Overview

HPE Aruba Networking CX 6400 Switch Series

The HPE Aruba Networking CX 6400 Switch Series is a modern, flexible and intelligent family of modular switches ideal for access, aggregation and core in enterprise campus and data center deployments. Created for game-changing operational efficiency with built-in security and resiliency, the 6400 switches provide the foundation for high-performance networks supporting IoT, mobile and cloud applications.

Built from the ground up with a combination of cutting- edge hardware, software and analytics and automation tools, the 6400 switches are part of the HPE Aruba Networking CX switching portfolio, designed for today's enterprise campus, branch and data center networks. By combining a modern, fully programmable OS with the HPE Aruba Networking Network Analytics Engine, the 6400 switches provide industry leading monitoring and troubleshooting capabilities across the network.

A powerful HPE Aruba Networking Gen7 ASIC architecture delivers performance and robust feature support with flexible programmability for tomorrow's applications. The HPE Aruba Networking Virtual Switching Extension (VSX) allows for high availability, and also enables non-disruptive fast upgrades and simplified management. This flexible series offers powerful connectivity options in a 5 or 10 slot compact chassis with non-blocking 2.8Tb fabric per slot and high density IEEE 802.3bt high power PoE. HPE Smart Rate multi-gigabit Ethernet paves the way for high speed access points and IoT devices by delivering fast connectivity and high power PoE using existing cabling. Line rate interfaces include 1GbE, 10GbE, 25GbE, 40GbE, 50GbE[1] and 100GbE ports (50GbE transceiver capability will
be enabled in future software release). High speed interconnect and HPE Aruba Networking VSX using 50G DACs.
Notes: [1]50GbE capability is for use with 50G DACs for both interconnect and HPE Aruba Networking VSX. 50GbE transceiver capability enabled by future software release.

Dynamic segmentation extends HPE Aruba Networking's foundational wireless role-based policy capability to HPE Aruba Networking wired switches. What this means is that the same security, user experience and simplified IT management can be enjoyed throughout the network. Regardless of how users and IoT devices connect, consistent policies are enforced across wired and wireless networks, keeping traffic secure and separate.

HPE Aruba Networking CX 6400 Switch Series

Overview

Key Features

- Powerful, modular Layer 3 switches with BGP, MPLS, EVPN, VXLAN, VRF, and OSPF with robust security and QoS
- High performance switching with up to 28 Tbps with 11.4 Bpps
- High availability with industry-leading VSX redundancy and redundant power supplies and fans
- Full density HPE Smart Rate (1/2.5/5GbE) multi- gigabit, 60W PoE and SFP+ modules
- High speed, non-blocking 1GbE, 10GbE, 25GbE, 40GbE, 50GbE[1] and 100GbE ports (50GbE capability is for use with 50G DACs for both interconnect and HPE Aruba Networking VSX. 50GbE transceiver capability enabled by future software release)
- Intelligent monitoring, visibility, and remediation with HPE Aruba Networking Network Analytics Engine
- Manage via single pane of glass with HPE Aruba Networking Central across wired, wireless, and WAN
- HPE Aruba Networking NetEdit support for automated configuration and verification
- Dynamic segmentation enables secure and simple access for users and IoT devices

Standard Features

AOS-CX - A Modern Operating System

The HPE Aruba Networking CX 6400 Switch Seriesis based on AOS- CX, a modern, database-driven operating system that automates and simplifies many critical and complex network tasks. A built-in time series database enables customers and developers to utilize software scripts for historical troubleshooting, as well as analysis of past trends. This helps predict and avoid future problems due to scale, security, and performance bottlenecks. AOS-CX operating system features are organized into HPE Aruba Networking CX Foundation and HPE Aruba Networking CX Advanced software licenses.

Every HPE Aruba Networking CX switch includes an active, embedded HPE Aruba Networking CX Foundation license at no additional cost with the option to upgrade to an HPE Aruba Networking CX Advanced license.

The CX Foundation license has everything needed to deploy, connect, and troubleshoot an enterprise network, including:

- HPE Aruba Networking Network Analytics Engine (NAE)
- Dynamic Segmentation
- Switch Stacking
- High Availability and Resiliency
- Quality of Service (QoS)
- Layer 2 Switching
- Layer 3 Services and Routing
- IP Multicast
- Network Security
- Support for HPE Aruba Networking NetEdit

The HPE Aruba Networking CX Advanced license includes HPE Aruba Networking CX Edge Insights, offering deep visibility with application recognition, identification, and flow capture from layer 4 to layer 7.

For more information on the CX Advanced License, read the **HPE Aruba Networking CX Switch License Ordering Guide**

Because AOS- CX is built on a modular Linux* architecture with a stateful database, our operating system provides the following unique capabilities:

- Easy access to all network state information allows unique visibility and analytics
- REST APIs and Python scripting for fine-grained programmability of network tasks
- A micro-services architecture that enables full integration with other workflow systems and services
- Continual state synchronization that provides superior fault tolerance and high availability
- Continuous telemetry data with WebSocket subscriptions for event driven automation
- All software processes communicate with the database rather than each other, ensuring near real-time state and resiliency and allowing individual software modules to be independently upgraded for higher availability

Notes: *Supported in a future software release.

HPE Aruba Networking Central - Unified Single Pane of Glass Management

HPE Aruba Networking Central is an AI-powered solution that simplifies IT operations, improves agility, and reduces costs by unifying management of all network infrastructure. Built for enterprise-grade resiliency and security, while simple enough for smaller businesses with limited IT staff, HPE Aruba Networking Central is your single point of visibility and control that spans the entire network --from branch to data center, wired and wireless LAN to WAN.

Available as a cloud-based or on-premises solution, HPE Aruba Networking Central is designed to simplify day zero through day two operations with streamlined workflows for tasks such as virtual switch stack creation, automated monitoring using AI-powered insights and NAE, as well as a unified view of all devices and users, both wired and wireless. Comprehensive switch management capabilities include configuration, on-boarding, monitoring, troubleshooting, and reporting.

An HPE Aruba Networking Central Foundation license subscription enables comprehensive switch management capabilities that include configuration, onboarding, monitoring, troubleshooting, and reporting. An HPE Aruba Networking Central Advanced license expands these capabilities with premium security and AIOps, including the HPE Aruba Networking Central NetConductor Fabric Wizard and Policy Manager to enable dynamic segmentation and distributed enforcement at a global scale.

Standard Features

With the HPE Aruba Networking Central Advanced license there is no need to purchase a CX Advanced license. This streamlines operational efficiency, reducing the need for your IT team to keep track of multiple licenses, active terms, and renewal dates. For more information on HPE Aruba Networking Central licensing, see the **HPE Aruba Networking Central SaaS Subscription Ordering Guide.**

HPE Aruba Networking Network Analytics Engine - Advanced Monitoring and Diagnostics

For enhanced visibility and troubleshooting, HPE Aruba Networking's Network Analytics Engine (NAE) automatically monitors and analyzes events that can impact network health. Advanced telemetry and automation provide the ability to easily identify and troubleshoot network, system, application and security related issues easily, through the use of Python agents, CLI-based agents,and REST APIs.

The Time Series Database (TSDB) stores configuration and operational state data, making it available to quickly resolve network issues. The data may also be used to analyze trends, identify anomalies and predict future capacity requirements.

HPE Aruba Networking Central uses NAE and agents to deliver switch monitoring, analytics, and enhanced troubleshooting for wired assurance. HPE Aruba Networking NetEdit and third-party tools such as ServiceNow and Slack provide the intelligence to integrate NAE alerts into IT service management processes, speeding problem resolution.

HPE Aruba Networking NetEdit – Automated Switch Configuration and Management

The HPE Aruba Networking CX portfolio empowers IT teams to orchestrate multiple switch configuration changes for smooth end-to-end service rollouts. HPE Aruba Networking NetEdit introduces automation that allows for rapid network-wide changes, and ensures policy conformance post network updates. Intelligent capabilities include search, edit, validation (including conformance checking), deployment and audit features. Capabilities include:

- Centralized configuration with validation for consistency and compliance
- Time savings via simultaneous viewing and editing of multiple configurations
- Customized validation tests for corporate compliance and network change analysis
- Automated large-scale configuration deployment without programming
- Network health and topology visibility via Aruba NAE integration

Notes: A separate software license is required to use HPE Aruba Networking NetEdit.

HPE Aruba Networking CX Mobile App – True Deployment Convenience

An easy to use mobile app simplifies connecting and managing HPE Aruba Networking CX 6400 Switch Series for any size project. Switch information can also be imported into HPE Aruba Networking NetEdit for simplified configuration management and to continuously validate the conformance of configurations anywhere in the network. The HPE Aruba Networking CX Mobile App is available for **download.**

Software-Defined Orchestration for Data Center Networks

Aruba Fabric Composer is an intelligent, software-defined orchestration solution that simplifies and accelerates network provisioning, security management and day-to-day operations across enterprise IT network infrastructures. What makes Aruba Fabric Composer different from other solutions is its ability to orchestrate a discrete set of switches as a single networking fabric to simplify operations and troubleshooting. This infrastructure and application-aware solution also automate various configuration and life cycle events. Aruba Fabric Composer provides a series of workflows that are both interactive and automated which abstract the administrative complexities of setting up complex enterprise networking environments.

Aruba ASICs - Programmable Innovation

Based on over 30 years of continuous investment, HPE Aruba Networking's ASICs create the basis for innovative and agile software feature advancements, unparalleled performance, and deep visibility. These programmable ASICs are purpose-built to allow for a tighter integration of switch hardware and software within campus and data center architectures to optimize performance and capacity. Virtual Output Queuing (VOQ) isolates congestion, prevents Head of Line Blocking (HOLB) and allows full line rate on outgoing (egress) ports. Flexible ASIC resources enable HPE Aruba Networking's NAE solution to inspect all data, which allows for industry-leading analytics capabilities. The HPE Aruba Networking CX 6400 Switch Series is based on the HPE Aruba Networking Gen7 ASIC architecture.

Standard Features

Dynamic Segmentation – Campus and Branch Fabric

The dynamic segmentation solution enables seamless mobility, consistent policy enforcement, and automated configurations for wired and wireless clients across networks of all sizes. It unifies role-based access and policy enforcement across LAN, WLAN, and SD-WAN networks with centralized policy definition and dedicated enforcement points, ensuring that users and devices can only communicate with destinations consistent with their role - keeping traffic secure and separate. Dynamic Segmentation is based on establishing least privilege access to IT resources by segmenting traffic based on identity, a fundamental concept of both Zero Trust and SASE frameworks where trust is based on roles and policies, not on where and how a user or device connects.

This innovation begins with colourless ports and role-based micro-segmentation technologies. Colourless ports allow wired clients to connect to any switch port, with the configuration automated using RADIUS-based access control. This eliminates the need for manual on-boarding of clients, including IoT devices, onto the network.

Role-based micro-segmentation delivers benefits of reduced subnet and VLAN sprawl, simplified policy definition, and scalable policy enforcement by introducing the concept of client user roles. Independent of network constructs such as VLANs and VRFs, clients can be grouped into a user role based on their identity, allowing the colourless ports technology to be extended to the centralized overlay fabric, as clients are on-boarded with automatic tunnel creation based on the associated user roles policy. The user roles policy offers the choice between micro-segmentation using centralized and unified policy enforcement for wireless and wired traffic with Layer 7 stateful firewall on gateways or a distributed approach with a Layer 4 role-role ACL on switches.

Dynamic Segmentation provides scale and flexibility in network design by allowing the stretching of VLANs and subnets across the entire network with an EVPN/VXLAN-based distributed overlay fabric. Fabric overlays use VXLAN or VXLAN-GBP tunnels on the data plane and provide the option of a Multi-Protocol BGP EVPN control plane for large deployments, or a static Layer 2 control plane for simplified deployments.

Mobility and IoT Performance

The HPE Aruba Networking CX 6400 Switch Series uses a fully distributed architecture that utilizes the HPE Aruba Networking Gen7 ASICs. This ensures that our switches offer very low latency, increased packet buffering, and adaptive power consumption. All switching and routing are wire-speed to meet the demands of bandwidth-intensive applications today and in the future.

Each switch includes the following:

- Up to 28 Tbps in non-blocking bandwidth and up to 11.4 Bpps for forwarding available on the fabric
- 100GbE uplinks and large TCAM sizes to cater to mobility and IoT deployments in large campuses with several thousand clients
- Selectable queue configurations that allow for increased performance by defining a number of queues and associated memory buffering to best meet the requirements of network applications
- Increased power efficiency and savings via 80 PLUS Platinum Certified power supplies

HPE Aruba Networking Virtual Switching Extension (VSX)

The ability of AOS-CX to maintain synchronous state across dual control planes allows a simplified carrier-class high availability solution called HPE Aruba Networking Virtual Switching Extension (VSX). Designed using the best features of existing high availability technologies such as Multi-chassis Link Aggregation (MC LAG), HPE Aruba Networking VSX enables a distributed architecture that is highly available during upgrades or control plane events. Features include:

- Continuous configuration synchronization via AOS-CX
- Flexible active-active network designs at Layers 2 and 3
- Operational simplicity and usability for easy configuration
- High availability by design during upgrades including support for VSX Live Upgrade with LACP traffic draining
- ISSU support for single chassis (dual management plane)

Standard Features

An HPE Aruba Networking CX 6400 Switch Series For Any Enterprise Environment

Whether in small to large enterprise environments, you can choose from two models ideal for access, aggregation and core deployments. Features of the 5 and 10 slot models include:

- Compact 5 slot (7 RU) and 10 slot (12 RU) support a choice of line cards and redundant, half-width management modules
- High density connectivity ideal for aggregation provides up to 480 ports of HPE Smart Rate multi-gigabit (1/2.5/5GbE) with IEEE 802.3bt High Power PoE (60W)
- Up to 240 ports of 10GBASE-T ideal for high performance desktop and server connections
- Convenient combination modules with four high speed uplinks (10GbE/25GbE)[1]
- High speed, non-blocking modules with 1GbE, 10GbE, 25GbE, 40GbE, 50GbE[1] and 100GbE ports
- High speed interconnect and HPE Aruba Networking VSX using 50G DACs
- Industry standard IEEE 802.3bt High Power PoE support (class 6) provides up to 60W per port for support of the latest IoT devices and APs. PoE support for IEEE 802.3at Power over Ethernet (PoE+) provides up to 30W per port as well as any IEEE 802.3af-compliant end device
- High availability with Always-On PoE, that continues to keep supplying PoE power even during scheduled reboots and firmware upgrades
- Quick PoE supplies PoE power to powered devices as soon as the switch is plugged into AC power so device can initialize at same time as switch OS boots up
- Support for pre-standard PoE detection provides power to legacy PoE devices
- Support for Energy Efficient Ethernet IEEE 802.3az reduces power consumption during periods of low network traffic
- Auto-MDIX provides automatic adjustments for straight- through or crossover cables on all 10/100/1000 ports, Smart Rate and 10GBASE-T ports
- Unsupported Transceiver Mode (UTM) allows to insert and enable all unsupported 1G and 10G transceivers and cables. Note that there is no warranty nor support for the transceiver/cable when this feature is used
- IPv6 capabilities include:
  - IPv6 host enables switches to be managed in an IPv6 network
  - Dual stack (IPv4 and IPv6) transitions from IPv4 to IPv6, supporting connectivity for both protocols
  - MLD snooping forwards IPv6 multicast traffic to the appropriate interface
  - IPv6 ACL/QoS supports ACL and QoS for IPv6 network traffic
  - IPv6 routing supports Static and OSPFv3 protocols
  - Security provides RA guard, DHCPv6 protection, dynamic IPv6 lockdown, ND snooping, IPv6 Destination Guard, IPv6 DHCP Guard,and IPv6 Router Advertisement Guard
- Jumbo frames allow for high-performance backups and disaster-recovery systems; provides a maximum frame size of 9198 bytes
- Packet storm protection against broadcast and multicast storms with user-defined thresholds
- Smart link enables simple, fast converging link redundancy and load balancing with dual uplinks avoiding Spanning Tree complexities

Notes: [1]50GbE capability is for use with 50G DACs for both interconnect and HPE Aruba Networking VSX. 50GbE transceiver capability enabled by future software release.

High Availability and Resiliency

To ensure a high degree of up-time we offer high availability and multicast features needed for a full Layer 3 deployment at access and aggregation such as PBR, MSDP, BSR, and IP SLA without the need for software licenses. This includes:

- AOS-CX software resiliency with VSX
- Hot Swappable Power Supplies
  - Provide N+1 and N+N redundancy for high reliability in case of power line or supply failure
  - Increases total performance and power availability while providing hitless, stateful failover
- Virtual Router Redundancy Protocol (VRRP) allows groups of two routers to dynamically create highly available routed environments in IPV4 and IPV6 networks
- Uni-directional Link Detection (UDLD) to monitor link connectivity and shut down ports at both ends if uni- directional traffic is detected, preventing loops in STP- based networks

Standard Features

- IEEE 802.3ad LACP supports up to 256 LAGs, each with up to 8 links per LAG; and provides support for static or dynamic groups and a user-selectable hashing algorithm
- Supports LACP-fallback to enable zero touch provisioning over LAGs, keeping LAG ports active and separate when no LACP partner is detected
- IEEE 802.1s Multiple Spanning Tree provides high link availability in VLAN environments where multiple spanning trees are required and legacy support for IEEE 802.1d and IEEE 802.1w
- IEEE 802.3ad link-aggregation-control protocol (LACP) and port trunking supports static and dynamic trunks where each trunk supports up to eight links (ports) per static trunk
- Support for Microsoft Network Load Balancer (NLB) for server applications
- Ethernet Ring Protection Switching (ERPS) supports rapid protection and recovery in a ring topology

Quality of Service (QoS) Features

To support congestion actions and traffic prioritization, the HPE Aruba Networking CX 6400 Switch Series includes the following:

- Supports Label Distribution Protocol Graceful Restart (LDP-GR) for faster failure recovery
- Strict priority (SP) queuing and Deficit Weighted Round Robin (DWRR)
- Traffic prioritization (IEEE 802.1p) for real-time classification
- Class of Service (CoS) sets the IEEE 802.1p priority tag based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, and DiffServ
- Rate limiting sets per-port ingress enforced maximums and per-port, per-queue minimums
- Transmission rates of egressing frames can be limited on a per-queue basis using Egress Queue Shaping (EQS)
- Large buffers for graceful congestion management

Simplified Configuration and Management

In addition to the HPE Aruba Networking Central, the HPE Aruba Networking CX Mobile App, HPE Aruba Networking NetEdit and HPE Aruba Networking Network Analytics Engine, the 6400 series offers the following:

- Built-in programmable and easy to use REST API interface
- Simple day zero provisioning
- Scalable ASIC-based wire speed network monitoring and accounting with no impact on network performance; network operators can gather a variety of network statistics and information for capacity planning and realtime network monitoring purposes
- Management interface control enables or disables each of the following depending on security preferences, console port, or reset button
- Industry-standard CLI with a hierarchical structure for reduced training time and expense. Delivers increased productivity in multivendor environments
- Management security restricts access to critical configuration commands, provides multiple privilege levels with password protection, and local and remote syslog capabilities allow logging of all access
- SNMP v2c/v3 provides SNMP read and trap support of industry standard Management Information Base (MIB), and private extensions sFlow (RFC 3176)
- IP Flow Information Export (IPFix) enables client flow information collection to enhance visibility
- Simplifies configuration while onboarding switches with Zero Touch Provisioning by using Dynamic Border Gateway Protocol (BGP) peering to establish a peer group of switches within an IP range
- Enhanced visibility during client onboarding, providing insights on latency, failures, and error events
- SNMP support includes: Write Set Speed and Duplex, Write Port Security, Write POE Priority, Write Config Mgmt, SNMP-Read single OID for average CPU and memory, SNMP MIB View
- SNMP Trap include: Transceiver Traps (insertion/removal), SNMP Trap, SNMP MIB-SNMB Authentication, SNMPv2 MIB, Port Sec MIB-Port Sec, Config MIB-Running Config Change, Config MIB, AAA Server MIB, AAA Server State
- Remote monitoring (RMON) with standard SNMP to monitor essential network functions. Supports events, alarms, history, and statistics groups as well as a private alarm extension group; RMON, and sFlow provide advanced monitoring and reporting capabilities for statistics, history, alarms and events
- TFTP and SFTP support offers different mechanisms for configuration updates; trivial FTP (TFTP) allows bidirectional transfers over a TCP/ IP network; Secure File Transfer Protocol (SFTP) runs over an SSH tunnel to provide additional security

Standard Features

- Debug and sampler utility supports ping and traceroute for IPv4 and IPv6
- Network Time Protocol (NTP) synchronizes timekeeping among distributed time servers and clients; keeps timekeeping consistent among all clock-dependent devices within the network so the devices can provide diverse applications based on the consistent time
- IEEE 802.1AB Link Layer Discovery Protocol (LLDP) advertises and receives management information from adjacent devices on a network, facilitating easy mapping by network management applications
- Dual flash images provides independent primary and secondary operating system files for backup while upgrading
- Assignment of descriptive names to ports for easy identification
- Multiple configuration files can be stored to a flash image
- Ingress and egress port monitoring enable more efficient network problem solving
- Unidirectional link detection (UDLD) monitors the link between two switches and blocks the ports on both ends of the link if the link goes down at any point between the two devices
- IP SLA for Voice monitors quality of voice traffic using the UDP Jitter and UDP Jitter for VoIP tests
- Client telemetries and application visibility using IP Flow Information Export (IPFix), Deep Packet Inspection (DPI) and traffic insights
- Simplifies configuration while onboarding switches with Zero Touch Provisioning by using Dynamic Border Gateway Protocol (BGP) peering to establish a peer group of switches within an IP range
- Enhanced visibility during client onboarding, providing insights on latency, failures, and error events

Layer 2 Switching

The following layer 2 services are supported:

- VLAN support and tagging for IEEE 802.1Q (4094 VLAN IDs)
- Jumbo packet support improves the performance of large data transfers; supports frame size of up to 9198 bytes
- IEEE 802.1v protocol VLANs isolate select non-IPv4 protocols automatically into their own VLANs
- Rapid Per-VLAN Spanning Tree (RPVST+) allows each VLAN to build a separate spanning tree to improve link bandwidth usage; is compatible with PVST+
- MVRP allows automatic learning and dynamic assignment of VLANs
- VXLAN encapsulation (tunnelling) protocol for overlay network that enables a more scalable virtual network deployment
- Bridge Protocol Data Unit (BPDU) tunnelling Transmits STP BPDUs transparently, allowing correct tree calculations across service providers, WANs, or MANs
- Port mirroring duplicates port traffic (ingress and egress) to a monitoring port; supports 4 mirroring groups
- STP supports standard IEEE 802.1D STP, IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) for faster convergence, and IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
- Internet Group Management Protocol (IGMP) Controls and manages the flooding of multicast packets in a Layer 2 network
- IPv4 Multicast in VXLAN/EVPN Overlay support allows PIM-SM/IGMP snooping in the VXLAN Overlay
- IPv6 VXLAN/EVPN Overlay support, allows IPv6 traffic over the VXLAN overlay
- VXLAN ARP/ND suppression allows minimization of ARP and ND traffic flooding within individual VXLAN segments, thus optimizing the VXLAN network
- QinQ support to improve the VLAN utilization by adding another 802.1Q tag to tagged packets

Layer 3 Services

The following layer 3 services are supported:

- User Datagram Protocol (UDP) helper function allows UDP broadcasts to be directed across router interfaces to specific IP unicast or subnet broadcast addresses and prevents server spoofing for UDP services such as DHCP
- Loopback interface address defines an address in Open Shortest Path First (OSPF), improving diagnostic capability
- Route maps provide more control during route redistribution; allow filtering and altering of route metrics
- Address Resolution Protocol (ARP) determines the MAC address of another IP host in the same subnet; supports static ARPs; gratuitous ARP allows detection of duplicate IP addresses; proxy ARP allows normal ARP operation between subnets or when subnets are separated by a Layer 2 network
- Dynamic Host Configuration Protocol (DHCP) simplifies the management of large IP networks and supports client; DHCP Relay enables DHCP operation across subnets

Standard Features

- DHCP server centralizes and reduces the cost of IPv4 address management
- Domain Name System (DNS) provides a distributed database that translates domain names and IP addresses, which simplifies network design; supports client and server
- Generic Routing Encapsulation (GRE) enables tunneling traffic from site to site over a Layer 3 path syslog capabilities allow logging of all access
- Supports internal loopback testing for maintenance purposes and increased availability; loopback detection protects against incorrect cabling or network configurations and can be enabled on a per-port or per-VLAN basis for added flexibility
- mDNS (Multicast Domain Name System) Gateway enables discovery of mDNS groups across L3 boundaries
- IP sub-interface is a virtual interface created by dividing physical interface into multiple logical interfaces tagged using different VLAN-IDs. A physical interface can be a regular physical, Split port or LAG L3 interface. A sub-interface is used for many uses-cases such as VRF-lite interconnection and inter-vlan routing (router on-a-stick)

Layer 3 Routing

The following layer 3 routing services are supported:

- Border Gateway Protocol (BGP) provides IPv4 and IPv6 routing, which is scalable, robust, and flexible
- Border Gateway Protocol 4 (BGP-4) delivers an implementation of the Exterior Gateway Protocol (EGP) utilizing path vectors; uses TCP for enhanced reliability for the route discovery process; reduces bandwidth consumption by advertising only incremental updates; supports extensive policies for increased flexibility; scales to very large networks with graceful restart capability
- Multiprotocol Label Switching (MPLS) provides network scalability with connection-oriented label switching for various network protocols. Includes support for ECMP, PE-CE routing, and L3 VPN
- Equal-Cost Multipath (ECMP) enables multiple equal-cost links in a routing environment to increase link redundancy and scale bandwidth
- Multi-protocol BGP (MP-BGP) enables sharing of IPv6 routes using BGP and connections to BGP peers using IPv6
- Routing Information Protocol version 2 (RIPv2) provides an easy to configure routing protocol for small networks as while RIPng provides support for small IPv6 networks
- Open shortest path first (OSPF) delivers faster convergence; uses link-state routing Interior Gateway Protocol (IGP), which supports ECMP, NSSA, and MD5 authentication for increased security and graceful restart for faster failure recovery
- OSPF provides OSPFv2 for IPv4 routing and OSPFv3 for IPv6 routing
- Static IP routing provides manually configured routing; includes ECMP capability
- Policy-based routing uses a classifier to select traffic that can be forwarded based on policy set by the network administrator
- Static IPv4 and IPv6 routing provides simple manually configured IPv4 and IPv6 routes
- IP performance optimization provides a set of tools to improve the performance of IPv4 networks; includes directed broadcasts, customization of TCP parameters, support of ICMP error packets, and extensive display capabilities
- Dual IP stack maintains separate stacks for IPv4 and IPv6 to ease the transition from an IPv4-only network to an IPv6-only network design
- Supports ECMP, PE-CE routing, and L3 VPN for MPLS

Visibility

Customers can choose to upgrade the active, embedded CX Foundation license to the term based CX Advanced license to unlock the following benefits for their business:

Delivers deep visibility with HPE Aruba Networking CX Edge Insights for application recognition, identification, and flow capture from layer 4 to layer 7. CX Edge Insights enables granular datapoint collection with search, sort and reporting as well as the ability to recognize 22 categories and more than 3700 applications.

Standard Features

Security

The HPE Aruba Networking CX 6400 Switch Series come with an integrated trusted platform module (TPM) for platform integrity. This ensure the boot process started from a trusted combination of HPE Aruba Networking AOS-CX switches. Other security features include:

- AOS-CX uses FIPS 140-2 validated cryptography for protection of sensitive information.
- Access control list (ACL) support for both IPv4 and IPv6; allows for filtering traffic to prevent unauthorized users from accessing the network, or for controlling network traffic to save resources; rules can either deny or permit traffic to be forwarded; rules can be based on a Layer 2 header or a Layer 3 protocol header
- ACLs also provide filtering based on the IP field, source/ destination IP address/subnet, and source/ destination TCP/UDP port number on a per-VLAN or per-port basis
- Remote Authentication Dial-In User Service (RADIUS)
- Terminal Access Controller Access-Control System (TACACS+) delivers an authentication tool using TCP with encryption of the full authentication request, providing additional security
- Enrollment over Secure Transport (EST) enables secure certificate enrollment, allowing for easier enterprise management of PKI
- Management access security for both on- and off- box authentication for administrative access. RADIUS or TACACS+ can be used to provide encrypted user authentication. Additionally, TACACS+ can also provide admin authorization services
- Control Plane Policing sets rate limit on control protocols to protect CPU overload from DOS attacks
- Supports multiple user authentication methods. Uses an IEEE 802.1X supplicant on the client in conjunction with a RADIUS server to authenticate in accordance with industry standards
- Web-based authentication provides a browser-based environment, similar to IEEE 802.1X, to authenticate clients that do not support IEEE 802.1X
- Supports MAC-based client authentication
- Concurrent IEEE 802.1X, Web, and MAC authentication schemes per switch port accepts up to 32 sessions of IEEE 802.1X, Web, and MAC authentications
- DHCP protection blocks DHCP packets from unauthorized DHCP servers, preventing denial-of-service attacks
- Secure management access delivers secure encryption of all access methods (CLI, GUI, or MIB) through SSHv2, SSL, and/or SNMPv3
- Switch CPU protection provides automatic protection against malicious network traffic trying to shut down the switch
- ICMP throttling defeats ICMP denial-of-service attacks by enabling any switch port to automatically throttle ICMP traffic
- Identity-driven ACL enables implementation of a highly granular and flexible access security policy and VLAN assignment specific to each authenticated network user
- STP BPDU port protection blocks Bridge Protocol Data Units (BPDUs) on ports that do not require BPDUs, preventing forged BPDU attacks
- Dynamic IP lockdown works with DHCP protection to block traffic from unauthorized hosts, preventing IP source address spoofing
- Dynamic ARP protection blocks ARP broadcasts from unauthorized hosts, preventing eavesdropping or theft of network data
- STP root guard protects the root bridge from malicious attacks or configuration mistakes
- Port security allows access only to specified MAC addresses, which can be learned or specified by the administrator
- MAC address lockout prevents particular configured MAC addresses from connecting to the network
- Source-port filtering allows only specified ports to communicate with each other
- Secure shell encrypts all transmitted data for secure remote CLI access over IP networks
- Secure Sockets Layer (SSL) encrypts all HTTP traffic, allowing secure access to the browser-based management GUI in the switch
- Secure FTP allows secure file transfer to and from the switch; protects against unwanted file downloads or unauthorized copying of a switch configuration file
- Critical Authentication Role ensures that important infrastructure devices such as IP phones are allowed network access even in the absence of a RADIUS server
- MAC Pinning allows non-chatty legacy devices to stay authenticated by pinning client MAC addresses to the port until the clients logoff or get disconnected

Standard Features

- Security banner displays a customized security policy when users log in to the switch
- RadSec enables RADIUS authentication and accounting data to be passed safely and reliably across insecure networks
- Private VLAN (PVLAN) provides traffic isolation between users on the same VLAN; typically a switch port can only communicate with other ports in the same community and/or an uplink port, regardless of VLAN ID or destination MAC address. This extends network security by restricting peer-peer communication to prevent variety of malicious attacks.
- Auto VLAN Creation automates VLAN creation on access switches for authenticated clients.
- DHCP smart relay allows the DHCP relay agent to use secondary IP addresses when the DHCP server does not reply the DHCP-OFFER message

Multicast

- IGMP Snooping allows multiple VLANs to receive the same IPv4 multicast traffic, lessening network bandwidth demand by reducing multiple streams to each VLAN
- Multicast Listener Discovery (MLD) enables discovery of IPv6 multicast listeners; supports MLD v1 and v2
- Protocol Independent Multicast (PIM) defines modes of IPv4 and IPv6 multicasting to allow one-to-many and many-to-many transmission of information; supports PIM Sparse Mode (SM), Source-Specific Multicast (SSM),and Dense Mode (DM) for both IPv4 and IPv6
- Internet Group Management Protocol (IGMP) utilizes Any-Source Multicast (ASM) to manage IPv4 multicast networks; supports IGMPv1, v2, and v3
- Multicast Service Discovery Protocol (MSDP) efficiently routes multicast traffic through core networks
- MSDP for Anycast RP is an intra-domain feature that provides redundancy and load-sharing capabilities

Convergence

- IP multicast routing includes PIM Sparse, Source-Specific Multicast, and Dense modes to route IP multicast traffic
- IP multicast snooping (data-driven IGMP) prevents flooding of IP multicast traffic
- Protocol Independent Multicast for IPv6 supports one-to- many and many-to-many media casting use cases such as IPTV over IPv6 networks
- LLDP-MED (Media Endpoint Discovery) defines a standard extension of LLDP that stores values for parameters such as QoS and VLAN to automatically configure network devices such as IP phones
- PoE allocations supports multiple methods (allocation by usage or class, with LLDP and LLDP-MED) to allocate PoE power for more efficient power management and energy savings
- Auto VLAN configuration for voice RADIUS VLAN uses a standard RADIUS attribute and LLDP-MED to automatically configure a VLAN for IP phones
- CDPv2 uses CDPv2 to configure legacy IP phones

Additional information

- Green initiative support for RoHS (EN 50581:2012) and WEEE regulations
- Compliant with DoDIN, APL, NDcPP, FIPS, and USGv6 requirements for federal certification.
- Azure Stack Integration supported
- TAA compliant models available

Customer first, customer last support

When your network is important to your business, then your business needs the backing of HPE Aruba Networking Support Services. Partner with HPE Aruba Networking product experts to increase your team productivity, keep pace with technology advances, software releases, and obtain break-fix support.

- Foundation Care for HPE Aruba Networking support services include priority access to HPE Aruba Networking Technical Assistance Center (TAC) engineers 24x7x365, flexible hardware and onsite support options, and total coverage for HPE Aruba Networking products. HPE Aruba Networking switches with assigned HPE Aruba Networking Central subscriptions benefit with option for additional hardware support only.
- HPE Aruba Networking Pro Care adds fast access to senior Aruba TAC engineers, who are assigned as a single point of contact for case management, reducing the time spent addressing and resolving issues.

Standard Features

For complete details on Foundation Care and HPE Aruba Networking Pro Care, please visit:
https://www.arubanetworks.com/supportservices/

Warranty, Services and Support

- Limited Lifetime Warranty, see **https://www.arubanetworks.com/support-services/ product-warranties/** for warranty and support information included with your product purchase
- For Software Releases and Documentation, refer to **https://asp.arubanetworks.com/downloads,**
- For more detailed information on HPE Aruba Networking AOS-CX software release and features, please visit the **AOS-CX Switch Software Documentation Portal**
- Explore and compare switch features for each platform and software release on the **HPE Aruba Networking Switch Feature Navigator**
- For support and services information, visit **https://www.arubanetworks.com/support-services/arubacare/**

Configuration Information

BTO Models

Rule #	Description	SKU
	6400 Bundle	
	HPE Aruba Networking CX 6405 v2 Switch	R0X26C
	• Aruba 6405 v2 Switch – 2 Management Module Slots – 5 Line Module Slots – 4 Power Supply Slots – 2 Fan Tray Slots • Includes 1x R0X24C Aruba 6405 Chassis • Includes 1x R0X31A Aruba 6400 Management Module with 1 open slot • Includes 2x R0X32A Aruba 6400 Fan Tray with no open slots • Must select Min 0 / Max 5 Line Modules • Must select Min 1 / Max 4 Power Supplies • 7U - Height	
	HPE Aruba Networking CX 6410 v2 Switch	R0X27C
	• Aruba 6410 v2 Switch – 2 Management Module Slots – 10 Line Module Slots – 4 Power Supply Slots – 4 Fan Tray Slots • Includes 1x R0X25C Aruba 6410 Chassis • Includes 1x R0X31A Aruba 6400 Management Module with 1 open slot • Includes 4x R0X32A Aruba 6400 Fan Tray with no open slots • Must select Min 0 / Max 10 Line Modules • Must select Min 1 / Max 4 Power Supplies • 12U - Height	
Notes:	– If ANY Option is integrated 0D1 to this Switch, then the Switch requires 0D1. (Box level integration is not allowed) – Locking Power Cord (JL335A) L6-20P is available through the Watson Accessories tab – OCA Only Model Selection Form, HPE Aruba Networking > Switches > HPE Aruba Networking OS > AOS-CX:> HPE Aruba Networking 6400 Switch Series	

Rack Level Integration CTO Models

Rule #	Description	SKU
	6400 Bundle	
	HPE Aruba Networking CX 6405 v2 Switch	R0X26C
	• Aruba 6405 v2 Switch – 2 Management Module Slots – 5 Line Module Slots – 4 Power Supply Slots – 2 Fan Tray Slots • Includes 1x R0X24C Aruba 6405 Chassis • Includes 1x R0X31A Aruba 6400 Management Module with 1 open slot • Includes 2x R0X32A Aruba 6400 Fan Tray with no open slots • Must select Min 0 / Max 5 Line Modules • Must select Min 1 / Max 4 Power Supplies • 7U - Height	

Configuration Information

HPE Aruba Networking CX 6410 v2 Switch R0X27C

- Aruba 6410 v2 Switch
  - 2 Management Module Slots
  - 10 Line Module Slots
  - 4 Power Supply Slots
  - 4 Fan Tray Slots
- Includes 1x R0X25C Aruba 6410 Chassis
- Includes 1x R0X31A Aruba 6400 Management Module with 1 open slot
- Includes 4x R0X32A Aruba 6400 Fan Tray with no open slots
- Must select Min 0 / Max 10 Line Modules
- Must select Min 1 / Max 4 Power Supplies
- 12U - Height

Notes:
- If the CTO Switch Sku needs to be racked, Then the CTO Base Model needs to integrate (with #0D1) to the HPE Network Rack.
- Locking Power Cord (JL335A) L6-20P is available through the OCA Accessories tab

Modules

Rule #	Description	SKU
	Redundant Management Module	
	For R0X26C, R0X27C System (std 1 // max 2) User Selection (min 0 // max 1) per Switch	
	HPE Aruba Networking CX 6400 Management Module	R0X31A
	Line Modules	
	For R0X26C, System (std 0 // max 5) User Selection (min 0 // max 5) per Switch	
	For R0X27C, System (std 0 // max 10) User Selection (min 0 // max 10) per Switch	
8, 9	HPE Aruba Networking CX 6400 48-port 1GbE Class 4 PoE v2 Module • No Optics compatible, Only Copper	R0X38C
1, 2, 3, 5, 8, 9	HPE Aruba Networking CX 6400 48-port 1GbE Class 4 PoE and 4-port SFP56 v2 Module • min=0 \ max=4 SFP/SFP+/SFP28/SFP56 1/10/25/50G Transceivers	R0X39C
1, 2, 3, 5, 8, 9	HPE Aruba Networking CX 6400 48-port 1GbE Class 6 PoE and 4-port SFP56 v2 Module • min=0 \ max=4 SFP/SFP+/SFP28/SFP56 1/10/25/50G Transceivers	R0X40C
1, 2, 3, 5, 8, 9	HPE Aruba Networking CX 6400 48p Smart Rate 1/2.5/5GbE Class6 PoE 4p SFP56 v2 Module • min=0 \ max=4 SFP/SFP+/SFP28/SFP56 1/10/25/50G Transceivers	R0X41C
1, 2, 3, 5, 8, 9	HPE Aruba Networking CX 6400 24-port 10Gbase-T and 4-port SFP56 v2 Module • min=0 \ max=4 SFP/SFP+/SFP28/SFP56 1/10/25/50G Transceivers	R0X42C
1, 2, 3, 5, 7, 8, 9	HPE Aruba Networking CX 6400 24-port SFP+ and 4-port SFP56 v2 Module • min=0 \ max=24 SFP/SFP+ 100M/1/10G Transceivers min=0 \ max=4 SFP/SFP+/SFP28/SFP56 1/10/25/50G Transceivers	R0X43C
1, 2, 3, 5, 7, 8, 9, 10, 11	HPE Aruba Networking CX 6400 48-port 1G/10G/25GbE SFP28 v2 Extended Tables Module • min=0 \ max=48 SFP/SFP+/SFP28 1/10/25G Transceivers or min=0 \ max=24 SFP56 50G Transceivers	R0X44C
4, 6, 8, 9	HPE Aruba Networking CX 6400 12-port 40/100GbE QSFP28 v2 Extended Tables Module • min=0 \ max=12 QSFP+/QSFP28 40/100G Transceivers	R0X45C
1, 2, 3, 4, 5, 6, 8, 9	HPE Aruba Networking CX 6400 32p 25G SFP28 4p 100G QSFP28 MACsec v2 Extended Tables Module • min=0 \ max=32 SFP/SFP+/SFP28 1/10/25G Transceivers • or min=0 \ max=16 SFP56 50G Transceivers • min=0 \ max=4 QSFP+/QSFP28 40/100G Transceivers	S0E48A
1, 2, 3, 5, 8, 9	HPE Aruba Networking CX 6400 24p Smart Rate 1G/2.5G/5G/10G Class8 PoE and 4p SFP56 v2 Module • min=0 \ max=4 SFP/SFP+/SFP28/SFP56 1/10/25/50G Transceivers	S1T83A

Configuration Information

Configuration Rules		
Rule #	**Description**	**SKU**
1	The following Transceivers install into this Module: (Use #0D1 quoted to module if module is CTO) - if applicable:	
	HPE Aruba Networking 1G SFP LC SX 500m OM2 MMF Transceiver	J4858D
	HPE Aruba Networking 1G SFP LC LX 10km SMF Transceiver	J4859D
	HPE Aruba Networking 1G SFP LC LH 70km SMF Transceiver	J4860D
	HPE Aruba Networking 1G SFP RJ45 T 100m Cat5e Transceiver	J8177D
	HPE Aruba Networking 1G SFP LC SX 500m MMF TAA Transceiver	JL745A
	HPE Aruba Networking 1G SFP LC LX 10km SMF TAA Transceiver	JL746A
	HPE Aruba Networking 1G SFP RJ45 T 100m Cat5e TAA Transceiver	JL747A
2	The following Transceivers install into this Module: (Use #0D1 quoted to module if module is CTO) - if applicable:	
	HPE Aruba Networking 10GBASE-T SFP+ RJ45 30m Cat6A Transceiver	JL563B
	HPE Aruba Networking 10G SFP+ LC SR 300m OM3 MMF Transceiver	J9150D
	HPE Aruba Networking 10G SFP+ LC LR 10km SMF Transceiver	J9151E
	HPE Aruba Networking 10G SFP+ LC ER 40km SMF Transceiver	J9153D
	HPE Aruba Networking 10G SFP+ LC SR 300m MMF TAA Transceiver	JL748A
	HPE Aruba Networking 10G SFP+ LC LR 10km SMF TAA Transceiver	JL749A
	HPE Aruba Networking 10G SFP+ to SFP+ 1m Direct Attach Copper Cable	J9281D
	HPE Aruba Networking 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	J9283D
3	The following Transceivers install into this Module: (Use #0D1 quoted to module if module is CTO) - if applicable:	
	HPE Aruba Networking 25G SFP28 LC SR 100m MMF Transceiver	JL484A
	HPE Aruba Networking 25G SFP28 LC eSR 400m MMF Transceiver	JL485A
	HPE Aruba Networking 25G SFP28 LC LR 10km SMF Transceiver	JL486A
	HPE Aruba Networking 25G SFP28 to SFP28 0.65m Direct Attach Cable	JL487A
	HPE Aruba Networking 25G SFP28 to SFP28 3m Direct Attach Copper Cable	JL488A
	HPE Aruba Networking 25G SFP28 to SFP28 5m Direct Attach Copper Cable	JL489A
	HPE Aruba Networking 25G ER LC 40km SMF Transceiver	S0V69A
	HPE Aruba Networking 25G BiDi 10km-Downstream 1330/1270 Transceiver	S1C96A
	HPE Aruba Networking 25G BiDi 10km-Upstream 1270/1330 Transceiver	S1C98A
4	The following Transceivers install into this Module: (Use #0D1 quoted to module if module is CTO) - if applicable:	
	HPE Aruba Networking 40G QSFP+ LC ER4 40km SMF Transceiver	Q9G82A
	HPE Networking X142 40G QSFP+ MPO SR4 Transceiver	JH231A
	HPE Networking X142 40G QSFP+ LC LR4 SM Transceiver	JH232A
	HPE Networking X142 40G QSFP+ MPO eSR4 300M Transceiver	JH233A
	HPE Aruba Networking 40G QSFP+ LC Bidirectional 150m MMF 2-strand Transceiver	JL308A
	HPE Networking X242 40G QSFP+ to QSFP+ 1m Direct Attach Copper Cable	JH234A
	HPE Networking X242 40G QSFP+ to QSFP+ 3m Direct Attach Copper Cable	JH235A
	HPE Networking X242 40G QSFP+ to QSFP+ 5m Direct Attach Copper Cable	JH236A
5	The following Transceivers install into this Module: (Use #0D1 quoted to switch if module is CTO) - if applicable:	
	HPE Aruba Networking 50G SFP56 to SFP56 0.65m Direct Attach Copper Cable	R0M46A
	HPE Aruba Networking 50G SFP56 to SFP56 3m Direct Attach Copper Cable	R0M47A
	HPE Aruba Networking 50G SFP56 LC SR 100m MMF Transceiver	R0M48A
	HPE Aruba Networking 50G eSR 300m MMF Transceiver	S0V64A
	HPE Aruba Networking 50G LR 10km SMF Transceiver	S0V65A
	HPE Aruba Networking 50G ER 40km SMF Transceiver	S0V66A
	HPE Aruba Networking 50G BiDi 10km-Downstream 1330/1270 Transceiver	S1C92A
	HPE Aruba Networking 50G BiDi 10km-Upstream 1270/1330 Transceiver	S1C94A

Configuration Information

6	The following Transceivers install into this Module: (Use #0D1 quoted to module if module is CTO) - if applicable:	
	HPE Aruba Networking 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable	JL307A
	HPE Aruba Networking 100G QSFP28 MPO SR4 100m 12-fiber MPO OM3 MMF Transceiver	JL309A
	HPE Aruba Networking 100G QSFP28 LC LR4 10km SMF 2-strand Transceiver	JL310A
	HPE Aruba Networking 100G QSFP28 LC CWDM4 2km SMF Transceiver	R0Z30A
	HPE Aruba Networking 100G SR2 MPO QSFP28 100m MMF Transceiver	S1C93A
	HPE Aruba Networking 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable	R0Z25A
	HPE Aruba Networking 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable	R0Z26A
7	The following Transceivers install into this Module: (Use #0D1 quoted to module if module is CTO) - if applicable:	
	HPE Aruba Networking 100M SFP LC FX 2km MMF Transceiver	J9054D
8	This Module is compatible with the following 10 Slot Switch Bundles:	
	HPE Aruba Networking CX 6410 v2 Switch	R0X27C
9	This Module is compatible with the following 5 Slot Switch Bundles:	
	HPE Aruba Networking CX 6405 v2 Switch	R0X26C
10	The following Transceivers install into this Module:(Use #0D1 quoted to module if module is CTO) - if applicable:	
	HPE Aruba Networking 10G SMF Simplex LC BiDi 40km-Downstream 1330/1270 Transceiver	R9X54A
	HPE Aruba Networking 10G SMF Simplex LC BiDi 40km-Upstream 1270/1330 Transceiver	R9X55A
11	For R0X44C, 50G is only supported in the lower SFP56 ports and use of a 50G optic in 1 lower port will disable all upper ports in the corresponding port group. Port groups are as follows: Group 1 = Ports 1-12 Group 2-7 = Ports 13-16; 17-20; 21-24; 25-28; 29-32; 33-36 Group 8 = Ports 37-48	

Transceivers

Remarks:	Description	SKU
	SFP Transceivers	
	HPE Aruba Networking 100M SFP LC FX 2km MMF Transceiver	J9054D
Notes:	Not supported on SFP56 Ports	
	HPE Aruba Networking 1G SFP LC SX 500m OM2 MMF Transceiver	J4858D
	HPE Aruba Networking 1G SFP LC LX 10km SMF Transceiver	J4859D
	HPE Aruba Networking 1G SFP LC LH 70km SMF Transceiver	J4860D
	HPE Aruba Networking 1G SFP RJ45 T 100m Cat5e Transceiver	J8177D
	HPE Aruba Networking 1G SFP LC SX 500m MMF TAA Transceiver	JL745A
	HPE Aruba Networking 1G SFP LC LX 10km SMF TAA Transceiver	JL746A
	HPE Aruba Networking 1G SFP RJ45 T 100m Cat5e TAA Transceiver	JL747A
	SFP+ Transceivers	
	HPE Aruba Networking 10GBASE-T SFP+ RJ45 30m Cat6A Transceiver	JL563B
	HPE Aruba Networking 10G SFP+ LC SR 300m OM3 MMF Transceiver	J9150D
	HPE Aruba Networking 10G SFP+ LC LR 10km SMF Transceiver	J9151E
	HPE Aruba Networking 10G SFP+ LC ER 40km SMF Transceiver	J9153D
	HPE Aruba Networking 10G SFP+ LC SR 300m MMF TAA Transceiver	JL748A
	HPE Aruba Networking 10G SFP+ LC LR 10km SMF TAA Transceiver	JL749A
	HPE Aruba Networking 10G SFP+ to SFP+ 1m Direct Attach Copper Cable	J9281D
	HPE Aruba Networking 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	J9283D
	HPE Aruba Networking 10G SMF Simplex LC BiDi 40km-Downstream 1330/1270 Transceiver	R9X54A
	HPE Aruba Networking 10G SMF Simplex LC BiDi 40km-Upstream 1270/1330 Transceiver	R9X55A
	SFP28 Transceivers	
	HPE Aruba Networking 25G ER LC 40km SMF Transceiver	S0V69A
	• All modules/Ports that support 25G • NOT R0X43C: 1-24	

Configuration Information

- NO QSA28 support

HPE Aruba Networking 25G BiDi 10km-Downstream 1330/1270 Transceiver S1C96A
- All modules/Ports that support 25G
- NOT R0X43C: 1-24
- NO QSA28 support

HPE Aruba Networking 25G BiDi 10km-Upstream 1270/1330 Transceiver S1C98A
- All modules/Ports that support 25G
- NOT R0X43C: 1-24
- NO QSA28 support

HPE Aruba Networking 25G SFP28 LC SR 100m MMF Transceiver JL484A
HPE Aruba Networking 25G SFP28 LC eSR 400m MMF Transceiver JL485A
HPE Aruba Networking 25G SFP28 LC LR 10km SMF Transceiver JL486A
HPE Aruba Networking 25G SFP28 to SFP28 0.65m Direct Attach Cable JL487A
HPE Aruba Networking 25G SFP28 to SFP28 3m Direct Attach Copper Cable JL488A
HPE Aruba Networking 25G SFP28 to SFP28 5m Direct Attach Copper Cable JL489A

QSFP+ Transceivers

HPE Aruba Networking 40G QSFP+ LC ER4 40km SMF Transceiver Q9G82A
HPE Networking X142 40G QSFP+ MPO SR4 Transceiver JH231A
HPE Networking X142 40G QSFP+ LC LR4 SM Transceiver JH232A
HPE Networking X142 40G QSFP+ MPO eSR4 300M Transceiver JH233A
HPE Networking X242 40G QSFP+ to QSFP+ 1m Direct Attach Copper Cable JH234A
HPE Networking X242 40G QSFP+ to QSFP+ 3m Direct Attach Copper Cable JH235A
HPE Networking X242 40G QSFP+ to QSFP+ 5m Direct Attach Copper Cable JH236A
HPE Aruba Networking 40G QSFP+ LC Bidirectional 150m MMF 2-strand Transceiver JL308A

SFP56 Transceivers

HPE Aruba Networking 50G SFP56 to SFP56 0.65m Direct Attach Copper Cable R0M46A
HPE Aruba Networking 50G SFP56 to SFP56 3m Direct Attach Copper Cable R0M47A
HPE Aruba Networking 50G SFP56 LC SR 100m MMF Transceiver R0M48A

Notes: For R0X44C Module; ports 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48 are valid

HPE Aruba Networking 50G eSR 300m MMF Transceiver S0V64A
- All modules/Ports that support 50G
- YES R0X44C: Even# ports
- NO QSA28 support

HPE Aruba Networking 50G LR 10km SMF Transceiver S0V65A
- All modules/Ports that support 50G
- YES R0X44C: Even# ports
- NO QSA28 support

HPE Aruba Networking 50G ER 40km SMF Transceiver S0V66A
- All modules/Ports that support 50G
- YES R0X44C: Even# ports
- NO QSA28 support

HPE Aruba Networking 50G BiDi 10km-Downstream 1330/1270 Transceiver S1C92A
- All modules/Ports that support 50G
- YES R0X44C: Even# ports
- NO QSA28 support

HPE Aruba Networking 50G BiDi 10km-Upstream 1270/1330 Transceiver S1C94A
- All modules/Ports that support 50G
- YES R0X44C: Even# ports
- NO QSA28 support

Configuration Information

QSFP28 Transceivers

HPE Aruba Networking 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable	JL307A
HPE Aruba Networking 100G QSFP28 MPO SR4 100m 12-fiber MPO OM3 MMF Transceiver	JL309A
HPE Aruba Networking 100G QSFP28 LC LR4 10km SMF 2-strand Transceiver	JL310A
HPE Aruba Networking 100G QSFP28 LC CWDM4 2km SMF Transceiver	R0Z30A
HPE Aruba Networking 100G SR2 MPO QSFP28 100m MMF Transceiver	S1C93A
HPE Aruba Networking 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable	R0Z25A
HPE Aruba Networking 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable	R0Z26A

Power Supplies

Remarks	Description	SKU
1, 2	HPE Aruba Networking CX 6400 1800W Power Supply with C16 Inlet Accessory	R0X35A
	• Uses 1 x C15, 1800w	
	HPE Aruba Networking CX 6400 1800W Power Supply with C16 Inlet Accessory PDU	R0X35A#B2B
	• C15 PDU Jumper Cord (NA/MEX/TW/JP) (J9943A)	
	HPE Aruba Networking CX 6400 1800W Power Supply with C16 Inlet Accessory PDU	R0X35A#B2C
	• C15 PDU Jumper Cord (ROW) (J9944A)	
	HPE Aruba Networking CX 6400 1800W Power Supply with C16 Inlet Accessory 220v	R0X35A#B2E
	• HPE 2.5m C15 to NEMA 6-20P Pwr Cord(JL336A)	
	HPE Aruba Networking CX 6400 1800W Power Supply with C16 Inlet Accessory NoLoc	R0X35A#AC3
	• No Localized Power Cord Selected. Use J9955A to obtain a Locking Plug Power Cord (L6-20P)	
1, 2	HPE Aruba Networking CX 6400 3000W Power Supply with C20 Inlet Accessory	R0X36A
	• Uses 1 x C19, 3000w	
Notes:	Localization (Wall Power Cord) required on orders without #B2B, #B2C, (PDU Power Cord) or #B2E. (See Localization Menu)	
	HPE Aruba Networking CX 6400 3000W Power Supply with C20 Inlet Accessory PDU	R0X36A#B2B
	• C19 to C20 PDU Jumper Cord (NA/MEX/TW/JP) (JL342A)	
	HPE Aruba Networking CX 6400 3000W Power Supply with C20 Inlet Accessory PDU	R0X36A#B2C
	• C19 to C20 PDU Jumper Cord (ROW) (JL342A)	
	HPE Aruba Networking CX 6400 3000W Power Supply with C20 Inlet Accessory 220v	R0X36A#B2E
	• HPE 2.5m C19 to NEMA 6-20P Pwr Cord(JL351A)	
	HPE Aruba Networking CX 6400 3000W Power Supply with C20 Inlet Accessory NoLoc	R0X36A#AC3
	• No Localized Power Cord Selected. Use JL335A to obtain a Locking Plug Power Cord (L6-20P)	

Configuration Rules

Rule #	Description	SKU
1	Localization (Wall Power Cord) required on orders without #B2B, #B2C, #B2E(PDU Power Cord) or #AC3. (See Localization Menu)	
2	Unbuildable/FAN required, generates CFGU: If order is quoted for India and contains "#B2C" Option, then Display the following:	
	• For BTO shipments to India: Please replace <Base Model>#B2C option with <Base Model>#AC3 in the Bill of Materials and add the appropriate INDIA PDU Power Cord below via Ad-Hoc: JL671A - HPE 2.0m C13 to C14 PDU IN Power Cord JL672A - HPE 2.5m C15 to C14 PDU IN Power Cord JL673A - HPE 2.5m C19 to C20 PDU IN Power Cord For Factory Integration of Power Cord, please add "#0D1" to the Power Cord Sku suffix. (Ex. JL671A#0D1)	
Notes:	– Drop down under power supply should offer the following options and results: ○ Switch/Router to PDU Power Cord - #B2B in NA, Mexico, Taiwan, and Japan or #B2C ROW. (OCA Default B2B or B2C for Rack Level CTO)	

Configuration Information

- Switch/Router/Power Supply to Wall Power Cord - Localized Option (OCA Default for BTO and Box Level CTO)
- High Volt Switch/Router/Power Supply to Wall Power Cord - #B2E Option. (Offered only in North America, Mexico, Taiwan, and Japan)
- No Localized Power Cord Selected - #AC3 Option

– Locking Power Cord (J9955A(C15) or JL335A(C19)) L6-20P is available through the Watson Accessories tab

India PDU Cable

For R0X35A, R0X36A (std 0 // max 1) User Selection (min 0 // max 1) per enclosure

Remarks	Description	SKU
	HPE Networking 2.5m C15 to C14 PDU India Power Cord	JL672A
	• C15 India PDU Cable for Factory Racked Systems Only	
	HPE Networking 2.5m C19 to C20 PDU India Power Cord	JL673A
	• C19 India PDU Cable for Factory Racked Systems Only	
Notes:	These cables are intended for India use only. Typically power cord is ordered when power supply option #AC3 is selected.	

Switch Options

Rack Mount Kits

System (std 0 // max 1) User Selection (min 0 // max 1) per enclosure

	HPE Aruba Networking CX 6400 4-post Rack Mount Kit	R0X37A
Notes:	If the switch will be factory racked into an HPE Universal Rack, then (Min 1) of the 4 Post Rack Mount kit is required.	

Accessories

Spares

System (std 0 // max 99) User Selection (min 0 // max 99) per enclosure

HPE Aruba Networking 6400 CX Fan Tray	R0X32A
HPE Aruba Networking X2C2 RJ45 to DB9 Console Cable	JL448A
HPE Aruba Networking USBA-RJ45 PIN3TX-6RX 2.5m Cable	R8Z87A
HPE Aruba Networking USBA-RJ45 PC-to-Switch PIN6TX-3RX 2.5m Cable	R9G48B
HPE Aruba Networking USB-A reversible to USB-C PC-to-Switch 3m Cable	R9J32A
HPE Aruba Networking USB-C to USB-C PC-to-Switch 3m Cable	R9J33A
HPE Aruba Networking CX Switch Bluetooth Adapter	S1H23A

Software

Remarks	Description	SKU
	HPE Aruba Networking OS-CX Software	
	CX Advanced Software Licenses	
	HPE Aruba Networking CX Software 64xx Switch Advanced 1-year Subscription E-STU	S0T82AAE
	HPE Aruba Networking CX Software 64xx Switch Advanced 3-year Subscription E-STU	S0T83AAE
	HPE Aruba Networking CX Software 64xx Switch Advanced 5-year Subscription E-STU	S0T84AAE
	HPE Aruba Networking CX Software 64xx Switch Advanced 7-year Subscription E-STU	S0T85AAE
	HPE Aruba Networking CX Software 64xx Switch Advanced 10-year Subscription E-STU	S0T81AAE
	HPE Aruba Networking Central	
Notes:	For details and complete listing of HPE Aruba Networking Central licensing options, please see **https://www.arubanetworks.com/assets/ds/DS_ArubaCentral.pdf** and HPE Aruba Networking Central Data Sheet **https://www.arubanetworks.com/assets/ds/DS_ArubaCentral.pdf**	
	Cloud Services / 64XX/54XX Switch Foundation Subscriptions	
2	HPE Aruba Networking Central Switch Class-4 Foundation 1 year Subscription E-STU	R8L80AAE
2	HPE Aruba Networking Central Switch Class-4 Foundation 3 year Subscription E-STU	R8L81AAE
2	HPE Aruba Networking Central Switch Class-4 Foundation 5 year Subscription E-STU	R8L82AAE
2	HPE Aruba Networking Central Switch Class-4 Foundation 7 year Subscription E-STU	R8L83AAE
2	HPE Aruba Networking Central Switch Class-4 Foundation 10 year Subscription E-STU	R8L84AAE

Configuration Information

	On-Prem Services / 64XX/54XX Switch Advanced Subscriptions	
3	Aruba Central On-Premises 64xx/54xx Switch Advanced 1year Subscription E-STU	S0T55AAE
3	Aruba Central On-Premises 64xx/54xx Switch Advanced 3 year Subscription E-STU	S0T58AAE
3	Aruba Central On-Premises 64xx/54xx Switch Advanced 5 year Subscription E-STU	S0T60AAE
3	Aruba Central On-Premises 64xx/54xx Switch Advanced 7 year Subscription E-STU	S0T62AAE
3	Aruba Central On-Premises 64xx/54xx Switch Advanced 10 year Subscription E-STU	S0T64AAE
	On-Prem Services / 64XX/54XX Switch Foundation Subscriptions	
3	HPE Aruba Networking Central on Prem Switch Class-4 Foundation 1 year Subscription E-STU	R8M10AAE
3	HPE Aruba Networking Central on Prem Switch Class-4 Foundation 3 year Subscription E-STU	R8M11AAE
3	HPE Aruba Networking Central on Prem Switch Class-4 Foundation 5 year Subscription E-STU	R8M12AAE
3	HPE Aruba Networking Central on Prem Switch Class-4 Foundation 7 year Subscription E-STU	R8M13AAE
3	HPE Aruba Networking Central on Prem Switch Class-4 Foundation 10 year Subscription E-STU	R8M14AAE
	Configuration Rules	
Rule #	**Description**	**SKU**
2	Add the Central Cloud Skus to the Aruba Catalog as Standalone: Aruba > Network Management > Central > Cloud Services	
3	Add the Central On-Prem Skus to the Aruba Catalog as Standalone: Aruba > Network Management > Central > On-Prem Services	
	Composer	
	Single Node Subscription	
	HPE Aruba Networking Fabric Composer Device Management Service Tier 4 Switch 1y Subscription E-STU	R7G99AAE
	HPE Aruba Networking Fabric Composer Device Management Service Tier 4 Switch 3y Subscription E-STU	R7H00AAE
	HPE Aruba Networking Fabric Composer Device Management Service Tier 4 Switch 5y Subscription E-STU	R7H01AAE

As-a-Service

	HPE Aruba Networking Central	
	Cloud Services / Switch Advanced AAS Licenses	
	HPE Aruba Networking Central Switch Class-4 Advanced 1 year Subscription SaaS	S0W57AAS
	HPE Aruba Networking Central Switch Class-4 Advanced 3 year Subscription SaaS	S0W58AAS
	HPE Aruba Networking Central Switch Class-4 Advanced 5 year Subscription SaaS	S0W59AAS
	HPE Aruba Networking Central Switch Class-4 Advanced 7 year Subscription SaaS	S0W60AAS
	HPE Aruba Networking Central Switch Class-4 Advanced 10 year Subscription SaaS	S0W61AAS
	HPE Aruba Networking Central Switch Class-4 Advanced 1 year Subscription SaaS	S0W82AAS
	HPE Aruba Networking Central Switch Class-4 Advanced 3 year Subscription SaaS	S0W83AAS
	HPE Aruba Networking Central Switch Class-4 Advanced 5 year Subscription SaaS	S0W84AAS
	HPE Aruba Networking Central Switch Class-4 Advanced 7 year Subscription SaaS	S0W85AAS
	HPE Aruba Networking Central Switch Class-4 Advanced 10 year Subscription SaaS	S0W86AAS
Notes:	For IRIS reference only. No action required for OCX and Clic	

Technical Specifications

HPE Aruba Networking 6405 Switch (R0X26A)		
Description	1x 6405 Chassis (R0X24A) 1x Management Module (R0X31A) 2x Fan Trays (R0X32A) 5 open module slots	
	Power supply units ordered separately.	
	Supports any of the following line cards in the open slots: R0X38B, R0X39B, R0X40B, R0X41A, R0X42A, R0X43A, R0X44A, R0X45A, R0X44C, R0X45C	
	Supports PoE standards IEEE 802.3af, 802.3at, 802.3bt (up to 60W)	
Additional Ports and Slots	1x RJ-45 console port 1x USB-C console port 1x OOBM 1x USB Type A host port 1x Bluetooth dongle to be used with CX Mobile App	
Power Supplies	Supports four modular front-serviceable power supplies with removable rear-serviceable power cord inlet adapters.	
	Supported power supplies: R0X35A, R0X36A. PoE available will be dependent on the number of management modules, line cards, fan trays and the number of power supplies used. Power supplies not included; order separately.	
Fan Tray	Two field replaceable system fan trays	
Physical Characteristics	**Dimensions**	17.5 (w) x 17.7 (d) x 12.1 (h) in (44.26 x 44.85 cm x 30.66 cm)
	Weight	64.7 lbs (29.3 kg)
Mounting and Enclosure	Cable management kit included. 2-post rack mounting kit included. 4-post rack mounting kit available separately	
CPU	Management Module: Quad Core ARM Cortex™ A72 @ 1.8GHz Line Card: Dual Core ARM Cortex™ A72 @ 1.8GHz	
Memory and Flash	Management Module: 16GB DDR4 ECC memory; 32GB eMMC Flash memory Line Card: 4GB DDR4 memory	
Packet Buffer	R0X38B-R0X43A Line Cards: 8MB packet buffer memory per line card R0X44A-R0X45A Line Cards: 32MB packet buffer memory per line card	
Performance	**System switching capacity**	14 Tbps
	System throughput capacity	5.7 Bpps
	Average latency (LIFO-64-bytes packets)	1G: 5.32 µSec 10G: 1.48 µSec 25G: 2.78 µSec 40G: 1.31 µSec 100G: 1.42 µSec
	Switched virtual interfaces (dual stack)	2,048
	IPv4 host table (ARP)	49,152; Up to 163,840 for R0X44C and R0X45C[2]
	Ipv6 host table (ND)	49,152; Up to 163,840 R0X44C and R0X45C[2]
	Ipv4 unicast routes	61,000; Up to 630,780 R0X44C and R0X45C[2]
	Ipv6 unicast routes	61,000; Up to 598014 R0X44C and R0X45C[2]
	Notes: [2]R0X44C and R0X45C increased scale requires all line cards to be R0X44C/R0X45C – any inclusion of other line cards will reduce scale to original values.	
	Ipv4 multicast routes	8,192
	Ipv6 multicast routes	8,192
	MAC table capacity	32,768
	IGMP groups	8,192
	MLD groups	8,192

Technical Specifications

Performance	**Ipv4/Ipv6/MAC ACL entries (ingress)**	64,000 / 16,384 / 64,000 per line card for R0X44A/R0X44C and R0X45A/R0X45C; 20,480/5,120/20,480 per line card for all other line cards
	Ipv4/Ipv6/MAC ACL entries (Egress)	64,000 / 16,384 / 64,000 per line card for R0X44A/R0X44C and R0X45A/R0X45C; 8,192/2,048/8,192 per line card for all other line cards
	VRF	256
Environment	**Operating temperature**	32° to 113°F (0° to 45°C), up to 5,000 feet 32° to 104°F (0° to 40°C), 5,001 to 10,000 feet 1°C de-rating per 1,000 feet above 5,000 feet
	Operating humidity	15% to 95% relative humidity at 113°F (45°C), non-condensing
	Non-operating temperature	-40° to 158°F (-40° to 70°C)
	Non-operating humidity	15% to 95% relative humidity at 149°F(65°C), non-condensing
	Max operating altitude	Up to 10,000ft (3.048 Km)
	Max non-operating altitude	Up to 10,000ft (3.048 Km)
Acoustics	Sound power (LWAd): 6.6 Bel Sound pressure (LpAm, bystander): 46.6 dB when tested with 2 x 1800W PSU (R0X35A), 2 x fan trays, 370W of PoE and traffic on all ports Sound power (LWAd): 6.5 Bel Sound pressure (LpAm, bystander): 46.3 dB when tested with 2 x 3000W PSU (R0X36A), 2 x fan trays, 370W of PoE and traffic on all ports	
Primary airflow	Front-to-back	
Electrical Characteristics	**Frequency**	50-60 Hz
	AC voltage	R0X35A and R0X36A PSUs: 110-127 / 200-240VAC
	Current	R0X35A PSU: 12A @ 110-127VAC, 10A @ 200-240VAC R0X36A PSU: 16A @ 110-240VAC
	Power output	R0X35A PSU: 1800W @ 200-240VAC, 1100W @ 110-127VAC R0X36A PSU: 3000W @ 200-240VAC, 1500W @ 110-127VAC
Safety	EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 +A2:2013; EN62368-1:2014; IEC 60950-1:2005 Ed.2; AM 1:2009+A2:2013; IEC 62368-1 Ed. 2; IEC 60825:2007 (Applies to products with lasers); UL 60950-1, CSA 22.2 No 60950-1; UL 62368-1 Ed. 2	
Emissions	VCCI Class A; EN 55022 Class A; CISPR 22 Class A; IEC/EN 61000-3-2; IEC/EN 61000-3-3; ICES-003 Class A; AS/NZS CISPR 22 Class A; FCC (CFR 47, Part 15) Class A; GB9254; EN55032:2012 Class A; CISPR32:2012 Class A	
Immunity	**Generic**	Directive 2014/35/EU
	EN	EN 55024:2010 +A1:2001 +A2:2003; ETSI EN 300 386 V1.3.3
	ESD	EN 61000-4-2
	Radiated	EN 61000-4-3
	EFT/Burst	EN 61000-4-4
	Surge	EN 61000-4-5
	Conducted	EN 61000-4-6
	Power Frequency Magnetic Field	IEC 61000-4-8
	Voltage Dips and Interruptions	EN 61000-4-11
	Harmonics	EN 61000-3-2, IEC 61000-3-2
	Flicker	EN 61000-3-3, IEC 61000-3-3

Technical Specifications

HPE Aruba Networking 6410 Switch (R0X27A)		
Description	1x 6410 Chassis (R0X25A) 1x Management Module (R0X31A) 4x Fan Trays (R0X32A) 10 open module slots	
	Power supply units ordered separately.	
	Supports any of the following line cards in the open slots: R0X38B, R0X39B, R0X40B, R0X41A, R0X42A, R0X43A, R0X44A, R0X45A, R0X44C, R0X45C	
	Supports PoE standards IEEE 802.3af, 802.3at, 802.3bt (up to 60W)	
Additional Ports and Slots	1x RJ-45 console port 1x USB-C console port 1x OOBM 1x USB Type A host port 1x Bluetooth dongle to be used with CX Mobile App	
Power Supplies	Supports four modular front-serviceable power supplies with removable rear-serviceable power cord inlet adapters.	
	Supported power supplies: R0X35A, R0X36A. PoE available will be dependent on the number of management modules, line cards, fan trays and the number of power supplies used. Power supplies not included; order separately.	
Fan Tray	Four field replaceable system fan trays	
Physical Characteristics	**Dimensions**	17.5 (w) x 17.7 (d) x 20.8 (h) in (44.26 x 44.85 x 52.88 cm)
	Weight	118.2 lbs (53.5 kg)
Mounting and Enclosure	Cable management kit included. 2-post rack mounting kit included. 4-post rack mounting kit available separately	
CPU	Management Module: Quad Core ARM Cortex™ A72 @ 1.8GHz Line Card: Dual Core ARM Cortex™ A72 @ 1.8GHz	
Memory and Flash	Management Module: 16GB DDR4 ECC memory; 32GB eMMC Flash memory Line Card: 4GB DDR4 memory	
Packet Buffer	R0X38B-R0X43A Line Cards: 8MB packet buffer memory per line card R0X44A-R0X45A Line Cards: 32MB packet buffer memory per line card	
Performance	**System switching capacity**	28 Tbps
	System throughput capacity	11.4 Bpps
	Average latency (LIFO-64-bytes packets)	1G: 5.32 µSec 10G: 1.48 µSec 25G: 2.78 µSec 40G: 1.31 µSec 100G: 1.42 µSec
	Switched virtual interfaces (dual stack)	2,048
	IPv4 host table (ARP)	49,152; Up to 163,840 for R0X44C and R0X45C[2]
	IPv6 host table (ND)	49,152; Up to 163,840 R0X44C and R0X45C[2]
	IPv4 unicast routes	61,000; Up to 630,780 R0X44C and R0X45C[2]
	IPv6 unicast routes	61,000; Up to 598014 R0X44C and R0X45C[2]
	Notes: [2]R0X44C and R0X45C increased scale requires all line cards to be R0X44C/R0X45C – any inclusion of other line cards will reduce scale to original values.	
	IPv4 multicast routes	8,192
	IPv6 multicast routes	8,192
	MAC table capacity	32,768
	IGMP groups	8,192
	MLD groups	8,192

Technical Specifications

Performance	**IPv4/IPv6/MAC ACL entries (ingress)**	64,000 / 16,384 / 64,000 per line card for R0X44A/R0X44C and R0X45A/R0X45C; 20,480/5,120/20,480 per line card for all other line cards
	IPv4/IPv6/MAC ACL entries (Egress)	64,000 / 16,384 / 64,000 per line card for R0X44A/R0X44C and R0X45A/R0X45C; 8,192/2,048/8,192 per line card for all other line cards
	VRF	256
Environment	**Operating temperature**	32° to 113°F (0° to 45°C), up to 5,000 feet 32° to 104°F (0° to 40°C), 5,001 to 10,000 feet 1°C de-rating per 1,000 feet above 5,000 feet
	Operating humidity	15% to 95% relative humidity at 113°F (45°C), non-condensing
	Non-operating temperature	-40° to 158°F (-40° to 70°C)
	Non-operating humidity	15% to 95% relative humidity at 149°F(65°C), non-condensing
	Max operating altitude	Up to 10,000ft (3.048 Km)
	Max non-operating altitude	Up to 10,000ft (3.048 Km)
Acoustics	Sound power (LWAd): 6.8 Bel Sound pressure (LpAm, bystander): 48.8 dB when tested with 2 x 1800W PSU (R0X35A), 4 x fan trays, 370W of PoE and traffic on all ports Sound power (LWAd): 6.8 Bel Sound pressure (LpAm, bystander): 48.9 dB when tested with 2 x 3000W PSU (R0X36A), 4 x fan trays, 370W of PoE and traffic on all ports	
Primary airflow	Front-to-back	
Electrical Characteristics	**Frequency**	50-60 Hz
	AC voltage	R0X35A and R0X36A PSUs: 110-127 / 200-240VAC
	Current	R0X35A PSU: 12A @ 110-127VAC, 10A @ 200-240VAC R0X36A PSU: 16A @ 110-240VAC
	Power output	R0X35A PSU: 1800W @ 200-240VAC, 1100W @ 110-127VAC R0X36A PSU: 3000W @ 200-240VAC, 1500W @ 110-127VAC
Safety	EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 +A2:2013; EN62368-1:2014; IEC 60950-1:2005 Ed.2; AM 1:2009+A2:2013; IEC 62368-1 Ed. 2; IEC 60825:2007 (Applies to products with lasers); UL 60950-1, CSA 22.2 No 60950-1; UL 62368-1 Ed. 2	
Emissions	VCCI Class A; EN 55022 Class A; CISPR 22 Class A; IEC/EN 61000-3-2; IEC/EN 61000-3-3; ICES-003 Class A; AS/NZS CISPR 22 Class A; FCC (CFR 47, Part 15) Class A; GB9254; EN55032:2012 Class A; CISPR32:2012 Class A	
Immunity	**Generic**	Directive 2014/35/EU
	En	EN 55024:2010 +A1:2001 +A2:2003; ETSI EN 300 386 V1.3.3
	ESD	EN 61000-4-2
	Radiated	EN 61000-4-3
	EFT/Burst	EN 61000-4-4
	Surge	EN 61000-4-5
	Conducted	EN 61000-4-6
	Power Frequency Magnetic Field	IEC 61000-4-8
	Voltage Dips and Interruptions	EN 61000-4-11
	Harmonics	EN 61000-3-2, IEC 61000-3-2
	Flicker	EN 61000-3-3, IEC 61000-3-3

Technical Specifications

HPE Aruba Networking 6405 96G CL4 PoE 4SFP56 Switch (R0X29A)		
Description	1x 6405 Chassis (R0X24A) 1x Management Module (R0X31A) 2x Fan Trays (R0X32A) 1x R0X38B Line Card 1x R0X39B Line Card	
	Supports any of the following line cards in the open slots: R0X38B, R0X39B, R0X40B, R0X41A, R0X42A, R0X43A, R0X44A, R0X45A, R0X44C, R0X45C	
	96x 10/100/1000BASE-T PoE+ Ports supporting up to 30W per port	
	4x 1GbE/10GbE/25GbE/50GbE[1] SFP ports **Notes:** [1]50GbE capability is for use with 50G DACs for both interconnect and HPE Aruba Networking VSX. 50GbE transceiver capability enabled by future software release.	
	Supports PoE standards IEEE 802.3af, 802.3at, 802.3bt (up to 60W)	
Additional Ports and Slots	1x RJ-45 console port 1x USB-C console port 1x OOBM 1x USB Type A host port 1x Bluetooth dongle to be used with CX Mobile App	
Power Supplies	Supports four modular front-serviceable power supplies with removable rear-serviceable power cord inlet adapters.	
	Supported power supplies: R0X35A, R0X36A. PoE available will be dependent on the number of management modules, line cards, fan trays and the number of power supplies used. Power supplies not included; order separately.	
Fan tray	Two field replaceable system fan trays	
Physical Characteristics	**Dimensions**	17.5 (w) x 17.7 (d) x 12.1 (h) in (44.26 x 44.85 cm x 30.66 cm)
	Weight	75.2 lbs (34.1 kg)
Mounting and Enclosure	Cable management kit included. 2-post rack mounting kit included. 4-post rack mounting kit available separately	
CPU	Management Module: Quad Core ARM Cortex™ A72 @ 1.8GHz Line Card: Dual Core ARM Cortex™ A72 @ 1.8GHz	
Memory and Flash	Management Module: 16GB DDR4 ECC memory; 32GB eMMC Flash memory Line Card: 4GB DDR4 memory	
Packet Buffer	R0X38B-R0X43A Line Cards: 8MB packet buffer memory per line card R0X44A-R0X45A Line Cards: 32MB packet buffer memory per line card	
Performance	**System switching capacity**	14 Tbps
	System throughput capacity	5.7 Bpps
	Average latency (LIFO-64-bytes packets)	1G: 5.32 µSec 10G: 1.48 µSec 25G: 2.78 µSec 40G: 1.31 µSec 100G: 1.42 µSec
	Switched virtual interfaces (dual stack)	2,048
	IPv4 host table (ARP)	49,152; Up to 163,840 for R0X44C and R0X45C[2]
	Ipv6 host table (ND)	49,152; Up to 163,840 R0X44C and R0X45C[2]
	Ipv4 unicast routes	61,000; Up to 630,780 R0X44C and R0X45C[2]
	Ipv6 unicast routes	61,000; Up to 598014 R0X44C and R0X45C[2]
	Notes: [2]R0X44C and R0X45C increased scale requires all line cards to be R0X44C/R0X45C – any inclusion of other line cards will reduce scale to original values.	
	Ipv4 multicast routes	8,192
	Ipv6 multicast routes	8,192

Technical Specifications

	MAC table capacity	32,768
	IGMP groups	8,192
	MLD groups	8,192
Performance	**Ipv4/Ipv6/MAC ACL entries (ingress)**	64,000 / 16,384 / 64,000 per line card for R0X44A/R0X44C and R0X45A/R0X45C; 20,480/5,120/20,480 per line card for all other line cards
	Ipv4/Ipv6/MAC ACL entries (egress)	64,000 / 16,384 / 64,000 per line card for R0X44A/R0X44C and R0X45A/R0X45C; 8,192/2,048/8,192 per line card for all other line cards
	VRF	256
Environment	**Operating temperature**	32° to 113°F (0° to 45°C), up to 5,000 feet 32° to 104°F (0° to 40°C), 5,001 to 10,000 feet 1°C de-rating per 1,000 feet above 5,000 feet
	Operating humidity	15% to 95% relative humidity at 113°F (45°C), non-condensing
	Non-operating temperature	-40° to 158°F (-40° to 70°C)
	Non-operating humidity	15% to 95% relative humidity at 149°F(65°C), non-condensing
	Max operating altitude	Up to 10,000ft (3.048 Km)
	Max non-operating altitude	Up to 10,000ft (3.048 Km)
Acoustics	Sound power (LWAd): 6.6 Bel Sound pressure (LpAm, bystander): 46.6 dB when tested with 2 x 1800W PSU (R0X35A), 2 x fan trays, 370W of PoE and traffic on all ports Sound power (LWAd): 6.5 Bel Sound pressure (LpAm, bystander): 46.3 dB when tested with 2 x 3000W PSU (R0X36A), 2 x fan trays, 370W of PoE and traffic on all ports	
Primary airflow	Front-to-back	
Electrical Characteristics	**Frequency**	50-60 Hz
	AC voltage	R0X35A and R0X36A PSUs: 110-127 / 200-240VAC
	Current	R0X35A PSU: 12A @ 110-127VAC, 10A @ 200-240VAC R0X36A PSU: 16A @ 110-240VAC
	Power output	R0X35A PSU: 1800W @ 200-240VAC, 1100W @ 110-127VAC R0X36A PSU: 3000W @ 200-240VAC, 1500W @ 110-127VAC
Safety	EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 +A2:2013; EN62368-1:2014; IEC 60950-1:2005 Ed.2; AM 1:2009+A2:2013; IEC 62368-1 Ed. 2; IEC 60825:2007 (Applies to products with lasers); UL 60950-1, CSA 22.2 No 60950-1; UL 62368-1 Ed. 2	
Emissions	VCCI Class A; EN 55022 Class A; CISPR 22 Class A; IEC/EN 61000-3-2; IEC/EN 61000-3-3; ICES-003 Class A; AS/NZS CISPR 22 Class A; FCC (CFR 47, Part 15) Class A; GB9254; EN55032:2012 Class A; CISPR32:2012 Class A	
Immunity	**Generic**	Directive 2014/35/EU
	EN	EN 55024:2010 +A1:2001 +A2:2003; ETSI EN 300 386 V1.3.3
	ESD	EN 61000-4-2
	Radiated	EN 61000-4-3
	EFT/Burst	EN 61000-4-4
	Surge	EN 61000-4-5
	Conducted	EN 61000-4-6
	Power Frequency Magnetic Field	IEC 61000-4-8
	Voltage Dips and Interruptions	EN 61000-4-11
	Harmonics	EN 61000-3-2, IEC 61000-3-2
	Flicker	EN 61000-3-3, IEC 61000-3-3

Technical Specifications

HPE Aruba Networking 6405 48SFP+ 8SFP56 Switch (R0X30A)		
Description	1x 6405 Chassis (R0X24A) 1x Management Module (R0X31A) 2x Fan Trays (R0X32A) 2x R0X43A Line Card	
	Power supply units ordered separately.	
	Supports any of the following line cards in the open slots: R0X38B, R0X39B, R0X40B, R0X41A, R0X42A, R0X43A, R0X44A, R0X45A, R0X44C, R0X45C	
	Supports PoE standards IEEE 802.3af, 802.3at, 802.3bt (up to 60W)	
	48x 1G/10G SFP+ ports	
	8x 1GbE/10GbE/25GbE/50GbE[1] SFP ports **Notes:** [1]50GbE capability is for use with 50G DACs for both interconnect and HPE Aruba Networking VSX. 50GbE transceiver capability enabled by future software release.	
Additional Ports and Slots	1x RJ-45 console port 1x USB-C console port 1x OOBM 1x USB Type A host port 1x Bluetooth dongle to be used with CX Mobile App	
Power Supplies	Supports four modular front-serviceable power supplies with removable rear-serviceable power cord inlet adapters.	
	Supported power supplies: R0X35A, R0X36A. PoE available will be dependent on the number of management modules, line cards, fan trays and the number of power supplies used. Power supplies not included; order separately.	
Fan Tray	Two field replaceable system fan trays	
Physical Characteristics	**Dimensions**	17.5 (w) x 17.7 (d) x 12.1 (h) in (44.26 x 44.85 cm x 30.66 cm)
	Weight	75 lbs (34.0 kg)
Mounting and Enclosure	Cable management kit included. 2-post rack mounting kit included. 4-post rack mounting kit available separately	
CPU	Management Module: Quad Core ARM Cortex™ A72 @ 1.8GHz Line Card: Dual Core ARM Cortex™ A72 @ 1.8GHz	
Memory and Flash	Management Module: 16GB DDR4 ECC memory; 32GB eMMC Flash memory Line Card: 4GB DDR4 memory	
Packet Buffer	R0X38B-R0X43A Line Cards: 8MB packet buffer memory per line card R0X44A-R0X45A Line Cards: 32MB packet buffer memory per line card	
Performance	**System switching capacity**	14 Tbps
	System throughput capacity	5.7 Bpps
	Average latency (LIFO-64-bytes packets)	1G: 5.32 µSec 10G: 1.48 µSec 25G: 2.78 µSec 40G: 1.31 µSec 100G: 1.42 µSec
	Switched virtual interfaces (dual stack)	2,048
	IPv4 host table (ARP)	49,152; Up to 163,840 for R0X44C and R0X45C[2]
	IPv6 host table (ND)	49,152; Up to 163,840 R0X44C and R0X45C[2]
	IPv4 unicast routes	61,000; Up to 630,780 R0X44C and R0X45C[2]
	IPv6 unicast routes	61,000; Up to 598014 R0X44C and R0X45C[2]
	Notes: [2]R0X44C and R0X45C increased scale requires all line cards to be R0X44C/R0X45C – any inclusion of other line cards will reduce scale to original values.	
	IPv4 multicast routes	8,192
	IPv6 multicast routes	8,192
	MAC table capacity	32,768

Technical Specifications

	IGMP groups	8,192
Performance	**MLD groups**	8,192
	IPv4/IPv6/MAC ACL entries (ingress)	64,000 / 16,384 / 64,000 per line card for R0X44A/R0X44C and R0X45A/R0X45C; 20,480/5,120/20,480 per line card for all other line cards
	IPv4/IPv6/MAC ACL entries (Egress)	64,000 / 16,384 / 64,000 per line card for R0X44A/R0X44C and R0X45A/R0X45C; 8,192/2,048/8,192 per line card for all other line cards
	VRF	256
Environment	**Operating temperature**	32° to 113°F (0° to 45°C), up to 5,000 feet 32° to 104°F (0° to 40°C), 5,001 to 10,000 feet 1°C de-rating per 1,000 feet above 5,000 feet
	Non-operating temperature	15% to 95% relative humidity at 113°F (45°C), non-condensing
	Non-operating humidity	-40° to 158°F (-40° to 70°C)
	Non-operating humidity	15% to 95% relative humidity at 149°F(65°C), non-condensing
	Max operating altitude	Up to 10,000ft (3.048 Km)
	Max non-operating altitude	Up to 10,000ft (3.048 Km)
Primary airflow	Front-to-back	
Electrical Characteristics	**Frequency**	50-60 Hz
	AC voltage	R0X35A and R0X36A PSUs: 110-127 / 200-240VAC
	Current	R0X35A PSU: 12A @ 110-127VAC, 10A @ 200-240VAC R0X36A PSU: 16A @ 110-240VAC
	Power output	R0X35A PSU: 1800W @ 200-240VAC, 1100W @ 110-127VAC R0X36A PSU: 3000W @ 200-240VAC, 1500W @ 110-127VAC
Safety	EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 +A2:2013; EN62368-1:2014; IEC 60950-1:2005 Ed.2; AM 1:2009+A2:2013; IEC 62368-1 Ed. 2; IEC 60825:2007 (Applies to products with lasers); UL 60950-1, CSA 22.2 No 60950-1; UL 62368-1 Ed. 2	
Emissions	VCCI Class A; EN 55022 Class A; CISPR 22 Class A; IEC/EN 61000-3-2; IEC/EN 61000-3-3; ICES-003 Class A; AS/NZS CISPR 22 Class A; FCC (CFR 47, Part 15) Class A; GB9254; EN55032:2012 Class A; CISPR32:2012 Class A	
Immunity	**Generic**	Directive 2014/35/EU
	EN	EN 55024:2010 +A1:2001 +A2:2003; ETSI EN 300 386 V1.3.3
	ESD	EN 61000-4-2
	Radiated	EN 61000-4-3
	EFT/Burst	EN 61000-4-4
	Surge	EN 61000-4-5
	Conducted	EN 61000-4-6
	Power Frequency Magnetic Field	IEC 61000-4-8
	Voltage Dips and Interruptions	EN 61000-4-11
	Harmonics	EN 61000-3-2, IEC 61000-3-2
	Flicker	EN 61000-3-3, IEC 61000-3-3

Technical Specifications

HPE Aruba Networking 6410 96-port 1GbE Class PoE 4 and 4-port SFP56 Switch (JL741A)		
Description	1x 6410 Chassis (R0X25A) 1x Management Module (R0X31A) 4x Fan Trays (R0X32A) 1x R0X38B Line Card 1x R0X39B Line Card	
	Supports any of the following line cards in the open slots: R0X38B, R0X39B, R0X40B, R0X41A, R0X42A, R0X43A, R0X44A, R0X45A, R0X44C, R0X45C	
	96x 10/100/1000BASE-T PoE+ Ports supporting up to 30W per port	
	4x 1/10/25/50G[1] SFP ports **Notes:** [1]50GbE capability is for use with 50G DACs for both interconnect and HPE Aruba Networking VSX. 50GbE transceiver capability enabled by future software release.	
	Supports PoE standards IEEE 802.3af, 802.3at, 802.3bt (up to 60W)	
Additional Ports and Slots	1x RJ-45 console port 1x USB-C console port 1x OOBM 1x USB Type A host port 1x Bluetooth dongle to be used with CX Mobile App	
Power Supplies	Supports four modular front-serviceable power supplies with removable rear-serviceable power cord inlet adapters.	
	Supported power supplies: R0X35A, R0X36A. PoE available will be dependent on the number of management modules, line cards, fan trays and the number of power supplies used. Power supplies not included; order separately.	
Fan tray	Four field replaceable system fan trays	
Physical Characteristics	**Dimensions**	17.5 (w) x 17.7 (d) x 20.8 (h) in (44.26 x 44.85 x 52.88 cm)
	Weight	128.8 lbs (58.3 kg)
Mounting and Enclosure	Cable management kit included. 2-post rack mounting kit included. 4-post rack mounting kit available separately	
CPU	Management Module: Quad Core ARM Cortex™ A72 @ 1.8GHz Line Card: Dual Core ARM Cortex™ A72 @ 1.8GHz	
Memory and Flash	Management Module: 16GB DDR4 ECC memory; 32GB eMMC Flash memory Line Card: 4GB DDR4 memory	
Packet Buffer	R0X38B-R0X43A Line Cards: 8MB packet buffer memory per line card R0X44A-R0X45A Line Cards: 32MB packet buffer memory per line card	
Performance	**System switching capacity**	28 Tbps
	System throughput capacity	11.4 Bpps
	Average latency (LIFO-64-bytes packets)	1G: 5.32 µSec 10G: 1.48 µSec 25G: 2.78 µSec 40G: 1.31 µSec 100G: 1.42 µSec
	Switched virtual interfaces (dual stack)	2,048
	IPv4 host table (ARP)	49,152; Up to 163,840 for R0X44C and R0X45C[2]
	IPv6 host table (ND)	49,152; Up to 163,840 R0X44C and R0X45C[2]
	IPv4 unicast routes	61,000; Up to 630,780 R0X44C and R0X45C[2]
	IPv6 unicast routes	61,000; Up to 598014 R0X44C and R0X45C[2]
	Notes: [2]R0X44C and R0X45C increased scale requires all line cards to be R0X44C/R0X45C – any inclusion of other line cards will reduce scale to original values.	
	IPv4 multicast routes	8,192
	IPv6 multicast routes	8,192
	MAC table capacity	32,768

Technical Specifications

	IGMP groups	8,192
	MLD groups	8,192
Performance	**IPv4/IPv6/MAC ACL entries (ingress)**	64,000 / 16,384 / 64,000 per line card for R0X44A/R0X44C and R0X45A/R0X45C; 20,480/5,120/20,480 per line card for all other line cards
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	VRF	256
Environment	**Operating temperature**	32° to 113°F (0° to 45°C), up to 5,000 feet 32° to 104°F (0° to 40°C), 5,001 to 10,000 feet 1°C de-rating per 1,000 feet above 5,000 feet
	Operating temperature	15% to 95% relative humidity at 113°F (45°C), non-condensing
	Non-operating humidity	-40° to 158°F (-40° to 70°C)
	Non-operating humidity	15% to 95% relative humidity at 149°F(65°C), non-condensing
	Max operating altitude	Up to 10,000ft (3.048 Km)
	Max non-operating altitude	Up to 10,000ft (3.048 Km)
Acoustics	Sound power (LWAd): 6.8 Bel Sound pressure (LpAm, bystander): 48.8 dB when tested with 2 x 1800W PSU (R0X35A), 4 x fan trays, 370W of PoE and traffic on all ports Sound power (LWAd): 6.8 Bel Sound pressure (LpAm, bystander): 48.9 dB when tested with 2 x 3000W PSU (R0X36A), 4 x fan trays, 370W of PoE and traffic on all ports	
Primary airflow	Front-to-back	
Electrical Characteristics	**Frequency**	50-60 Hz
	AC voltage	R0X35A and R0X36A PSUs: 110-127 / 200-240VAC
	Current	R0X35A PSU: 12A @ 110-127VAC, 10A @ 200-240VAC R0X36A PSU: 16A @ 110-240VAC
	Power output	R0X35A PSU: 1800W @ 200-240VAC, 1100W @ 110-127VAC R0X36A PSU: 3000W @ 200-240VAC, 1500W @ 110-127VAC
Safety	EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 +A2:2013; EN62368-1:2014; IEC 60950-1:2005 Ed.2; AM 1:2009+A2:2013; IEC 62368-1 Ed. 2; IEC 60825:2007 (Applies to products with lasers); UL 60950-1, CSA 22.2 No 60950-1; UL 62368-1 Ed. 2	
Emissions	VCCI Class A; EN 55022 Class A; CISPR 22 Class A; IEC/EN 61000-3-2; IEC/EN 61000-3-3; ICES-003 Class A; AS/NZS CISPR 22 Class A; FCC (CFR 47, Part 15) Class A; GB9254; EN55032:2012 Class A; CISPR32:2012 Class A	
Immunity	**Generic**	Directive 2014/35/EU
	EN	EN 55024:2010 +A1:2001 +A2:2003; ETSI EN 300 386 V1.3.3
	ESD	EN 61000-4-2
	Radiated	EN 61000-4-3
	EFT/Burst	EN 61000-4-4
	Surge	EN 61000-4-5
	Conducted	EN 61000-4-6
	Power Frequency Magnetic Field	IEC 61000-4-8
	Voltage Dips and Interruptions	EN 61000-4-11
	Harmonics	EN 61000-3-2, IEC 61000-3-2
	Flicker	EN 61000-3-3, IEC 61000-3-3

Technical Specifications

Standards and Protocols

(Applies To All Products In Series)

- CPU DoS Protection
- Protocol Independent Multicast Dense Mode (PIM-DM)
- Bootstrap Router (BSR) Mechanism for PIM, PIM WG
- Draft-ietf-savi-mix
- IEEE 802.1AB-2005
- IEEE 802.1ak-2007
- IEEE 802.1AX-2008 Link Aggregation
- IEEE 802.1D MAC Bridges
- IEEE 802.1p Priority
- IEEE 802.1Q VLANs
- IEEE 802.1s Multiple Spanning Trees
- IEEE 802.1t-2001
- IEEE 802.1v VLAN classification by Protocol and Port
- IEEE 802.1w Rapid Reconfiguration of Spanning Tree
- IEEE 802.3ab 1000BASE-T
- IEEE 802.3ad Link Aggregation Control Protocol (LACP)
- IEEE 802.3ae 10-Gigabit Ethernet
- IEEE 802.3af Power over Ethernet
- IEEE 802.3at Power over Ethernet
- IEEE 802.3bt Power over Ethernet
- IEEE 802.3z 1000BASE-X
- IEEE 802.3az Energy Efficient Ethernet (EEE)
- RFC 1122 Requirements for Internet Hosts Communications Layers
- RFC 1215 Convention for defining traps for use with the SNMP
- RFC 1256 ICMP Router Discovery Messages
- RFC 1350 TFTP Protocol (revision 2)
- RFC 1393 Traceroute Using an IP Option
- RFC 1403 BGP OSPF Interaction
- RFC 1519 CIDR
- RFC 1542 BOOTP Extensions
- RFC 1583 OSPF Version 2
- RFC 1591 Domain Name System Structure and Delegation
- RFC 1812 Requirements for IP Version 4 Router
- RFC 1997 BGP Communities Attribute
- RFC 1998 An Application of the BGP Community Attribute in Multi-home Routing
- RFC 2131 DHCP
- RFC 2132 DHCP Options and BOOTP Vendor Extensions
- RFC 2236 IGMP
- RFC 2328 OSPF Version 2
- RFC 2385 Protection of BGP Sessions via the TCP MD5 Signature Option
- RFC 2401 Security Architecture for the Internet Protocol
- RFC 2439 BGP Route Flap Damping
- RFC 2460 Internet Protocol, Version 6 (IPv6) Specification
- RFC 2464 Transmission of IPv6 over Ethernet Networks
- RFC 2545 Use of BGP-4 Multiprotocol Extensions for IPv6 Inter-Domain Routing
- RFC 2576 (Coexistence between SNMP V1, V2, V3)
- RFC 2710 Multicast Listener Discovery (MLD) for IPv6

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- RFC 2711 IPv6 Router Alert Option
- RFC 2787 Definitions of Managed Objects for the Virtual Router Redundancy Protocol
- RFC 2918 Route Refresh Capability for BGP-4
- RFC 2925 Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations (Ping only)
- RFC 2934 Protocol Independent Multicast MIB for IPv4
- RFC 3046 DHCP Relay Agent Information Option
- RFC 3056 Connection of IPv6 Domains via IPv4 Clouds
- RFC 3065 Autonomous System Confederation for BGP
- RFC 3068 An Anycast prefix for 6to4 Relay Route
- RFC 3137 OSPF Stub Router Advertisement
- RFC 3376 IGMPv3
- RFC 3416 (SNMP Protocol Operations v2)
- RFC 3418 Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)
- RFC 3623 Graceful OSPF Restart
- RFC 3768 VRRP
- RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6
- RFC 3973 PIM Dense Mode
- RFC 4022 MIB for TCP
- RFC 4113 MIB for UDP
- RFC 4213 Basic Transition Mechanisms for IPv6 Hosts and Routers
- RFC 4251 The Secure Shell (SSH) Protocol
- RFC 4252 SSHv6 Authentication
- RFC 4253 SSHv6 Transport Layer
- RFC 4254 SSHv6 Connection
- RFC 4271 A Border Gateway Protocol 4 (BGP-4)
- RFC 4292 IP Forwarding Table MIB
- RFC 4293 Management Information Base for the Internet Protocol (IP)
- RFC 4360 BGP Extended Communities Attribute
- RFC 4419 Key Exchange for SSH
- RFC 4443 ICMPv6
- RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP)
- RFC 4486 Subcodes for BGP Cease Notification Message
- RFC 4541 IGMP & MLD Snooping Switch
- RFC 4552 Authentication/Confidentiality for OSPFv3
- RFC 4601 PIM Sparse Mode
- RFC 4607 Source-Specific Multicast for IP
- RFC 4675 RADIUS VLAN & Priority
- RFC 4724 Graceful Restart Mechanism for BGP
- RFC 4760 Multiprotocol Extensions for BGP-4
- RFC 4861 IPv6 Neighbor Discovery
- RFC 4862 IPv6 Stateless Address Auto-configuration
- RFC 4940 IANA Considerations for OSPF
- RFC 5065 Autonomous System Confederation for BGP
- RFC 5095 Deprecation of Type 0 Routing Headers in IPv6
- RFC 5187 OSPFv3 Graceful Restart
- RFC 5340 OSPFv3 for IPv6
- RFC 5424 Syslog Protocol
- RFC 5701 IPv6 Address Specific BGP Extended Community Attribute
- RFC 5798 VRRP (exclude Accept Mode and sub-sec timer)
- RFC 5905 Network Time Protocol Version 4: Protocol and Algorithms Specification

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- RFC 6620 FCFS SAVI
- RFC 6987 OSPF Stub Router Advertisement
- RFC 7047 The Open vSwitch Database Management Protocol
- RFC 768 UDP
- RFC 768 User Datagram Protocol
- RFC 783 TFTP Protocol (revision 2)
- RFC 791 IP
- RFC 792 ICMP
- RFC 793 TCP
- RFC 813 Window and Acknowledgement Strategy in TCP
- RFC 815 IP datagram reassembly algorithms
- RFC 826 ARP
- RFC 879 TCP maximum segment size and related topics
- RFC 896 Congestion control in IP/TCP internetworks
- RFC 917 Internet subnets
- RFC 919 Broadcasting Internet Datagrams
- RFC 922 Broadcasting Internet Datagrams in the Presence of Subnets (IP_BROAD)
- RFC 925 Multi-LAN address resolution
- RFC 951 BOOTP
- RFC 1027 Proxy ARP
- SNMPv1/v2c/v3
- RFC 4861 IPv6 Neighbor Discovery
- RFC 4862 IPv6 Stateless Address Auto-configuration
- ITU-T Rec G.8032/Y.1344 M
- 1 50G capability for SFP56 ports available with a future software release
- RFC 2132 DHCP Options and BOOTP Vendor Extensions
- RFC 1757 Remote Network Monitoring Management Information Base
- 2.5G/5GBASE-T (IEEE 802.3bz-2016), 2.5G/5G NBASE-T
- 10GBASE-T (IEEE 802.3an-2006)
- 25-Gigabit Ethernet (IEEE 802.3by-2016, 802.3cc-2017)
- 40-Gigabit Ethernet (IEEE 802.3ba-2010)
- 50-Gigabit Ethernet (IEEE 802.3cd-2018)
- 100-Gigabit Ethernet (IEEE 802.3ba-2010, 802.3bj-2014, 802.3bm-2014)
- RFC 3101 OSPF Not-so-stubby-area option
- RFC 4750 OSPFv2 MIB partial support no SetMIB

Summary of Changes

Date	Version History	Action	Description of Change
05-Feb-2024	Version 24	Changed	Configuration Information section was updated
04-Dec-2023	Version 23	Changed	Obsolete SKU was removed. Configuration Information section was updated. Series name was updated.
10-Jul-2023	Version 22	Changed	Configuration Information section was updated.
15-May-2023	Version 21	Changed	Configuration Information section was updated.
13-Mar-2023	Version 20	Changed	Configuration Information section was updated.
06-Feb-2023	Version 19	Changed	Standard Features and Configuration Information sections were updated.
05-Dec-2022	Version 18	Changed	Configuration Information section was updated and new SKUs were added.
07-Nov-2022	Version 17	Changed	Standard Features and Configuration Information section were updated.
03-Oct-2022	Version 16	Changed	Configuration Information section was updated.
01-Aug-2022	Version 15	Changed	Standard Features and Configuration Information section were updated.
06-Jun-2022	Version 14	Changed	Standard Features and Configuration Information sections were updated.
02-May-2022	Version 13	Changed	Configuration Information section was updated.
06-Dec-2021	Version 12	Changed	Standard Features, and Technical Specifications sections were updated. SKUs were added in Configuration Information section.
09-Aug-2021	Version 11	Changed	Overview, Standard Features, and Technical Specifications sections were updated.
07-Jun-2021	Version 10	Changed	Overview, Standard Features, and Configuration Information sections were updated.
04-May-2021	Version 9	Changed	Standard Features and Technical Specifications sections were updated.
08-Mar-2021	Version 8	Changed	SKUs added in Configuration Information section.
01-Feb-2021	Version 7	Changed	Configuration Information section was updated.
07-Dec-2020	Version 6	Changed	Standard Features and Technical Specifications sections were updated.
10-Aug-2020	Version 5	Changed	Standard Features, Configuration Information and Technical Specifications sections were updated.
06-Jul-2020	Version 4	Changed	SKU description was updated in Technical Specification section.
23-Mar-2020	Version 3	Changed	Standard Features, Configuration Information and Technical Specifications sections were updated. Obsolete SKUs were removed.
03-Feb-2020	Version 2	Changed	Standard Features, Configuration Information and Technical Specifications sections were updated.
01-Nov-2019	Version 1	New	New QuickSpecs

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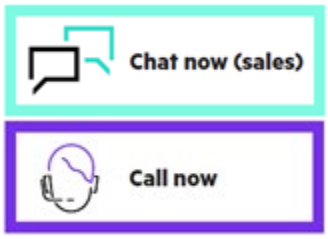

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