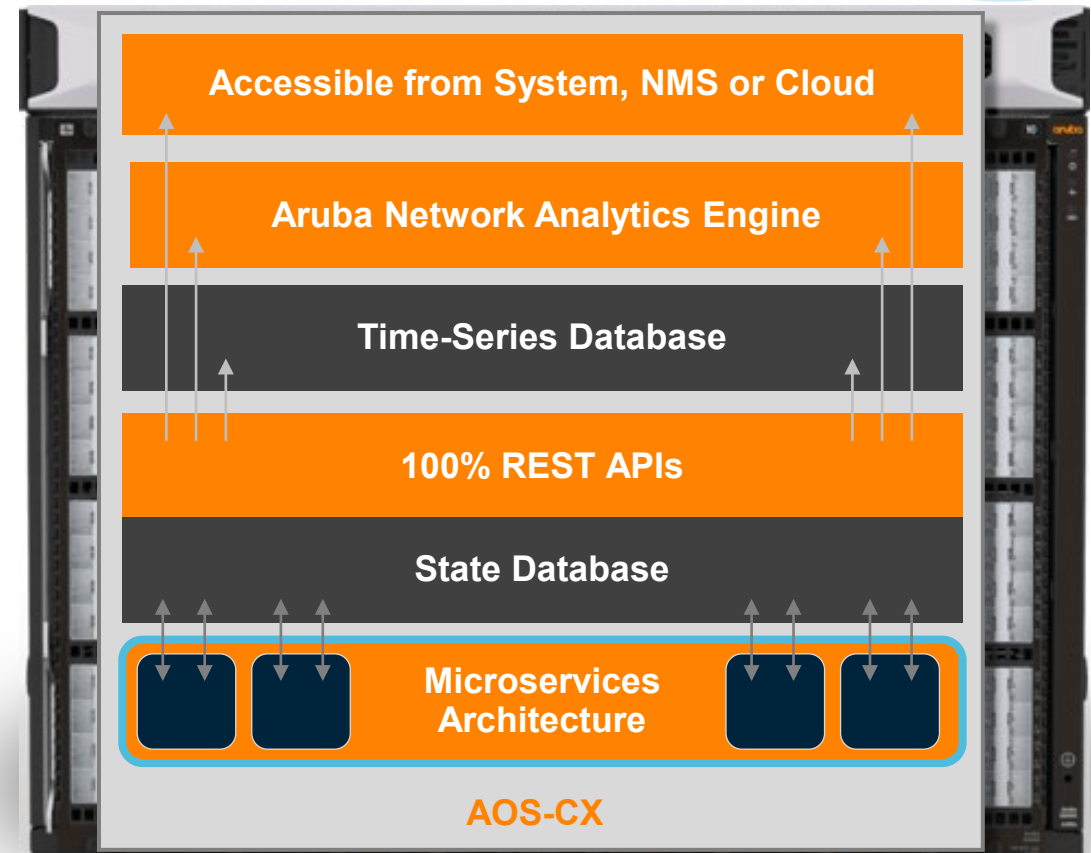Faster innovation with independent processes

Programmability

Simplified operations through automation

Resiliency

Stable and reliable microservices design

Elasticity

One operating model from edge access to data center

Accessible from System, NMS or Cloud

Aruba Network Analytics Engine

Time-Series Database

100% REST APIs

State Database

Microservices Architecture

AOS-CX

Gartner

Source: Gartner - Top Emerging Trends in Cloud Native Infrastructure (May'19)

Resiliency Enables Always-on Availability

Aruba VSX Live Upgrades

Orchestrated upgrades

Delivers on the promise of ISSU

No maintenance windows mandated

Gradual and planned traffic re-balancing

Dual Control-Plane equals
Software Redundancy
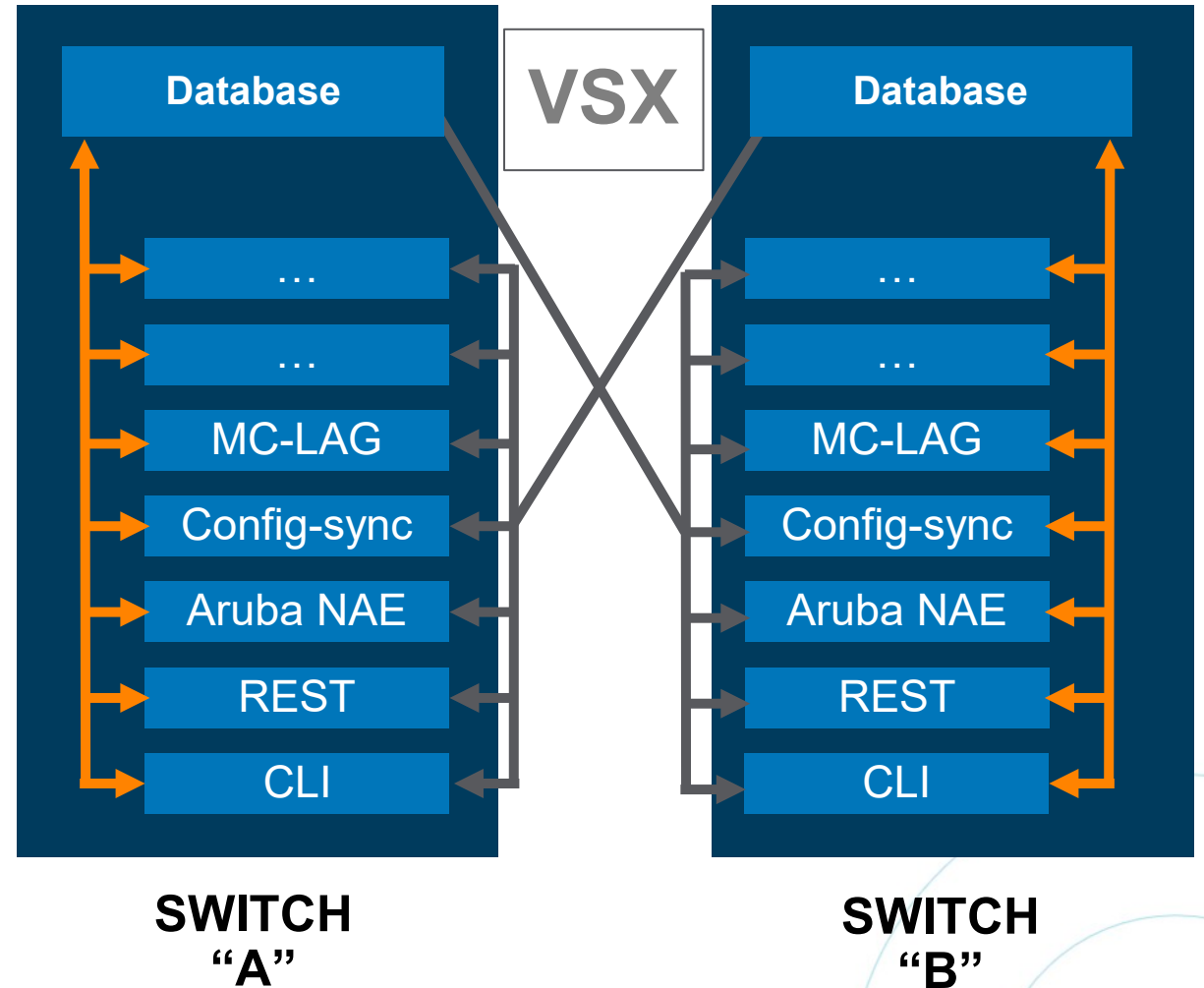
SWITCH "A"

SWITCH "B"

Aruba Virtual Switching Framework (VSF)

Front plane stacking

Simplified Management with virtual switch stack

Grow your network quickly

Go further with stacking across campus and site using long range transceivers

Fast stack config with Aruba CX Mobile App that auto-detects potential stack members and stack links makes it go from independent switches to a virtualized stack with just a few taps

CX 6300

10 unit CX 6300 stack

Flexibility to combine 6300M and 6300F models

Uses high speed 1/10/25/50GbE uplinks

CX 6200

8 unit CX 6200 stack

Uses 1/10GbE uplinks
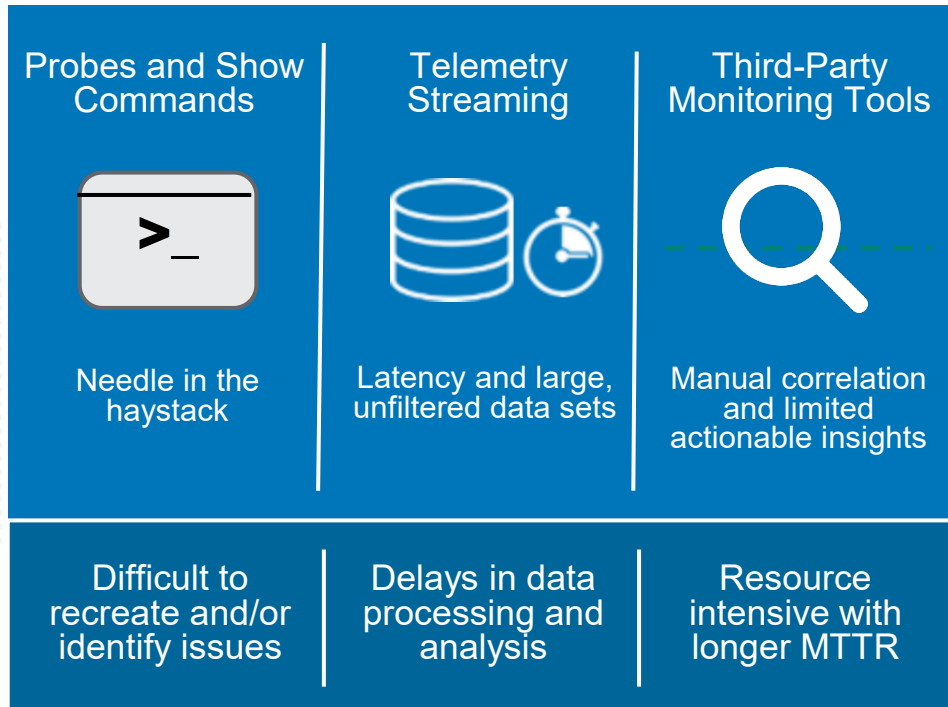
(6200 and 6300 mixed stack not allowed)

Distributed Analytics and Automation
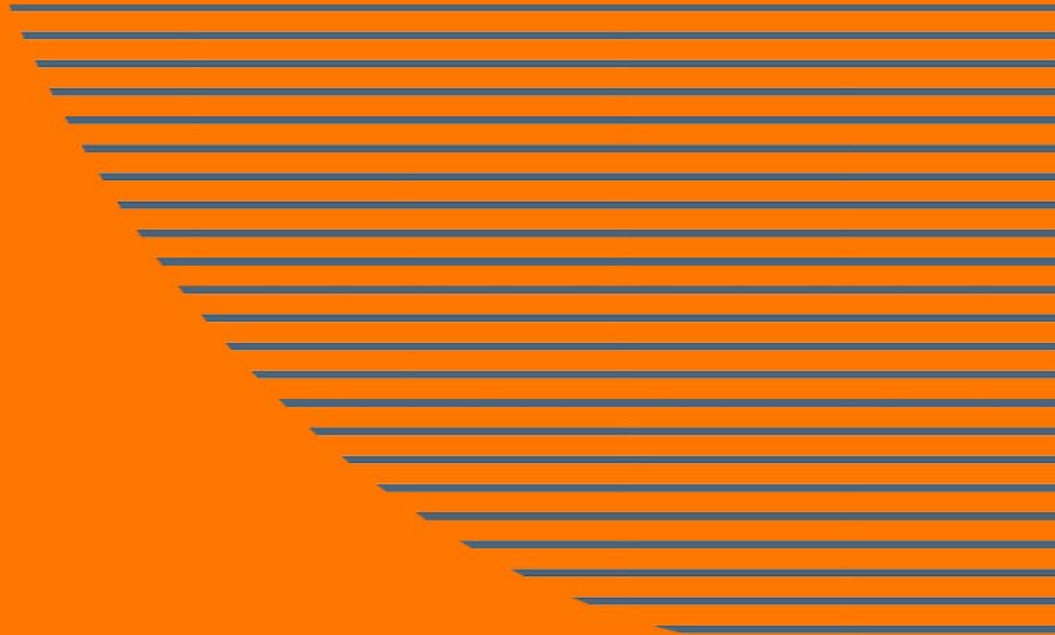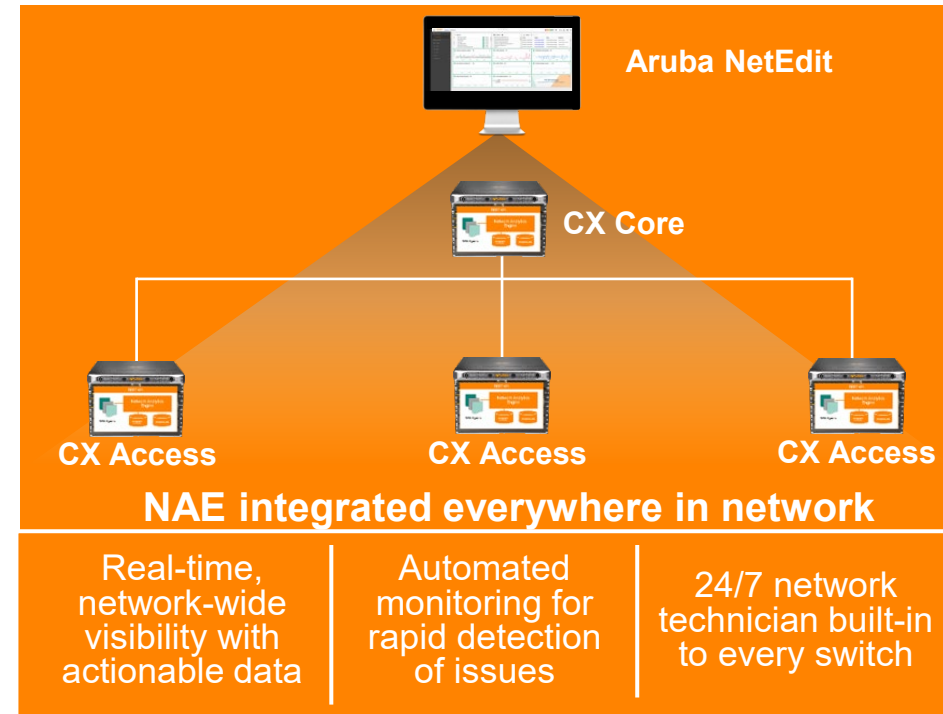
Turning Network Telemetry into Actionable Insights

Intelligent pre-processing with Aruba Network Analytics Engine
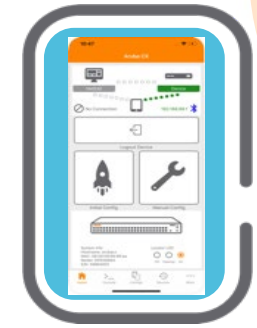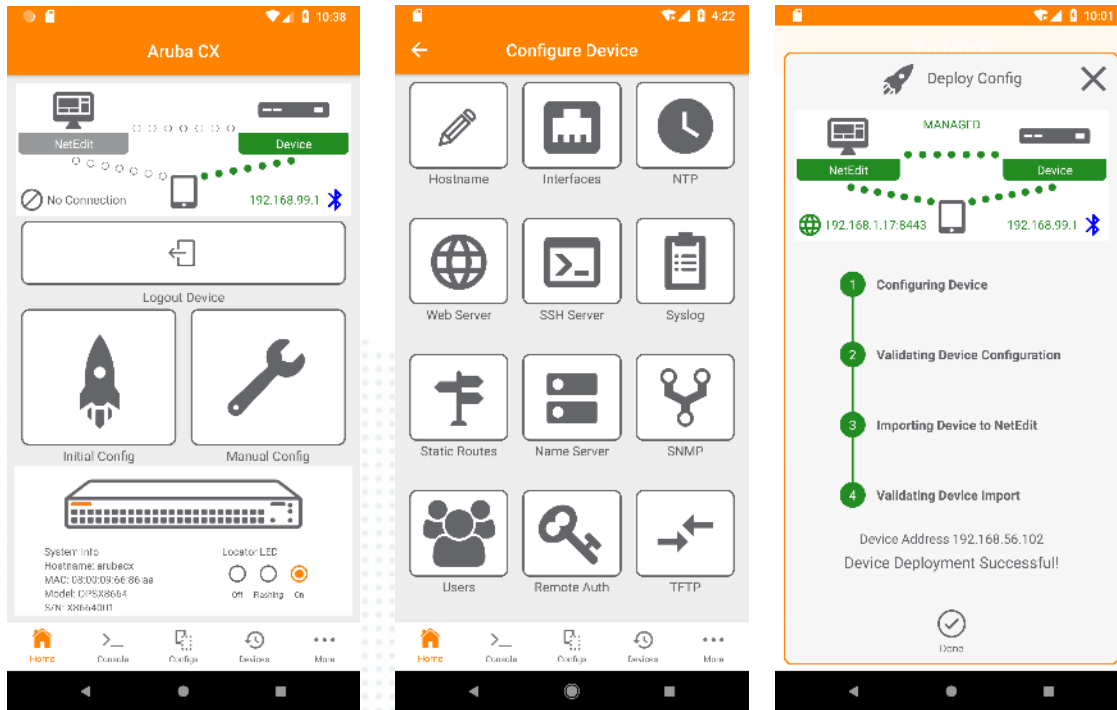
Legacy Approaches

Probes and Show Commands	Telemetry Streaming	Third-Party Monitoring Tools
Needle in the haystack	Latency and large, unfiltered data sets	Manual correlation and limited actionable insights
Difficult to recreate and/or identify issues	Delays in data processing and analysis	Resource intensive with longer MTTR

vs

Aruba CX Approach

Aruba NetEdit

CX Core

CX Access   CX Access   CX Access

NAE integrated everywhere in network

Real-time, network-wide visibility with actionable data	Automated monitoring for rapid detection of issues	24/7 network technician built-in to every switch

Simplified Install and Configuration
Aruba CX Mobile App

Aruba CX Mobile App


Visibility and convenience for today's IT

- **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
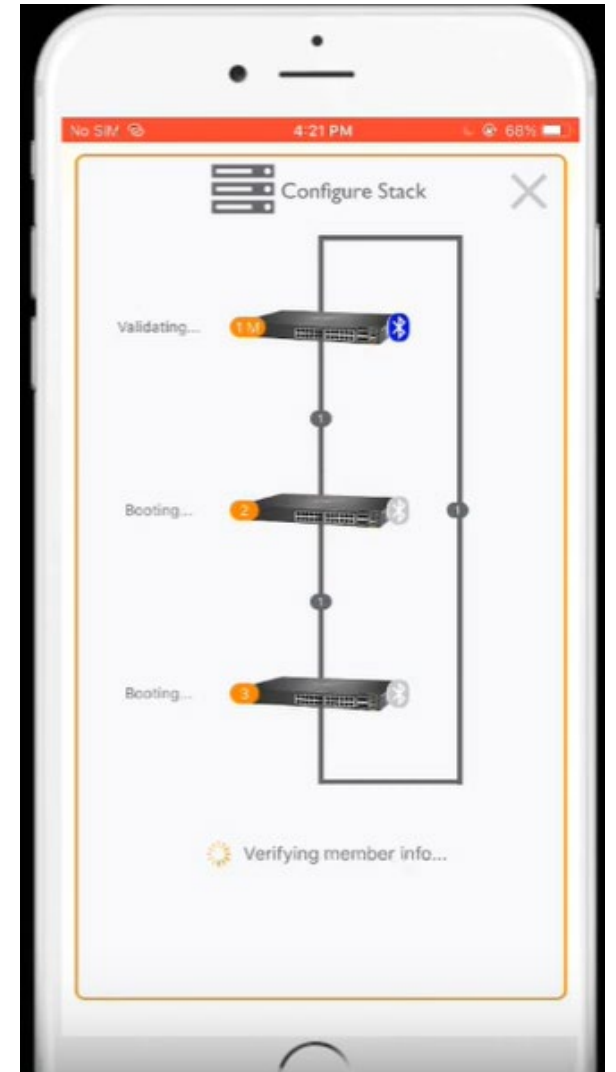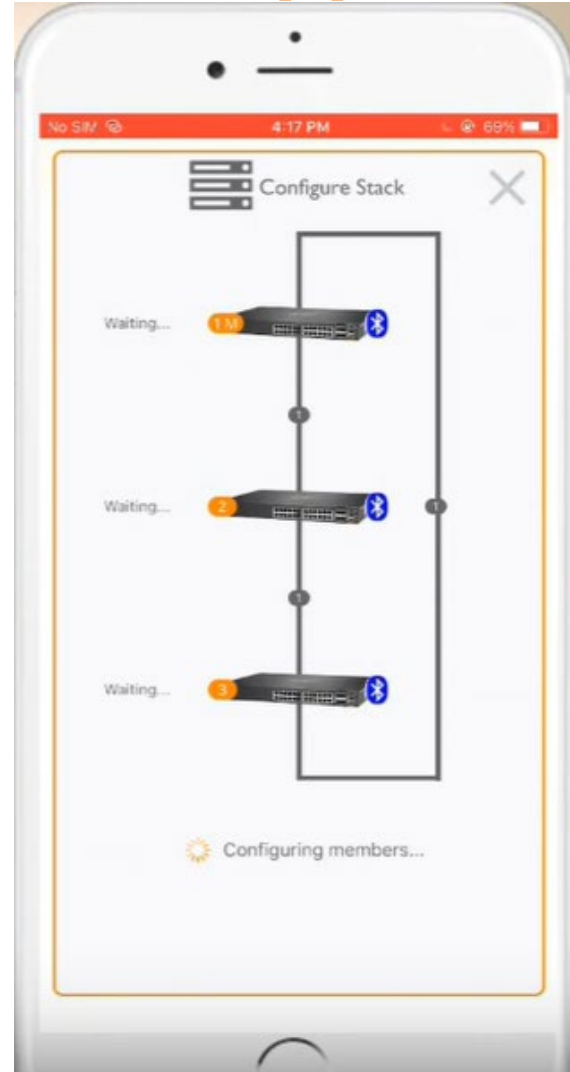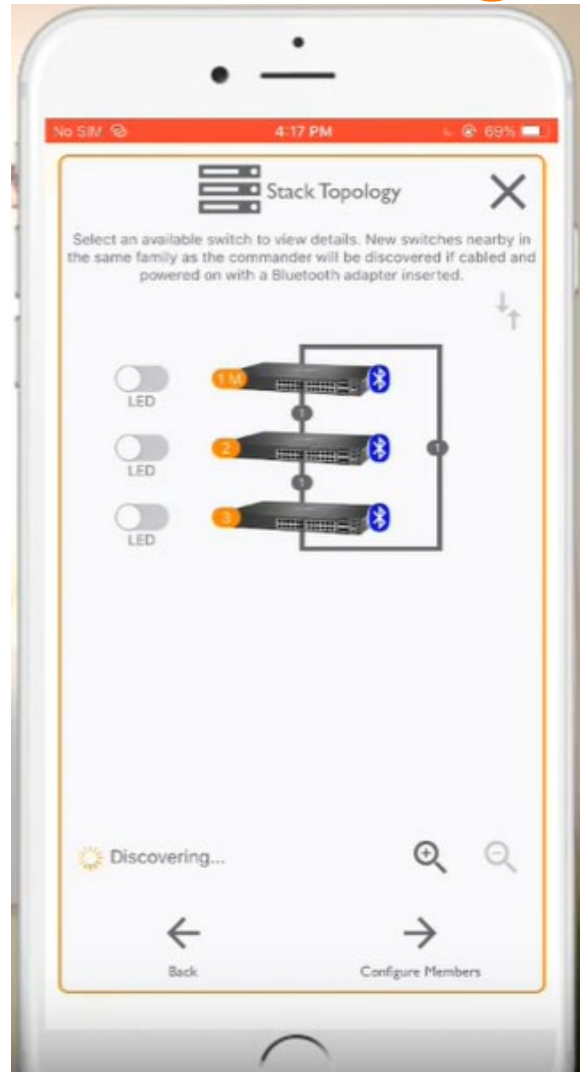- **Connectivity via Bluetooth or Wi-Fi** makes setting up switches quick and easy

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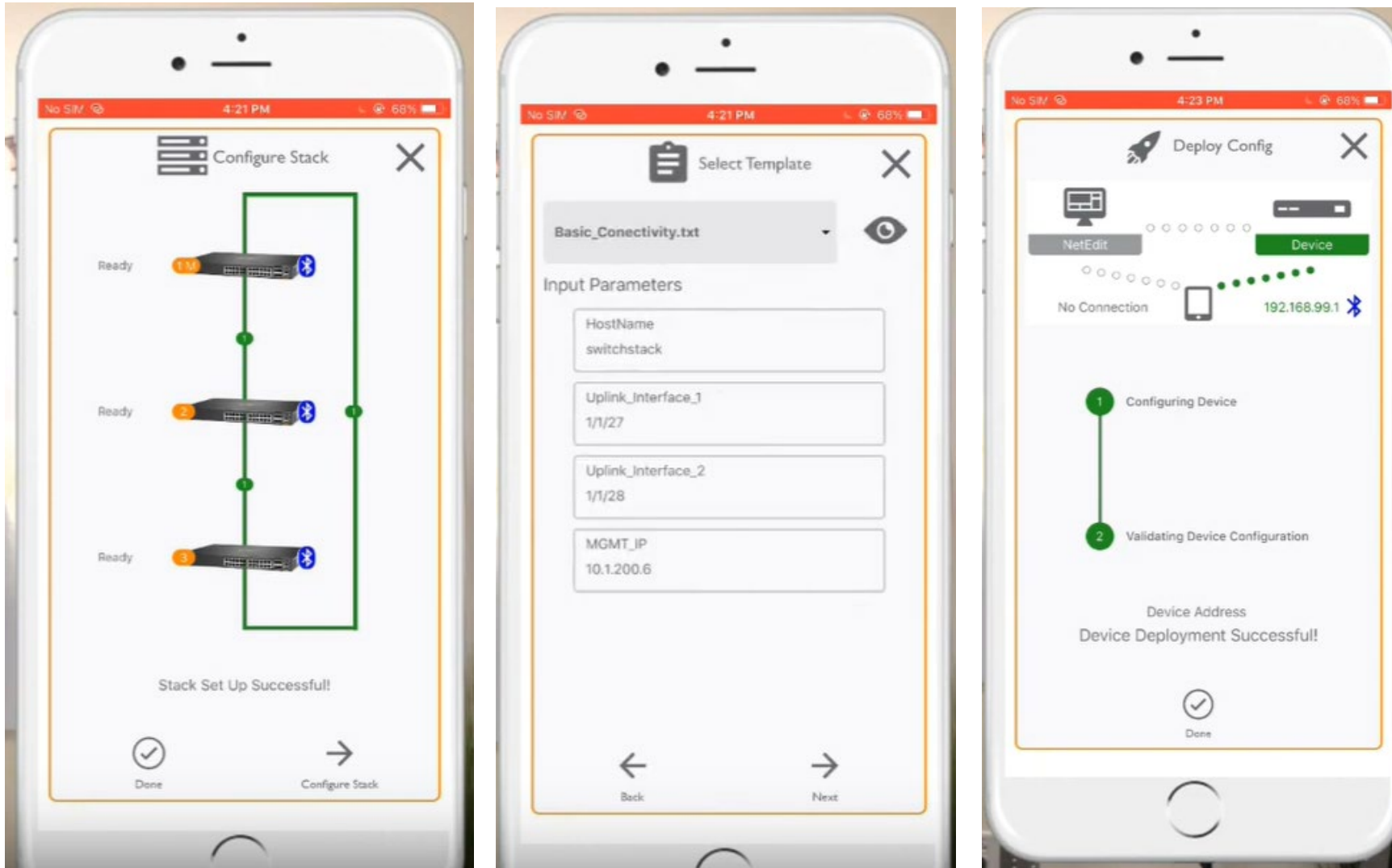
Day-O-Automation using Mobile application
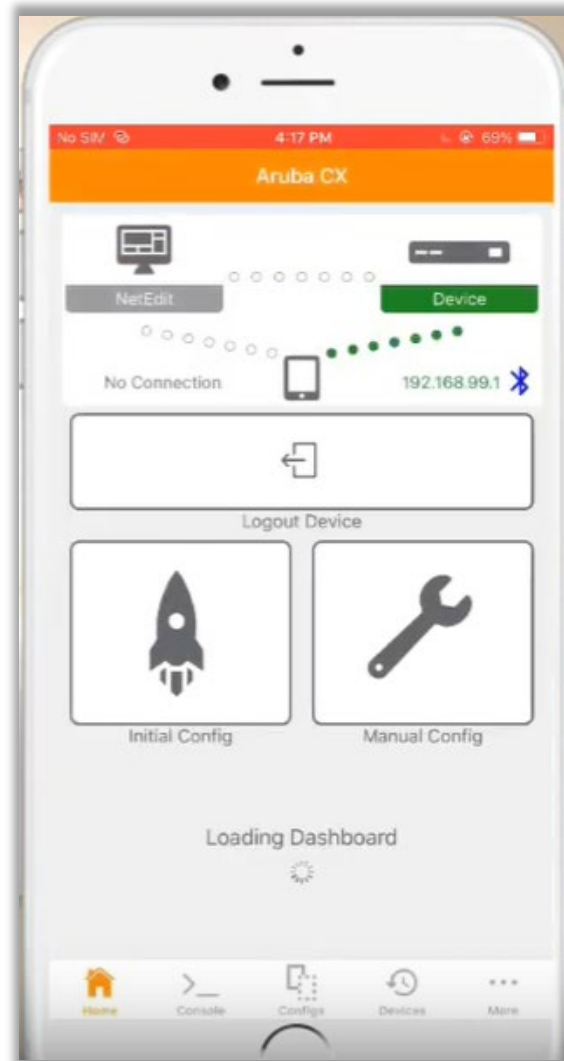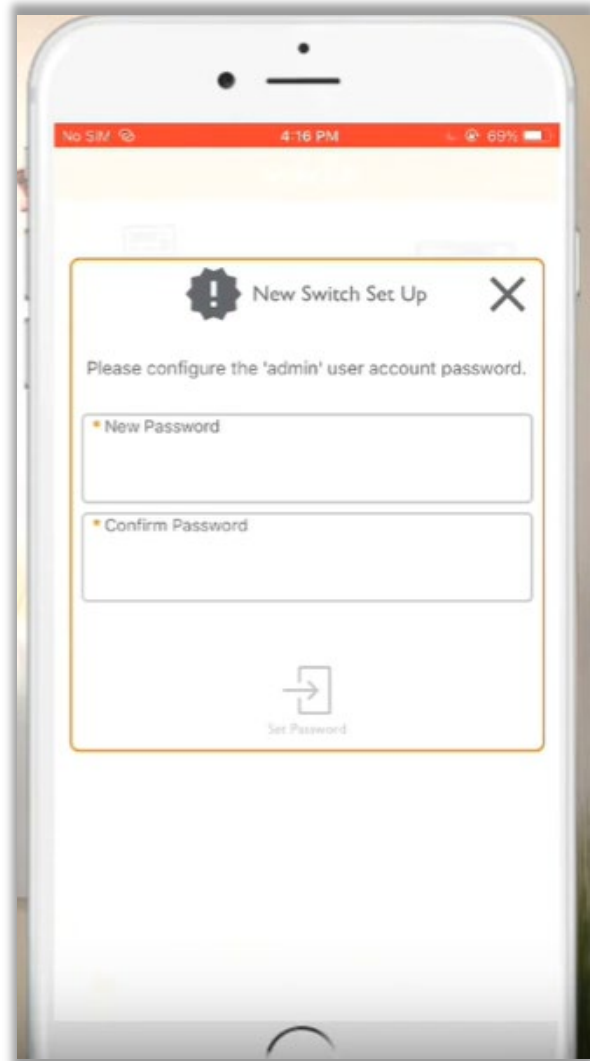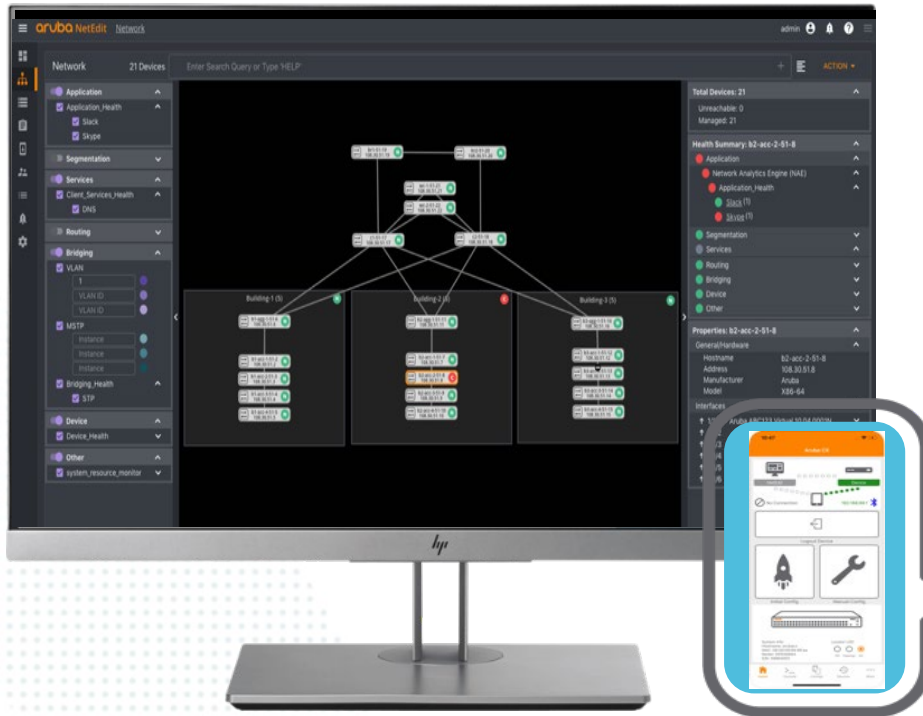
Day-O-Automation using Mobile application

Day-O-Automation using Mobile application

Analytics and Automation Powered Network Operations

Automated config management with Aruba NetEdit

Search

Edit

Validate

Deploy

Audit

Troubleshoot

Aruba CX Mobile App

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.

Simplifying the Operator Experience
From Day 0 through Day 2 operations

Install a new switch using mobile app and connect to management

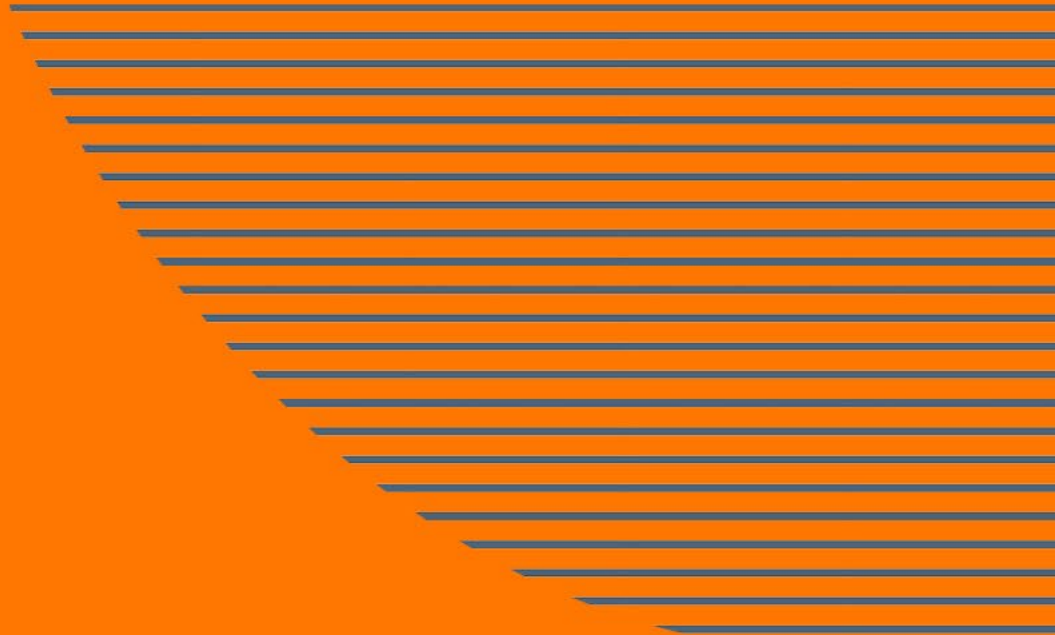New switch and its config are **automatically** imported

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

Aruba Central

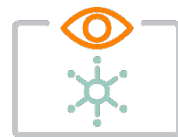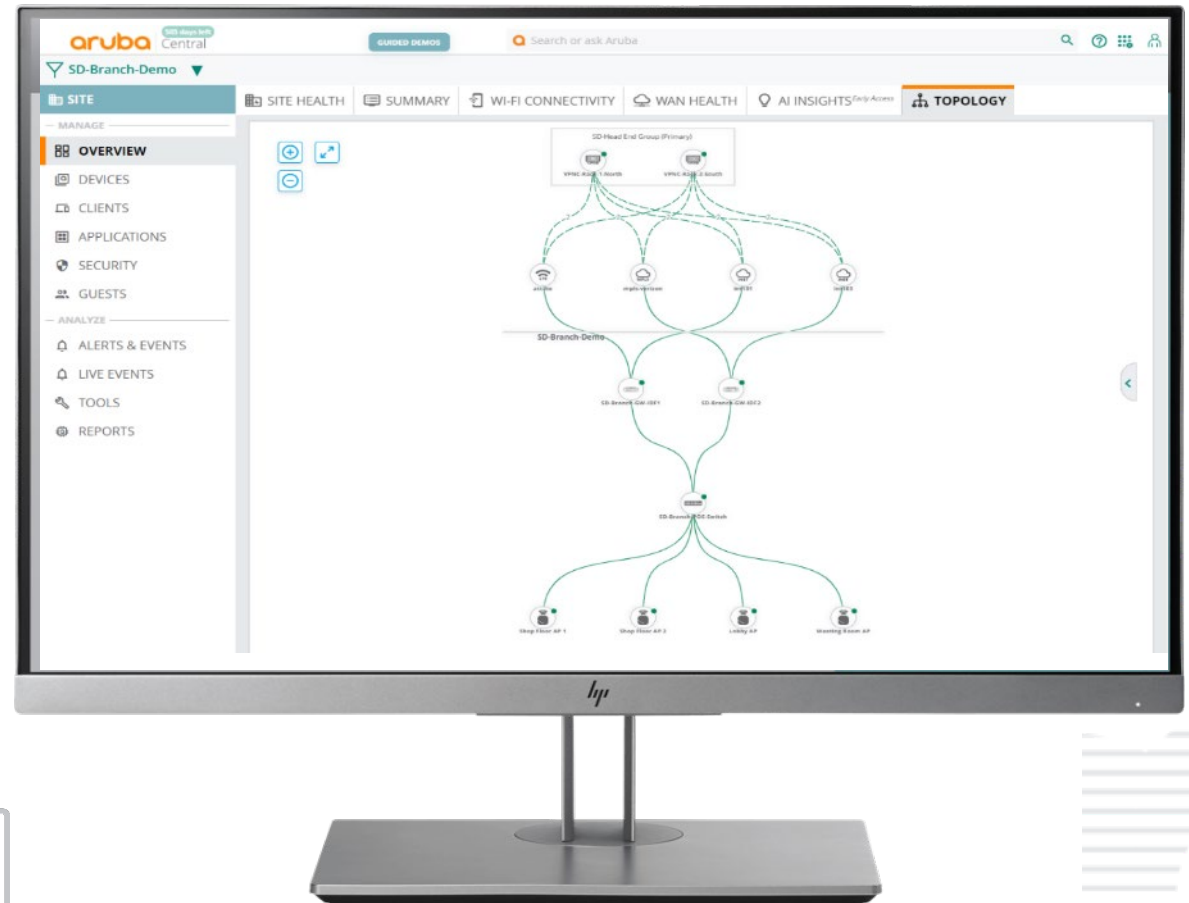Cloud-native, single pane of glass management for wired networks

Simplify Daily Operations with a Unified Infrastructure

Aruba Central

Cloud-native single-pane-of-glass console

Single architecture across campus, branch and data center

Monitor and manage wired, wireless and SD-WAN; campus, branch, remote worker and data center

UNIFIED INFRASTRUCTURE

AIOps Helps IT Continuously Optimize Performance
Combines user- and network-centric data with AI and ML

KEY COMPONENTS

AI SEARCH
Simple and easy to use

Based on natural language processing

AI INSIGHTS
Connectivity and performance SLAs

Baselining and anomaly detection

Network optimization and config recommendations

AI ASSIST
Event-driven monitoring and troubleshooting
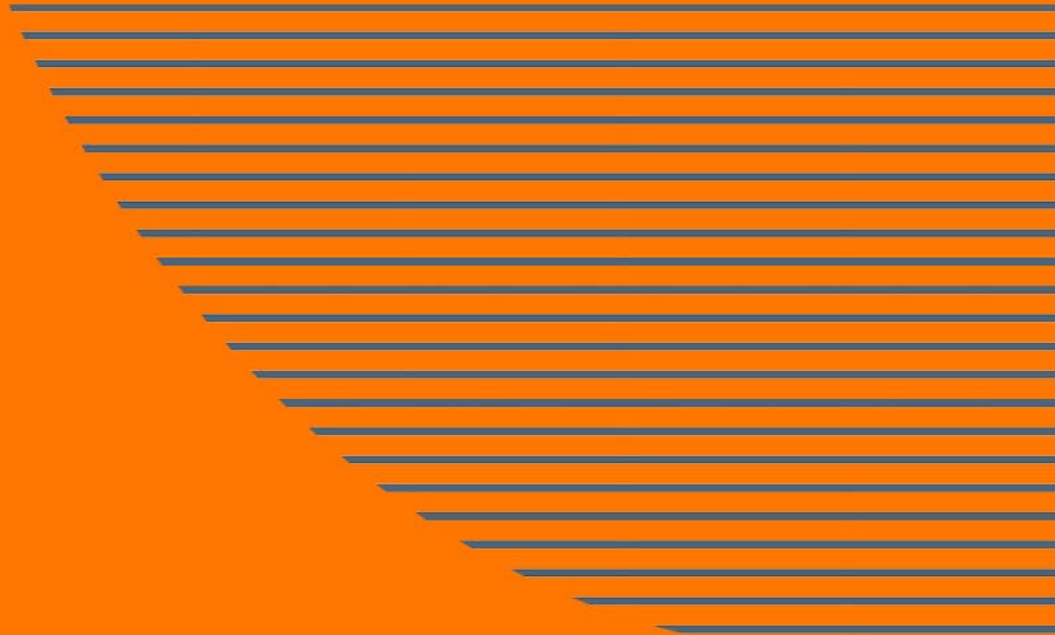
Automated telemetry collection

Admin and Aruba TAC alerts

ACHIEVE NEW IT OUTCOMES

1. Get to root cause and resolution faster

2. Preempt future issues before they happen

3. Eliminate change impact guesswork

4. Deliver the best user experience possible

5. Optimize networks using ML-based peer benchmarks

Dynamic Segmentation

Flexible and Secure Network Segmentation
Aruba Dynamic Segmentation

Users and Devices
- Corporate
- BYOD
- IoT
- Guest

Access Switch

Access Point

ClearPass

Gateway/Controller Cluster

Applications and Destinations
- Office 365
- Academic Records
- n0tma1ware.biz
- AirGroup
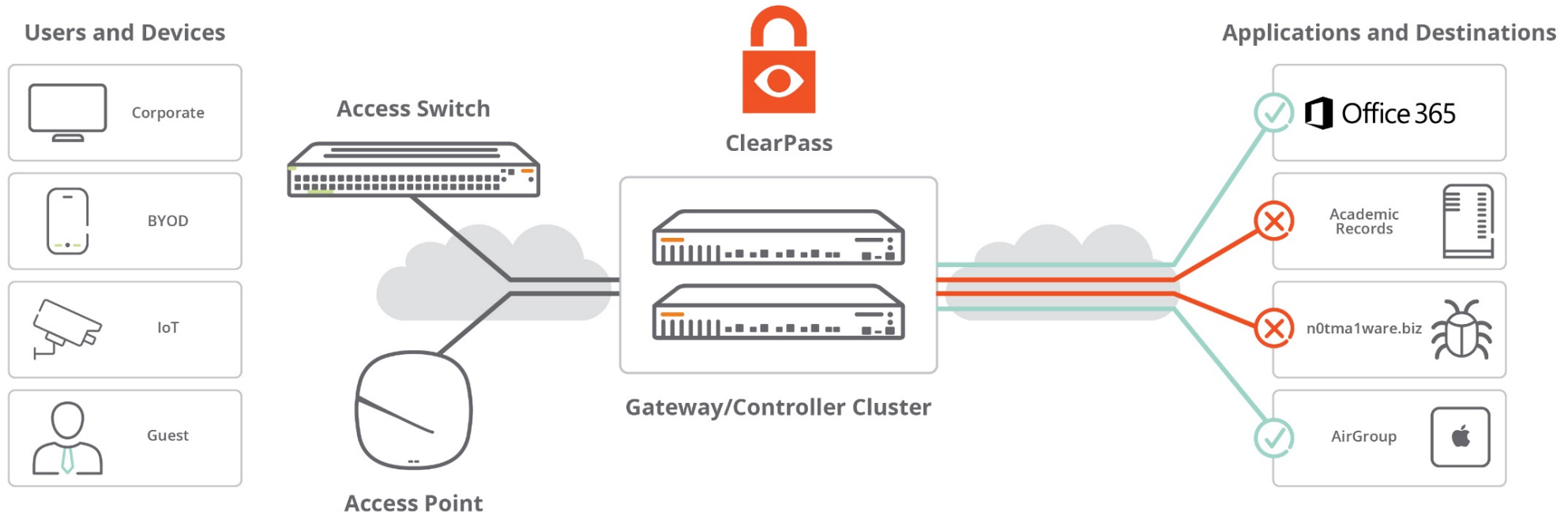
AUTOMATED
Save time and reduce misconfigurations

SEGMENTED
Improve traffic separation and security posture

CENTRALIZED
Enhance visibility and management

ROLE BASED ACCESS IN ARUBA SECURITY GATEWAY

Every user in an Aruba infrastructure is assigned a role

Parameters that can be assigned

- VLAN Assignments
- User-role
- Bandwidth Contracts
- QoS Settings
- Stateful Firewall Policies
- Application/Web/IP policies
- Geo-location policies
- NAT/PAT Policies
- Policy-Based Routing

IT-Role

Access Rules For Selected Roles   +

→ Assign to VLAN: 276

→ Bandwidth Contract: upstream 25000 kbps downstream 25000 kbps (peruser)

● Deny icmp to all destinations

● Deny any to network 172.16.0.0/255.255.0.0

● Allow alg_skype4b_audio to all destinations + 802.1p priority 7

● Allow alg_skype4b_video to all destinations + 802.1p priority 6

● Allow any to all destinations

HR-Role

Access Rules For Selected Roles

→ Assign to VLAN: 276

→ Bandwidth Contract: upstream 10000 kbps (peruser) downstream 10000 kbps

● Deny Streaming to all destinations + time range Students-Limited

● Allow youtube to all destinations + throttle_downstream 1000 + throttle_upstream 1000

● Deny bittorrent to all destinations + blacklist

● Deny any to network 172.16.10.0/255.255.255.0 + log

● Allow any to all destinations

High Performance Segmentation
CX brings switch-to-switch tunnels using VXLAN with MP-BGP EVPN
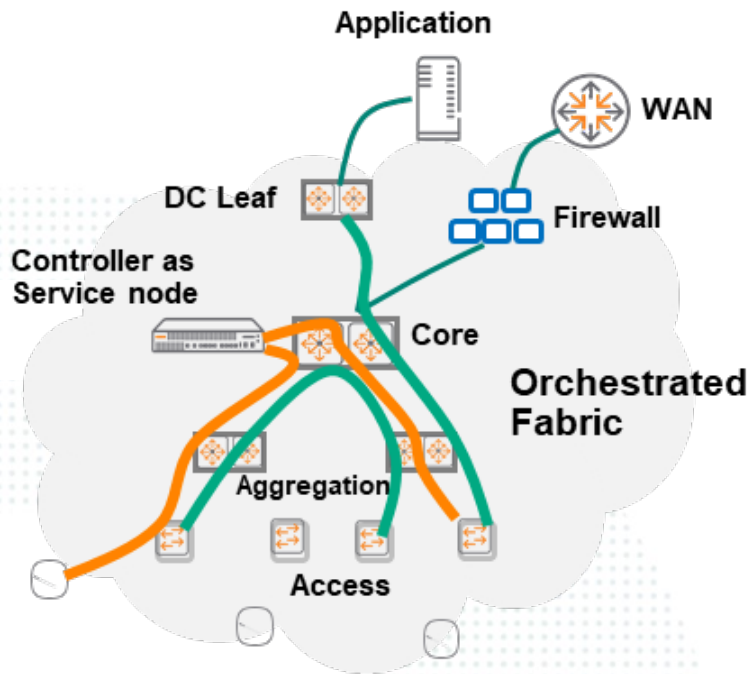
Extending Unified Policies with End-to-End Segmentation across Network

- Centralized policy extending segmentation across multiple sites
- Industry standard VXLAN extends service layers across fabrics, sites and multi-vendor equipment
- Simplify with consistent architecture for campus, branch and data centers
- Agility to move workflows and management to cloud

High Performance and Scalability Deployments

- More flexibility with choice of L2/L3 access & centralized/distributed fabric
- Better granular network service partitions for multi-tenancy with VRFs
- Aruba Gen7 ASICs offers unparalleled performance, scale & policies

Enhanced Troubleshooting Across Network

- Built-in Aruba NAE with Aruba NetEdit provides visibility, deep forensic analytics and automation for quick remediation

Note: VXLAN with MP-BGP and multi-tenancy not supported in CX 6200 platform.

Real World Deployments of Dynamic segmentation

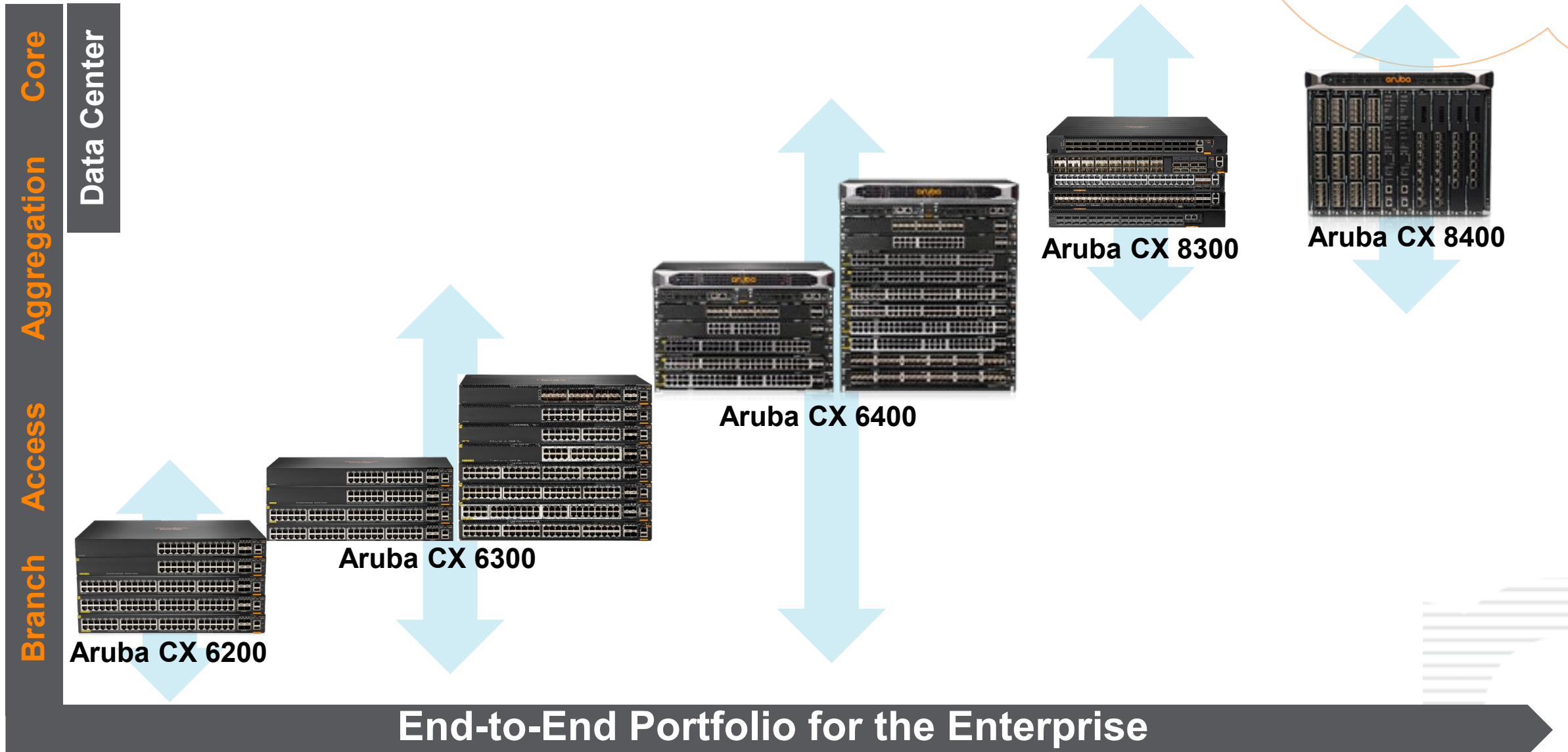| Customer Scenario	Business Benefits
➢ Fortune 500 company – IT / ITES company deployed dynamic segmentation in one of the largest office space of 10K + users. Two buildings and 30 floors	➢ Reduced the real estate cost by 20 % as projects are not tied to specific location. Users can access project resources irrespective of the location
➢ Premier education customer – Deployed dynamic segmentation for secure access of thousands of students	➢ Same access across the campus – Classrooms , hostels , Granular control over application access in LAN infrastructure (Blocked torrent applications in LAN) while allowing collaboration tools
➢ Premier Healthcare customer – Deployed dynamic segmentation for the mission critical infrastructure	➢ Deployed dynamic segmentation to protect the patient data , provides secure access to doctors even from home , granular control on application access, deployed COWs , IOT sensors for proactive monitoring of patients with minimal risk
➢ Fortune 500 company – One of the world's largest skype for business deployment	➢ Integrated skype for business with Aruba infrastructure for Auto QOS, monitoring and visibility of skype for business / MS-Teams

Real World Deployments of Dynamic segmentation

Customer Scenario	Business Benefits
➤ One of the largest retail customer deployed dynamic segmentation in 10K + stores	➤ Reduced the complexity in branch operations , deployed colorless ports , reduced VLANs in branches from 10 to 2 , policies can be enforced now in less than hour vs months in traditional network.
➤ Highly security conscious federal customer – Deployed dynamic segmentation to bring more control on East-West traffic	➤ Deployed dynamic segmentation to bring more visibility and control for East-West traffic – Deployed statefull firewall virtual firewall roles in each switch using dynamic segmentation and access is restricted.
➤ Fortune 500 in Automotive sector – Deployed dynamic segmentation to secure the access of contractors	➤ Contractors traffic will tunnelled to the security gateway in the DMZ zone while employee traffic will be bridged locally.
➤ Premium car manufacturer – Existing Aruba WLAN customer deployed dynamic segmentation across multiple office and factories	➤ Customer want to get visibility similar to WLAN in wired and same access for users across wired and wireless

ARUBA CX SWITCHING

Core
Aggregation
Access
Branch

Data Center

Aruba CX 6200

Aruba CX 6300

Aruba CX 6400

Aruba CX 8300

Aruba CX 8400

End-to-End Portfolio for the Enterprise

The Competition vs. Aruba CX

BUILT FOR VENDOR LOCK-IN

BUILT FOR NETWORK OPERATORS

BUILT FOR VENDOR LOCK-IN	BUILT FOR NETWORK OPERATORS
Disparate Operating Models	**1 Operating Model** with CX portfolio end-to-end
Off-Box Analytics	**Embedded Analytics** in every switch
Proprietary & Inflexible	**Intelligent Automation** with cloud-native OS
Legacy Hardware	**7th Gen ASIC** Data center class performance
Oversubscribed	**Non-Blocking** Distributed architecture
10G for price of 10G	**50G for the price of 10G** for investment protection
Ongoing licensing & subscriptions	**No** software licensing or subscription costs

THANK YOU