

SOLUTION OVERVIEW

Enabling Software-Defined Networks

With Aruba CX Switching

Digital transformation is driving a paradigm shift in networking. As organizations embrace cloud, mobile, IoT and other digital technologies, it's become readily apparent that hardware-centric networks—when managed manually—are impeding business velocity.

The shortcomings are palpable across every domain:

- As more workloads move to the cloud, new networking technologies are needed to connect evolving data center footprints and public cloud infrastructure.
- Campus and branch environments are expanding with new or larger sites to support business growth, but manual network deployments can't keep pace.
- With IoT, edge networks need more intelligence to reliably connect and secure thousands of new devices.
- With application teams adopting DevOps and other agile development methodologies, network admins face mounting pressure to support workload-driven operations.

As a result of these trends, network requirements go far beyond standard connectivity and access technologies of the past. What network teams need is the ability to swiftly configure and update network resources without disrupting existing operations, with intelligent infrastructure that removes bottlenecks and empowers application teams to deliver new services faster.

THE RISE OF SOFTWARE-DEFINED NETWORKS

Software-defined networks (SDN) have emerged in response to these new business requirements. With SDN, intelligence is centralized—rather than distributed—and networks become highly programmable and dynamic.

KEY BENEFITS

- **Boost IT agility:** Orchestrate network-wide changes from a central console and instantly validate updates are successful and conform to corporate policies.
- **Slash OpEx:** Reduce operational costs by eliminating errors and the time it takes to implement changes.
- **Deliver world-class experiences:** Non-blocking performance from edge to data center ensures the best user experience possible.
- **Improve uptime and business continuity:** High fault tolerance at the process and switch level ensures the highest levels of availability, even during software upgrades.
- **Simplify and strengthen security postures:** Dynamic, role-based policies across wired and wireless networks keep traffic segmented and secure.

This means manual, device-by-device changes can be replaced with automation and end-to-end orchestration, where infrastructure is rapidly provisioned, configured and updated as application or business requirements change.

The benefits of SDN-enabled automation and orchestration are compelling. According to Gartner, organizations that automate 70% or more of their network change activities can reduce outages by half while also delivering services 50% faster.¹

¹ Lerner, Andrew, "2019 Network Resolution: Invest in Network Automation," Gartner, Jan. 7, 2019



SOFTWARE-DEFINED NETWORKING WITH ARUBA CX

The Aruba CX Switching Portfolio provides the foundation for a software-defined network. The portfolio combines cutting-edge hardware, cloud-native software, and intuitive management tools that cut IT complexity by accelerating deployments and reducing time spent implementing changes or troubleshooting issues. Based on a single architecture that spans from edge to data center, Aruba CX brings a cloud-like operational model to on-premises infrastructure, with intelligent automation, analytics, and programmability across every domain of the network.

One-touch Provisioning with the Aruba CX Mobile App

As businesses and networks grow, IT often needs to bring new devices or even entire sites online in short windows. This has traditionally involved expensive truck rolls and time-consuming installations, complete with console cables and hefty manuals.

Aruba CX simplifies installation of new switches with an intuitive mobile app that supports any size network project. Pre-built templates for common configurations save time and cut down errors. Using Bluetooth or Wi-Fi for connectivity, the mobile app also detects potential stack members, making it easy to stand up a virtualized stack in just a few taps. All configurations are automatically validated for conformance with corporate policies, ensuring deployments are mistake-free on day 0.

Automate Changes with Aruba NetEdit

Network administrators contend with non-stop moves, adds and changes. Short-staffed teams and device-by-device management using CLI create operational risks, where errors and subsequent downtime are constant threats.

To address this, Aruba NetEdit provides turnkey network automation to orchestrate large-scale configuration changes. Combining an enhanced CLI with intelligent, context-aware assistance and GUI-driven menus, NetEdit doesn't require new skills or programming knowledge. Routine changes are easily implemented and automatically checked for errors and conformance with established security policies—reducing issues while improving network reliability.

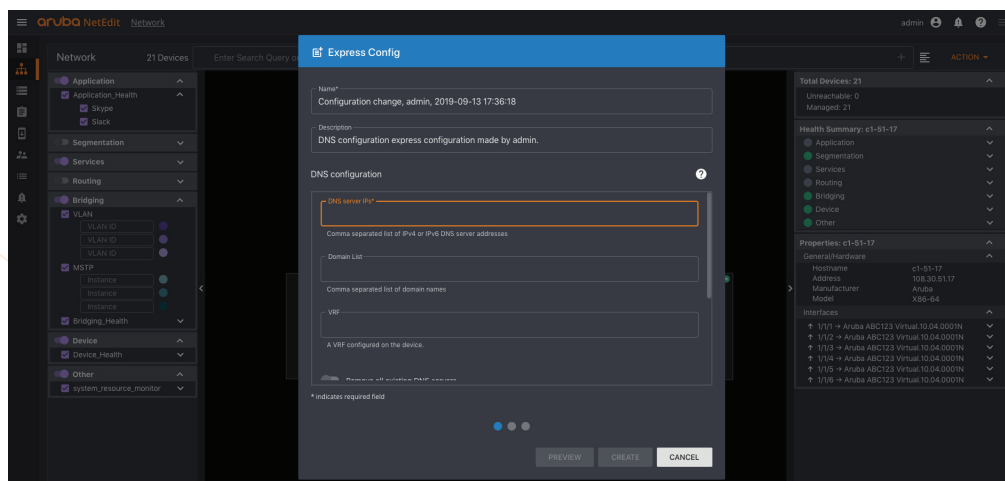


Figure 1: NetEdit provides GUI-driven menus to implement network-wide changes with only a few prompt-driven commands.



Ease of Programmability with AOS-CX

Organizations seeking to build programmability frameworks are often hindered by limitations in networking equipment. By contrast, Aruba CX switches were purpose-built to support custom programmability and automation.

The AOS-CX operating system is cloud native and 100% programmable via REST APIs. All aspects of the system are expressed in the state-oriented database, which provides access to features, functions, and statistics—enabling fast communication between Aruba infrastructure and external platforms to streamline multi-system workflows. A powerful Python framework means network engineers can also easily build scripts to further automate these processes, and no deep coding expertise is required.

Building on an already robust AOS-CX-based automation framework, Aruba also offers solutions which solves the problems faced by data center and IT administrators who often struggle with manual and siloed activities for IT service provisioning across compute, virtualization, storage and network infrastructure environments.

ARUBA FABRIC COMPOSER

Simplified, software-defined network automation

Aruba Fabric Composer is an intelligent, API-driven, software-defined orchestration software tool that simplifies and accelerates leaf-spine network fabric provisioning across rack-scale compute and storage infrastructures. This innovative tool helps increase efficiencies and improve productivity for both network operators and server and virtualization administrators who can benefit from integrated infrastructure management.

What makes Aruba Fabric Composer different from other solutions is that the software orchestrates a discrete set of switches as a single entity in a “fabric” topology which significantly simplifies day-to-day operations and troubleshooting overall.

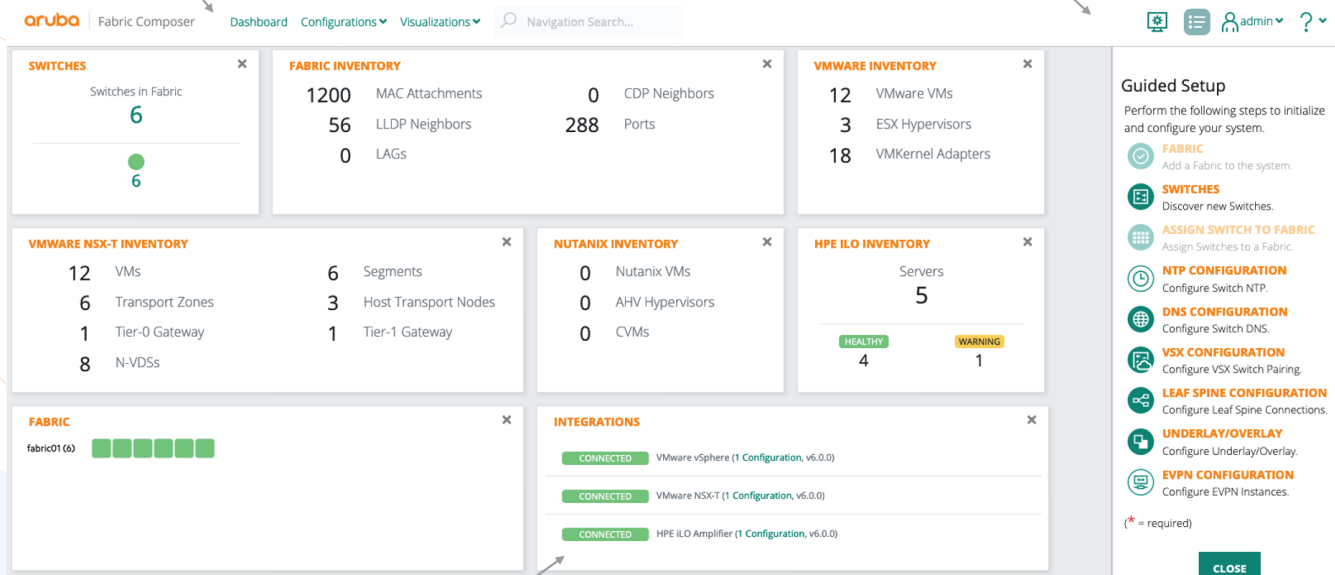
Aruba Fabric Composer is designed to seamlessly work with Aruba CX switches, which optimizes interoperability for improving the performance across a wide variety of virtualized, hyperconverged (HCI), and HPE compute and storage environments. Aruba Fabric Composer is designed to also seamlessly work alongside other Aruba and AOS-CX toolsets like Aruba NetEdit and Aruba Central to give our customers maximum capability and flexibility.

Aruba Fabric Composer Dashboard

Includes information about fabrics, switches, hosts, and VMs

Workflow Automations and Guided Setup

Simple point and click GUI streamlines and automates away complexity



API level integrations with various environments
 Including HPE, Aruba, VMware vSphere, ESX, NSX and Nutanix

Figure 2: Aruba Fabric Composer GUI



Furthermore, the combination of Aruba Fabric Composer and CX switches can also support non-HPE environments, allowing these deployments to also enjoy the benefits of automated fabric provisioning and ecosystem integration into 3rd party IT automation frameworks from VMware, Nutanix and HPE solutions.

Event-Driven Automation with Aruba NAE

The occasional performance issue is inevitable in today's hyper-complex, distributed IT environments. Unfortunately, traditional approaches to monitoring and troubleshooting network- or user-impacting issues are far too reactive, with fragmented data and limited actionable insights.

Aruba CX switches combine analytics with automation to take action when pre-defined events occur. The **Aruba Network Analytics Engine (NAE)** monitors network traffic and usage for indications of declining application or network health, as well as for possible malicious activity.

When an event happens, such as an SLA violation, NAE agents can automatically trigger alerts, generate tickets in ServiceNow or other leading ITSM tools, and begin gathering data to jumpstart troubleshooting—all without operator intervention. This data can also be used to analyze trends, prioritize improvement efforts, and aid future capacity planning requirements.

Policy Automation and Orchestration

Maintaining VLANs, ACLs, and subnets at every hop in the network is untenable today. Growing application, device, and user demands in the era of cloud and IoT make it nearly impossible to properly segment traffic using these manual methods.

Aruba Dynamic Segmentation dramatically simplifies security by automatically orchestrating and enforcing user, device and application-aware policies on Aruba wired and wireless networks. Automated device profiling, role-based access control, and a Layer 7 firewall deliver enhanced visibility and a better experience for both IT and end users.

As an integral component of Dynamic Segmentation, Aruba CX provides flexibility to establish switch-to-switch tunnels using VXLAN and BGP EVPN for higher performance and scalability, as well as tunneling to a central controller for L4-L7 services.

Lifecycle Automation with Support for Ansible

Aruba has partnered with Ansible to bridge the gap between programmer and network engineer by making automation simple and easily integrated into campus and data center environments. Certified, fully-tested modules are available to automate the provisioning, onboarding, and management of Aruba CX switches. All modules for Ansible use REST APIs for communication, which makes for a faster and more reliable automation framework.

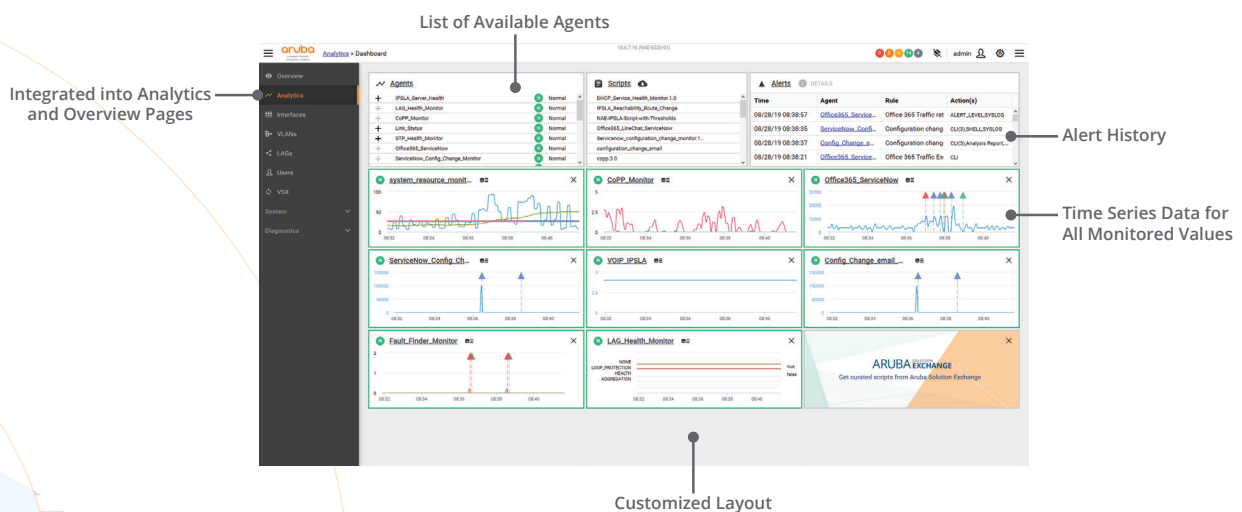


Figure 3: Aruba NAE provides always-on monitoring with built-in diagnostics and dynamic actions in every network node.

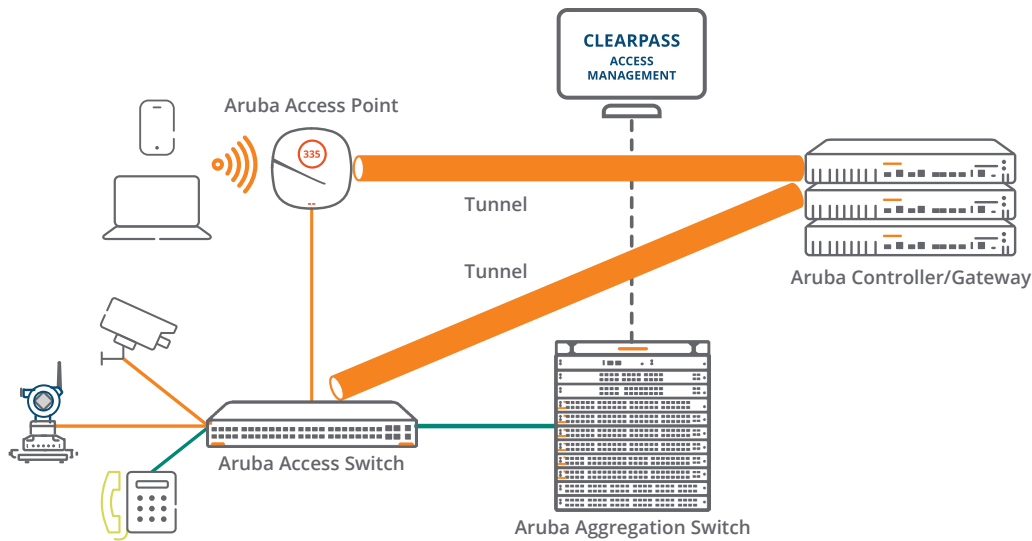


Figure 4: Aruba Dynamic Segmentation provides unified, role-based policy enforcement across wired and wireless networks.

Certified Integration with VMware NSX

Many organizations have virtualized aspects of their data center networks. However, the network underlay is still vital as IT continues to operate in a hybrid model. In particular, ensuring resilient, high-performing connectivity between physical and virtual infrastructure will be key.

Aruba CX bridges these worlds through tight integration with VMware NSX. Full programmability and a rich feature set ensure low-latency, optimized traffic flows between underlay and overlay networks, with deep insights to swiftly troubleshoot and resolve connectivity issues or other potential problems.

MODERNIZE YOUR NETWORK WITH ARUBA CX

To thrive in the digital era, businesses need networks that are software-defined, not hardware-confined. With cutting-edge switching platforms powered by cloud-native software, the Aruba CX Switching Portfolio delivers a number of SDN-ready capabilities, bringing intelligent automation, powerful analytics, and ease of programmability across the network.

The result is a cloud-like operational experience that empowers IT to support evolving business requirements in a frictionless manner, without compromising the performance or availability of existing services.

To learn more, please visit: <https://www.arubanetworks.com/products/networking/switches/>