DATA SHEET

ARUBA 8320 SWITCH SERIES

PRODUCT OVERVIEW

The past several decades in networking have been defined by static, closed networking solutions designed for the client-server era. Aruba is introducing the Aruba 8320 campus core and aggregation switch series, a game-changing solution offering a flexible and innovative approach to dealing with the demands of the mobile, cloud and IoT era.

The 8320 switch series provides industry-leading line rate 1/10GbE (SFP/SFP+ and 10GBASE-T) and 40GbE connectivity in a compact 1U form factor. Together with the modular Aruba 8400 chassis, the 8320 rounds out Aruba's Mobile First switching portfolio with an enterprise core and aggregation solution that ensures higher performance and higher uptime.

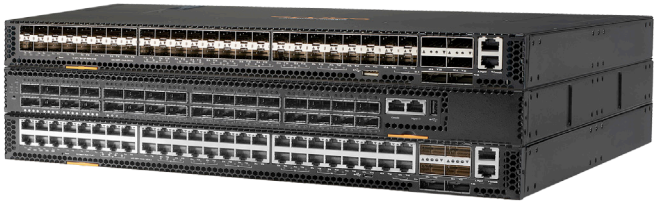
The 8320 switch series is based on the new ArubaOS-CX, a modern software system for the enterprise core that automates and simplifies many critical and complex network tasks, delivers enhanced fault tolerance and facilitates zero-service disruption during planned or unplanned control-plane events. The key innovations in ArubaOS-CX are its micro-services style modular architecture, REST APIs, Python scripting capabilities, Aruba Network Analytics Engine and Aruba Virtual Switching Extension (VSX).

ArubaOS-CX is based on a modular architecture that allows individual process re-startability and upgrades. Its REST APIs and Python scripting enables fine-grained programmability of the switch functions and its unique Aruba Network Analytics Engine provides the ability to monitor and troubleshoot the network easily.

Aruba's new virtualization technology, Aruba VSX, takes advantage of the ArubaOS-CX modern architecture, and delivers best in class high availability required by campus core and aggregation solutions.

The Network Analytics Engine framework is made up of a time series database and associated REST APIs.

The time series database may be used to store configuration and operational state. Customers can use ArubaOS-CX REST APIs, Python scripting capabilities and time series data to write software modules for trouble shooting problems. The time series data may also be used to analyze trends, identify anomalies and predict future capacity requirements.



KEY FEATURES

- High performance 2.5Tbps with 1,905MPPS
- High availability with Aruba Virtual Switching Extension (VSX), and redundant, hot-swappable power supplies and fans
- ArubaOS-CX enables automation and programmability using built-in REST APIs and Python scripts
- Intelligent monitoring and visibility with Aruba Network Analytics Engine
- Advanced Layer 2/3 feature set includes BGP, OSPF, VRF, and IPv6
- Compact 1U switches with 1/10GbE (SFP/SFP+ and 10GBASE-T) and 40GbE connectivity

FEATURES AND BENEFITS

Product architecture

- ArubaOS-CX
  - Modular, Linux based and built with OVSDB to support a database-centric operating system.
  - Distributed architecture with separation of data and control planes.
  - Includes independent monitoring and restart of individual software modules, and enhanced software process serviceability functions.
  - Allows individual software modules to be upgraded for higher availability.
- Aruba Network Analytics Engine
  A first of a kind built-in framework for monitoring, troubleshooting and capacity planning. NAE provides automatic base-lining to automatically generate thresholds for alerts which eliminates manual configuration of thresholds.

Performance

- **High-speed fully distributed architecture**
  Provides 2.5Tbps for switching and 1,905MPPS for forwarding. All switching and routing are wire-speed to meet the demands of bandwidth-intensive applications today and in the future.
- **Scalable system design**
  Provides investment protection to support future technologies and higher-speed connectivity

Connectivity

- **High-density port connectivity**
  Choice of compact 1U switches include model with 32 ports of 40GbE and models with 48 ports of 1/10GbE (SFP/SFP+ and 10GBASE-T) and 6 ports of 40GbE. 40GbE ports support QSFP+ transceivers.
- **Jumbo frames**
  Allows high-performance backups and disaster-recovery systems; provides a maximum frame size of 9K bytes
- **Flexible port selection**
  Provides connectivity for 1/10GbE (SFP/SFP+, 10GBASE-T) and 40GbE (QSFP+)
- **Packet storm protection**
  Protects against unknown broadcast, unknown multicast, or unicast storms with user-defined thresholds

Quality of Service (QoS)

- **Powerful QoS feature**
  Supports the following congestion actions: strict priority (SP) queuing and Deficit Weighted Round Robin (DWRR)

Resiliency and high availability

- **High availability for campus core**
  Aruba Virtual Switching Extension* (VSX) is a high availability technology solution designed using the best features of existing HA technologies. Aruba VSX enables a distributed and redundant architecture that is highly available during upgrades inherently by architecture design. High availability is delivered through redundancy gained by deploying two chassis in the core with each chassis maintaining its independent control yet staying synchronizing information via the ArubaOS-CX unique database architecture.

  *Requires ArubaOS-CX 10.1 release.

- **Redundant and load-sharing fans, and power supplies**
  Increases total performance and power availability while providing hitless, stateful failover
- **Hot swappable power supply and fan modules**
  Allows replacement of modules without any impact on other modules
- **Separate data and control paths**
  Separates control from services and keeps service processing isolated; increases security and performance
- **Bidirectional Forward Detection (BFD)**
  Enable sub-second failure detection for rapid routing protocol re-balancing
- **VRRP**
  Allows groups of two routers to dynamically back each other up to create highly available routed environments
- **Unidirectional Link Detection (UDLD)**
  Monitors link connectivity and shuts down ports at both ends if unidirectional traffic is detected, preventing loops in STP-based networks
- **IEEE 802.3ad LACP**
  Supports up to 54 LAGs, each with eight links per LAG; and provides support for static or dynamic groups and a user-selectable hashing algorithm
- **Redundant power supplies**
  Provides N+1 high reliability with hot swappable, redundant power supplies

Virtual private network (VPN)

- **Generic Routing Encapsulation (GRE)**
  Enables tunneling traffic from site to site over a Layer 3 path

Management

- **IPSLA**
  Monitor the network for degradation of various services, including monitoring voice. Monitoring is enabled via the NAE for history and for automated gathering of additional information when anomalies are detected
- **Management interface control**
  Enables or disables each of the following interfaces depending on security preferences: console port, or reset button
- **Industry-standard CLI with a hierarchical structure**
  Reduces training time and expenses, and increases productivity in multivendor installations

- **Management security**
  Restricts access to critical configuration commands; offers multiple privilege levels with password protection; 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)**
  Provides scalable ASIC-based wire speed network monitoring and accounting with no impact on network performance; this allows network operators to gather a variety of sophisticated network statistics and information for capacity planning and real-time network monitoring purposes
- **Remote monitoring (RMON)**
  Uses standard SNMP to monitor essential network functions and supports events, alarms, history, and statistics groups as well as a private alarm extension group
- **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
- **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. Can serve as the NTP server in a customer network
- **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

Layer 2 switching

- **VLAN**
  Supports up to 4,040 port-based or IEEE 802.1Q-based VLANs
- **Bridge Protocol Data Unit (BPDU) tunneling**
  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, with an unlimited number of ports per group
- **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
- **Rapid Per-VLAN spanning tree plus (RPVST+)**
  Allows each VLAN to build a separate spanning tree to improve link bandwidth usage in network environments with multiple VLANs

Layer 3 services

- **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
- **IP Directed Broadcast**
  Support directed broadcast on configured network subnets
- **Dynamic Host Configuration Protocol (DHCP)**
  Simplifies the management of large IP networks and supports client; DHCP Relay enables DHCP operation across subnets
- **Domain Name System (DNS)**
  Provides a distributed database that translates domain names and IP addresses, which simplifies network design; supports client and server

Layer 3 routing

- **Policy Based Routing (PBR)**
  Enables using a classifier to select traffic that can be forwarded based on policy set by the network administrator
- **Static IPv4 routing**
  Provides simple manually configured IPv4 routing
- **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

- **Multiprotocol BGP (MP-BGP) with IPv6 Address Family**
  Enables sharing of IPv6 routes using BGP and connections to BGP peers using IPv6
- **IPv6 Multicast Routing**
  Provides capability to enable routing of IPv6 multicast traffic. Supports multicast listener discovery (MLD), MLD Snooping, and PIM-SM IPv6 Routing
- **6in4 tunnels**
  Supports the tunneling of IPv6 traffic in an IPv4 network
- **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
- **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
- **Static IPv6 routing**
  Provides simple manually configured IPv6 routing
- **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
- **OSPFv3 for IPv6**
  Delivers faster convergence; uses link-state routing Interior Gateway Protocol (IGP), which supports ECMP, NSSA, and IPSEC authentication for increased security and graceful restart for faster failure recovery
- **Equal-Cost Multipath (ECMP)**
  Enables multiple equal-cost links in a routing environment to increase link redundancy and scale bandwidth

Security

- **TAA Compliance**
  The Aruba 8320, a TAA compliant product, with the ArubaOS-CX uses FIPS 140-2 validated cryptography for protection of sensitive information
- **Access control list (ACL) Features**
  Supports powerful ACLs for both IPv4 and IPv6. Supports creation of object groups representing sets of devices like IP addresses. For instance, IT management devices could be grouped in this way. ACLs can also support protecting control plane services such as SSH, SNMP, NTP or web servers
- **Remote Authentication Dial-In User Service (RADIUS)**
  Eases security access administration by using a password authentication server
- **Terminal Access Controller Access-Control System (TACACS+)**
  Delivers an authentication tool using TCP with encryption of the full authentication request, providing additional security
- **Management access security**
  Aruba OS CX provides for both on-box as well as off-box authentication for administrative access. RADIUS or TACACS+ can be used to provide encrypted user authentication. Additionally, TACACS+ can also provide user authorization services
- **Secure shell (SSHv2)**
  Uses external servers to securely log in to a remote device; with authentication and encryption, it protects against IP spoofing and plain-text password interception; increases the security of Secure FTP (SFTP) transfers

Multicast

- **IGMP Snooping**
  Allows multiple VLANs to receive the same IPv4 multicast traffic, lessening network bandwidth demand by reducing multiple streams to each VLAN
- **Protocol Independent Multicast (PIM)**
  Defines modes of IPv4 multicasting to allow one-to-many and many-to-many transmission of information; supports PIM, Sparse Mode (SM)
- **Internet Group Management Protocol (IGMP)**
  Utilizes Any-Source Multicast (ASM) to manage IPv4 multicast networks; supports IGMPv1, v2, and v3

Additional information

- **Green initiative support**
  Provides support for RoHS and WEEE regulations

Warranty and support

- **5-year Warranty**
  See hpe.com/networking/warrantysummary for warranty and support information included with your product purchase.
- **Software releases**
  To find software for your product refer to hpe.com/networking/support; for details on the software releases available with your product purchase, refer to hpe.com/networking/warrantysummary.

SPECIFICATIONS

	Aruba 8320 48p 10G SFP/SFP+ and 6p 40G QSFP+ with X472 5 Fans 2 Power Supply Switch Bundle (JL479A)	Aruba 8320 32p 40G QSFP+ with X472 5 Fans 2 Power Supply Switch Bundle (JL579A)	Aruba 8320 48p 1G/10GBASE-T and 6p 40G QSFP+ with X472 5 Fans 2 Power Supply Switch Bundle (JL581A)
I/O ports and slots			
	Supports 48 ports of 1/10G for use with SFP and SFP+ transceivers, and 6 ports of 40G for use with QSFP+ transceivers.	Supports 32 ports of 40G for use with QSFP+ transceivers.	Supports 48 ports of 10GBASE-T and 6 ports of 40G for use with QSFP+ transceivers.
Additional ports and slots			
Module VoQ	16MB Packet Buffer		
Power supplies	Field-replaceable, hot-swappable, and up to 2 power supplies. Bundles (JL479A, JL579A, JL581A) include 2 power supplies.		
Fans	Field-replaceable, hot-swappable, and up to 5 fans. Bundles (JL479A, JL579A, JL581A) include 5 fans.		
MTBF	314,721 hrs	296,526 hrs	275,339 hrs
Physical characteristics			
Dimensions	17.4 (w) x 19.9 (d) x 1.7 (h) in (442 x 505.5 x 43.2 mm)	17.26 (w) x 20.28 (d) x 1.71 (h) in (438 x 515 x 43.5 mm)	18.6 (w) x 17.4 (d) x 1.71 (h) in (473 x 443 x 43.9 mm)
Full configuration weight	20.7 lb (9.4 kg)	21.27 lb (9.7 kg)	20.94 lb (9.5 kg)
Memory and processor			
CPU	2GHz		
Memory, Drive	16GB RAM, 64GB SSD, and 8GB Flash		
Performance			
Switching capacity	2.5Tbs		
MAC address table size	96K		
Environment			
Operating temperature	0°C to 40°C (32°F to 104°F) up to 10,000 ft (3km)		
Operating relative humidity	5% to 95% at 40°C (104°F) non-condensing		
Non-Operating	-40°C to 70°C (-40°F to 158°F) up to 15,000ft (4.6km)		
Non-Operating/Storage relative humidity	5% to 95% @ 65°C (149°F)		
Max operating altitude	Up to 10,000ft (3.048 km)		
Max non-operating	Up to 15,000ft (4.6km)		
Acoustic	Sound Pressure (LpAm) (Bystander) 61.1 dB	Sound Pressure (LpAm) (Bystander) 79dB	Sound Pressure (LpAm) (Bystander) 61.1 dB
Airflow direction	Front-to-Back		

SPECIFICATIONS

	Aruba 8320 48p 10G SFP/SFP+ and 6p 40G QSFP+ with X472 5 Fans 2 Power Supply Switch Bundle (JL479A)	Aruba 8320 32p 40G QSFP+ with X472 5 Fans 2 Power Supply Switch Bundle (JL579A)	Aruba 8320 48p 1G/10GBASE-T and 6p 40G QSFP+ with X472 5 Fans 2 Power Supply Switch Bundle (JL581A)
Electrical characteristics			
Frequency	50-65Hz		
AC Voltage	100-127 and 200-240 with either 50 or 60Hz VAC		
Current	6A (low voltage) – 3A (high voltage		
Power consumption	357 W	310 W	348 W
Safety			
	EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011+A2:2013 EN60825-1 IEC60950-1:2005 Ed.2; Am 1:2009+A2:2013 IEC 60825-1 UL60950-1, CSA 22.2 No 60950-		
EMC			
	EN 55032:2012, Class A EN 55024:2010 EN 61000-3-2:2014, Class A EN 61000-3-3:2013 FCC CFR 47 Part 15:2010, Class A EN 50581:2012 (RoHS)		
Lasers			
	EN60825-1:2014 / IEC 60825-1: 2014 Class 1 Class 1 Laser Products / Laser Klasse 1		
Management			
	SNMP RJ45 for Serial Console USB-Type A for file management only RJ45 Ethernet for OOBM		
Mounting and enclosure			
	Mounts in an EIA standard 19-inch rack or other equipment cabinet (hardware included); horizontal surface mounting only		

SPECIFICATIONS

Standards and Protocols

- 802.1AB-2009
- 802.1ak-2007
- 802.1t-2001
- IEEE 802.1AX-2008 Link Aggregation
- IEEE 802.1p Priority
- IEEE 802.1Q VLANs
- IEEE 802.1s Multiple Spanning Trees
- IEEE 802.1w Rapid Reconfiguration of Spanning Tree
- IEEE 802.3ad Link Aggregation Control Protocol (LACP)
- IEEE 802.3ba 40 and 100 Gigabit Ethernet Architecture
- IEEE 802.3z 1000BASE-X
- RFC 768 UDP
- RFC 791 IP
- RFC 792 ICMP
- RFC 793 TCP
- RFC 826 ARP
- RFC 768 User Datagram Protocol
- RFC 813 Window and Acknowledgement Strategy in TCP
- RFC 815 IP datagram reassembly algorithms
- 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 1215 Convention for defining traps for use with the SNMP
- RFC 1256 ICMP Router Discovery Messages
- RFC 1393 Traceroute Using an IP Option
- RFC 1591 Domain Name System Structure and Delegation
- RFC 1981 Path MTU Discovery for IP version 6
- RFC 1997 BGP Communities Attribute
- RFC 1998 An Application of the BGP Community Attribute in Multi-home Routing
- RFC 2385 Protection of BGP Sessions via the TCP MD5 Signature Option
- RFC 2787 Definitions of Managed Objects for the Virtual Router Redundancy Protocol
- RFC 2918 Route Refresh Capability for BGP-4
- RFC 2934 Protocol Independent Multicast MIB for IPv4
- RFC 3137 OSPF Stub Router Advertisement
- RFC 3176 InMon Corporation's sFlow: A Method for Monitoring Traffic in Switched and Routed Networks
- RFC 3509 Alternative Implementations of OSPF Area Border Routers
- RFC 3623 Graceful OSPF Restart
- RFC 4486 Subcodes for BGP Cease Notification Message
- RFC 4724 Graceful Restart Mechanism for BGP
- RFC 4940 IANA Considerations for OSPF
- RFC 5187 OSPFv3 Graceful Restart
- RFC 6987 OSPF Stub Router Advertisement
- RFC 7047 The Open vSwitch Database Management Protocol
- RFC 4251 The Secure Shell (SSH) Protocol
- RFC 4271 A Border Gateway Protocol 4 (BGP-4)
- RFC 4291 IP Version 6 Addressing Architecture
- RFC 4292 IP Forwarding Table MIB
- RFC 4293 Management Information Base for the Internet Protocol (IP)

BUNDLES AND ACCESSORIES

Aruba 8320 Bundles

- JL479A Aruba 8320 Bundle includes: 48p 10G SFP/SFP+ and 6p 40G QSFP+ Switch, 5 x Fans, 2 x Power Supplies, 1 x 2-post Rack Kit
- JL579A Aruba 8320 Bundle includes: 32p 40G QSFP+, 5 x Fans, 2 x Power Supplies, 1 x 2-post Rack Kit
- JL581A Aruba 8320 Bundle includes: 48p 1G/10GBASE-T and 6p 40G QSFP+, 5 x Fans, 2 x Power Supplies, 1 x 2-post Rack Kit

Accessories

- Aruba X371 400W AC Power Supply (JL480A)
- Aruba X721 Front-to-Back Fan (JL481A)

Power supply

- Aruba X371 400W AC Power Supply (JL480A)

Mounting kit

- Aruba X472 2-post Rack Kit (JL482A)
- Aruba X474 4-post Rack Kit (JL483A)

Console Cable

- Aruba X2C2 RJ45 to DB9 Console Cable (JL448A)

Transceivers

- Aruba 1G SFP LC SX 500m MMF XCVR (J4858D)
- Aruba 1G SFP LC LX 10km SMF XCVR (J4859D)
- Aruba 1G SFP LC LH 70km SMF XCVR (J4860D)
- Aruba 1G SFP RJ45 T 100m Cat5e XCVR (J8177D)
- Aruba 10G SFP+ LC SR 300m MMF XCVR (J9150D)
- Aruba 10G SFP+ LC LR 10km SMF XCVR (J9151D)
- Aruba 10G SFP+ LC ER 40km SMF XCVR (J9153D)
- Aruba 10GBASE-T SFP+ RJ45 30m Cat6A XCVR (JL563A)[1]
- Aruba 10G SFP+ to SFP+ 1m DAC Cable (J9281D)
- Aruba 10G SFP+ to SFP+ 3m DAC Cable (J9283D)
- Aruba 40G QSFP+ LC BiDi 150m MMF XCVR (JL308A)
- HPE X142 40G QSFP+ MPO SR4 Transceiver (JH231A)
- HPE X142 40G QSFP+ LC LR4 SM Transceiver (JH232A)
- HPE X142 40G QSFP+ MPO eSR4 300M XCVR (JH233A)
- Aruba 40G QSFP+ LC ER4 40km SMF XCVR (Q9G82A)
- HPE X242 40G QSFP+ to QSFP+ 1m DAC Cable (JH234A)
- HPE X242 40G QSFP+ to QSFP+ 3m DAC Cable (JH235A)
- HPE X242 40G QSFP+ to QSFP+ 5m DAC Cable (JH236A)

Note: 8320 Series Switches do not support the use of 10G LRM (J9152D), nor 7M 10G DAC (J9285D)

[1] Maximum of 12 10GBASE-T transceivers in Model JL479A (n/a to other 8320 models)

DS_8320Series_112818 a00036440enw