Overview

Arista 7280E 10/40/100GbE High Performance Switch Series

HPE and Arista share a common vision around the need to deliver secure hybrid IT solutions and experiences built on industry-leading software-defined infrastructure—helping customers to operate their workloads with speed and agility to grow their business. This partnership will provide our customers with proven networking solutions that are superior to legacy alternatives and that complement HPE compute, storage, virtualization, and cloud offerings.

The Arista 7280E series are key components of the Arista 7000 series portfolio of data center switches. The Arista 7280E series are purpose 10/40/100GbE fixed configuration systems built for the highest performance environments, where wire speed L2 and L3 forwarding are combined with advanced features for network virtualization, open monitoring, and network analysis, resiliency, and architectural flexibility. The 7280E capabilities address the requirements for modern networking and rich multimedia content delivery requiring a lossless forwarding solution.

The 7280E series are available in three models, each with 48 SFP+ ports for 1/10GbE and a choice of 40GbE and 100GbE uplinks. The 7280SE-64 has four QSFP+ uplink ports that allow a choice of four 40GbE or up to 16 additional 10GbE ports with the use of transceivers or cables. The 7280SE-72 delivers two 100GbE uplinks through the use of Arista MXP interfaces and embedded optics. Each MXP port enables twelve 10 GbE, three 40GbE, or one 100 GbE for a wide choice of cost-effective connections. The 7280SE-68 has two 100 GbE QSFP uplinks that allow for the use of both 100GbE and 40GbE optics for the widest range of both short- and long-reach connection options, active and passive cables.

All models in the 7280E series deliver rich layer 2 and layer 3 features with wire speed performance up to 1.44 Terabits per second. The Arista 7280E series offers a virtual output queue architecture combined with an ultra-deep 9 GB of packet buffers that eliminates head of line blocking and allows for lossless forwarding under sustained congestion and the most demanding application loads. Combined with Arista EOS the 7280E series delivers advanced features for HPC, big data, content delivery, cloud, and virtualized environments.

Arista 7280E family

Product Highlights

Performance

- 7280SE-64: 48 x 1/10GbE and 4 x 10/40GbE
- 7280SE-68: 48 x 1/10GbE and 2 x 100GbE
- 7280SE-72: 48 x 1/10GbE and 2 x MXP
- Up to 1.44 terabits per second
- Up to 900 million packets per second • Wire speed L2 and L3 forwarding

Data center optimized design

Cloud networking ready

- 128K-256K MAC Addresses
- 128K-256K IPv4 and IPv6 Host Routes
- 64K IPv4 Routes

Resilient control plane

- High Performance x86 CPU
- 4GB DRAM
- 4GB Flash

Overview

- Ultra-deep 9 GB packet buffer
- Typical power under 4W per 10GbE port
- 1 + 1 redundant and hot-swappable power
- N + 1 redundant and hot-swappable fans
- Front-to-rear or rear-to-front cooling
- Designed for NEBS
- Tool-less rails for simple installation

Virtualization and provisioning

- CloudVision
- VXLAN for next generation DC • VM Tracer
- LANZ for microburst detection
- DANZ Advanced Mirroring & TAP Aggregation for improved visibility
- Zero-touch Provisioning (ZTP)
- Advanced Event Monitoring
- sFlow (RFC3176)
- IEEE 1588 PTP
- User applications can run in a VM

Built-in solid state storage

- Store logs and data captures
- Leverage Linux® tools with no limitations

Arista Extensible Operating System

- Single binary image
- Fine grained modular network OS
- Stateful fault containment (SFC)
- Stateful fault repair (SFR)
- Full access to Linux shell and tools
- Extensible platform—bash, python, C++

Arista EOS

The Arista 7280E runs the same Arista EOS software as all Arista products, simplifying network administration. Arista EOS is a modular switch operating system with a unique state-sharing architecture that cleanly separates switch state from protocol processing and application logic. Built on top of a standard Linux kernel, all EOS processes run in their own protected memory space and exchange state through an in-memory database. This multiprocess state-sharing architecture provides the foundation for in-service software updates and self-healing resiliency.

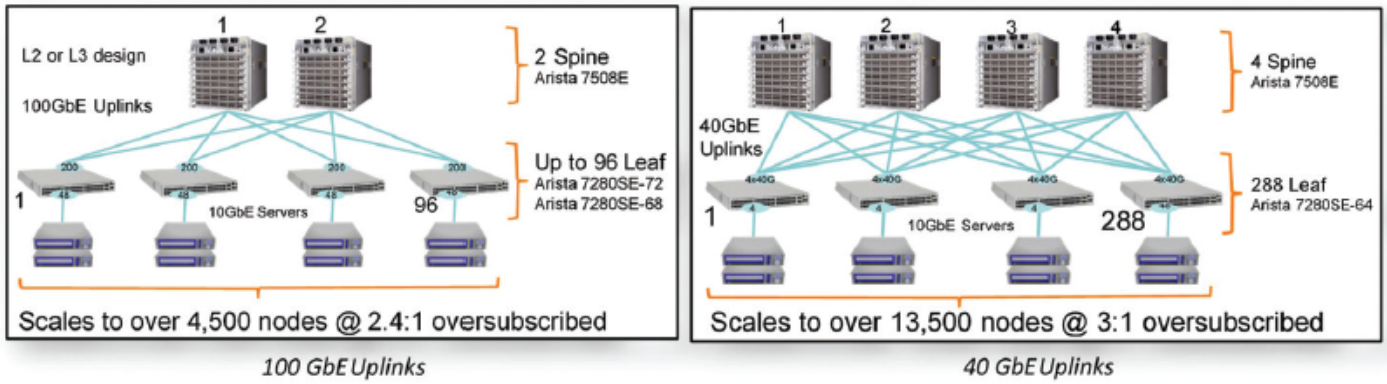
With Arista EOS, advanced monitoring and automation capabilities such as Zero Touch Provisioning, VMTracer, and Linux-based tools can be run natively on the switch with the powerful quad-core x86 CPU subsystem.

Maximum flexibility for scale-out network designs

Scale-out network designs enable solutions to start small and evolve over time. A simple two-way design can evolve without significant changes to the architecture. The Arista 7280E includes enhancements that allow for flexible scale-out designs:

- 128-way ECMP and 128-way MLAG to provide scalable designs and balance traffic evenly across large scale two-tier leaf-spine designs
- VOQ architecture and deep packet buffering to eliminate head of line blocking
- Flexible allocation of L2 and L3 forwarding table resources for more design choice
- Wide choice of dense 10/40/100 Gb ports for single port multispeed flexibility
- VXLAN routing, bridging, and gateway for physical to virtualization communication to enable next generation data center designs
- LANZ, DANZ, PTP, sFlow, and multiport mirroring to detect micro-burst congestion and provide network-wide visibility
- ACL scalability with up to 12K entries per forwarding engine and 36K ACL entries per module

Overview



Arista leaf-spine two-tier network architecture

Software-defined networking

Arista Software-Defined Cloud Networking (SDCN), combines the principles that have made cloud computing the unstoppable force that it is: automation, self-service provisioning, and linear scaling of both performance and economics coupled with the trend in software-defined networking that delivers: network virtualization, custom programmability, simplified architectures, and lower capital expenditure. This combination creates a best-in-class software foundation for maximizing the value of the network to both the enterprise and service provider data center. A new architecture for the most mission-critical location within the IT infrastructure that simplifies management and provisioning, speeds up service delivery, lowers costs, and creates opportunities for competitive differentiation, while putting control and visibility back in the hands of the network and systems administrators.

Enhanced features for high-performance networks

The Arista 7280E delivers a suite of advanced traffic control and monitoring features to improve the agility of modern high-performance environments, with solutions for data monitoring, precise timing, and next-generation virtualization.

Precise data analysis

Arista Latency Analyzer (LANZ) and precision Data Analyzer (DANZ) are integrated features of EOS. DANZ provides a solution to monitoring and visibility challenges at 10/40/100 Gbps, giving IT operations the ability to proactively deliver feedback on congestion events, filter, replicate, aggregate, and capture traffic without affecting production performance. LANZ provides precise real-time monitoring of micro-burst and congestion events before they impact applications, with the ability to identify the sources and capture affected traffic for analysis.

Precision timing (IEEE 1588)

The IEEE 1588 Precision Time Protocol enables building and maintaining an accurate timing solution that delivers highly accurate precision-time synchronization to sub-microsecond accuracy to applications within existing network infrastructure with no need to invest in and deploy a separate timing network. Arista's 7280E series hardware-assisted Precision Time Protocol solution provides a high- performance and robust mechanism for accurate in-band time distribution to servers, routers, and other switches.

Audio Video Bridging (AVB)

Audio Video Bridging (AVB) standards allow professional media to be reliably transported over an Ethernet network with the benefits of a packet-based infrastructure; greatly simplified cabling, great flexibility in signal routing and processing, and the advantage of extremely low costs due to the ubiquitous nature of Ethernet. The 7280E incorporates EOS support for IEEE AVB specifications for precise synchronization, traffic shaping, admission control, and device identification.

Virtualization

Supporting next-generation virtualized data centers requires tight integration with orchestration tools and emerging encapsulation technologies such as VXLAN. The 7280E builds on the valuable tools already provided by the Arista VM Tracer suite to integrate directly into encapsulated environments. Offering a wire-speed gateway between VXLAN and traditional L2/3 environments, the 7280E makes integration of non-VXLAN aware devices including servers, firewalls and load-balancers seamless and provides the ability to leverage VXLAN as a standards-based L2 extension technology for non-MPLS environments.

Overview

Arista Event Management (AEM)
Simplifying the overall operations, AEM provides the tools to customize alerts and actions. AEM is a powerful and flexible set of tools to automate tasks and customize the behavior of EOS and the operation of the overall data center switching infrastructure. AEM allows operators to fully utilize the intelligence within EOS to respond to real-time events, automate routine tasks, and automate actions based on changing network conditions.

Flexible combination of 10/40/100 G
The 7280E delivers unprecedented levels of buffering, scale, and availability with high-density 10GbE interfaces and a choice of uplink interfaces as shown on the right from top to bottom:

Arista 7280E Flexible Port Combinations

- 7280SE-72: 2 MXP ports for 2 x 100 G, 6 x 40 G or 24 x 10 G
- 7280SE-68: 2 QSFP100 ports for 2 x 100 G, 2 x 40 G or 8 x 10 G
- 7280SE-64: 4 QSFP+ ports for 4 x 40 G or 16 x 10 G

Embedded optics combined with MPO interfaces provide a multispeed-port (MXP) capability that increases system density with a choice of 10/40/100 G interfaces. MXP ports support a mix and match option of 12 x 10 G, 3 x 40 G, or 1 x 100 G per port. With support for up to 400 m over multimode fiber MXP ports provide high-density and seamless migration from 10GbE to 100GbE without replacing transceivers or lowering system capacity.
QSFP100 ports enable a wide range of standards based 100G and 40G optics for both single and multimode fiber for distances up to 40km. Each interface can be configured independently for either 40G or 100G, or a 4x10G mode using breakout cables or optics.
QSFP+ ports enable the widest choice of copper, multimode, and single-mode optics with both 10GbE and 40GbE options using both duplex and parallel technology that reach up to 40km.

Deep buffers and deterministic network performance
The Arista 7280E series uses a deep buffer virtual output queue (VOQ) architecture that eliminates head-of-line (HOL) blocking and virtually eliminates packet drops even in the most congested network scenarios. An advanced traffic scheduler fairly allocates bandwidth between all virtual output queues while accurately following queue disciplines including weighted fair queueing, fixed priority, or hybrid schemes including 802.1Qaz ETS. As a result, the Arista 7280E can handle the most demanding data center requirements with ease, including mixed traffic loads of real-time, multicast, and storage traffic while still delivering low latency.

High availability
The Arista 7280E switches were designed for high availability and simple provisioning from a software and hardware perspective. Key high availability features include:
1 + 1 hot-swappable power supplies and four N + 1 hot-swappable fans
Color coded PSU's and fans
Live software patching
Self-healing software with stateful fault repair (SFR)
Smart System Upgrade (SSU)
Up to sixty-four 10GbE or 40GbE ports per link aggregation group (LAG)
Multi-chassis LAG for active/active L2 multi pathing
128-way ECMP routing for load balancing and redundancy

Overview

Arista 7280E Rear View: Rear-to-front airflow model (blue)

Hot swap and reversible power supply and fan modules

Features and Benefits

Layer 2 Features

- 802.1w Rapid Spanning Tree
- 802.1s Multiple Spanning Tree Protocol
- Rapid Per-VLAN Spanning Tree (RPVST+)
- 4096 VLANs
- Q-in-Q
- 802.3ad link aggregation/LACP
  - 64 ports/channel
  - 72 groups per system
- MLAG (Multi-Chassis Link Aggregation)
  - Uses IEEE 802.3ad LACP
  - 128 ports per MLAG
- 802.1Q VLANs/Trunking
- 802.1AB Link Layer Discovery Protocol
- 802.3x Flow Control
- Jumbo Frames (9216 Bytes)
- IGMP v1/v2/v3 snooping
- Storm Control
- 802.1 AVB

Layer 3 Features

- Static routes
- Routing protocols: OSPF, OSPFv3, BGP, MP-BGP, IS-IS, and RIPv2
- 128-way Equal Cost Multipath Routing (ECMP)
- VRF
- BFD
- IGMP v2/v3
- PIM-SM/PIM-SSM
- Anycast RP (RFC 4610)
- MSDP
- VRRP
- Virtual ARP (VARP)
- Policy-based routing (PBR)

Extensibility

- Linux tools
  - Bash shell access and scripting
  - RPM support
  - Custom kernel modules
- Software-defined networking (SDN)
  - eAPI
  - OpenStack® Neutron Support
- Programmatic access to system state
  - Python
  - C++
- Native KVM/QEMU support

Standards Compliance

- 802.1D Bridging and Spanning Tree
- 802.1p QOS/COS
- 802.1Q VLAN Tagging
- 802.1w Rapid Spanning Tree
- 802.1s Multiple Spanning Tree Protocol
- 802.1AB Link Layer Discovery Protocol
- 802.3ad Link Aggregation with LACP
- 802.3x flow control
- 802.3ab 1000BASE-T
- 802.3z Gigabit Ethernet
- 802.3ae 10 Gigabit Ethernet
- 802.3ba 40 Gigabit Ethernet
- 802.3ba 100 Gigabit Ethernet
- RFC 2460 Internet Protocol, Version 6
- (IPv6) Specification
- RFC 2461 Neighbor Discovery for IP Version
- 6 (IPv6)
- RFC 2462 IPv6 Stateless Address Autoconfiguration
- RFC 2463 Internet Control Message
- Protocol (ICMPv6) for the Internet Protocol

Overview

- Route maps

Advanced Monitoring and Provisioning

- Latency analyzer and microburst detection (LANZ)
  - Configurable congestion notification (CLI, Syslog)
- Streaming events (GPB encoded)
  - Capture/mirror of congested traff*
- Zero-touch provisioning (ZTP)
- Advanced mirroring
  - Port mirroring (16 sessions)
  - Enhanced remote port mirroring*
  - SPAN/TAP M:N aggregation
  - L2/3/4 filtering*
- Advanced Event Management suite (AEM)
  - CLI Scheduler
  - Event Manager
  - Event Monitor
  - Linux tools
- Integrated packet capture/analysis with TCPDump
- Restore and configure from USB
- RFC 3176 sFlow
- Integrated SSD for logging and data capture
- IEEE 1588 PTP*

Virtualization Support

- VXLAN gateway (draft-mahlingam-duttdcops-vxlan-01)
- VXLAN tunnel endpoint
- VXLAN bridging
- VM Tracer VMware® Integration
  - VMware vSphere® support
  - VM Auto Discovery
  - VM Adaptive Segmentation
  - VM Host View

Security Features

- Ingress/Egress ACLs using L2, L3, L4 fields
- ACL Logging and Counters
- Control Plane Protection (CPP)
- DHCP Relay
- MAC Security
- TACACS+
- RADIUS
- ARP trapping and rate limiting

Quality of Service (QoS) Features

- Up to 8 queues per port
- Strict priority queueing
- 802.1p based classification
- DSCP based classification and remarking
- Egress shaping/WRR
- Policing/shaping
- Rate limiting*
- Explicit Congestion Notification (ECN)
- Per-Priority Flow Control (PFC)
- Version 6 (IPv6) Specification
- IEEE 1588-2008 Precision Time Protocol

SNMP MIBs

- RFC 3635 EtherLike-MIB
- RFC 3418 SNMPv2-MIB
- RFC 2863 IF-MIB
- RFC 2864 IF-INVERTED-STACK-MIB
- RFC 2096 IP-FORWARD-MIB
- RFC 4363 Q-BRIDGE-MIB
- RFC 4188 BRIDGE-MIBRFC 2013 UDP-MIB
- RFC 2012 TCP-MIB
- RFC 2011 IP-MIB
- RFC 2790 HOST-RESOURCES-MIB
- RFC 3636 MAU-MIB
- RMON-MIB
- RMON2-MIB
- HC-RMON-MIB
- LLDP-MIB
- LLDP-EXT-DOT1-MIB
- LLDP-EXT-DOT3-MIB
- ENTITY-MIB
- ENTITY-SENSOR-MIB
- ENTITY-STATE-MIB
- ARISTA-ACL-MIB
- ARISTA-QUEUE-MIB
- RFC 4273 BGP4-MIB
- RFC 4750 OSPF-MIB
- ARISTA-CONFIG-MAN-MIB
- ARISTA-REDUNDANCY-MIB
- RFC 2787 VRRPv2MIB
- MSDP-MIB
- PIM-MIB
- IGMP-MIB
- IPMROUTE-STD-MIB
- SNMP authentication failure trap
- ENTITY-SENSOR-MIB support for DOM
- (digital optical monitoring)
- User configurable custom OIDs

See EOS release notes for latest supported MIBs

Overview

- 802.1Qaz Enhanced Transmission Selection
- (ETS)*
- Data Center Bridging Extensions (DCBX)

Network Management

- CloudVision
- 100/1000 Management Port
- RS-232 Serial Console Port
- USB Port
- SNMP v1, v2, v3
- Management over IPv6
- Telnet and SSHv2
- Syslog
- AAA
- Industry Standard CLI
- Beacon LED for system identification

* Not currently supported in EOS

Configuration

Ordering Information

Description	Arista SKU	HPE SKU
Arista 7280E 48SFP+ 4QSFP+ Front-to-Back AC Switch	DCS-7280SE-64-F	JH568A
Arista 7280E 48SFP+ 4QSFP+ Back-to-Front AC Switch	DCS-7280SE-64-R	JH569A
Arista 7280E 48SFP+ 2QSFP28 Front-to-Back AC Switch	DCS-7280SE-68-F	JH807A
Arista 7280E 48SFP+ 2QSFP28 Back-to-Front AC Switch	DCS-7280SE-68-R	JH808A
Arista 7280E 48SFP+ 2MXP100 Front-to-Back AC Switch	DCS-7280SE-72-F	JH809A
Arista 7280E 48SFP+ 2MXP100 Back-to-Front AC Switch	DCS-7280SE-72-R	JH810A
Optional		
Arista 7000 Front-to-Back Fan Module	FAN-7000-F	JH856A
Arista 7000 Back-to-Front Fan Module	FAN-7000-R	JH857A
Arista 500W Front-to-Back AC Power Supply	PWR-500AC-F	JH882A
Arista 500W Back-to-Front AC Power Supply	PWR-500AC-R	JH883A
Arista 500W Front-to-Back DC Power Supply	PWR-500-DC-F	JH597A
Arista 500W Back-to-Front DC Power Supply	PWR-500-DC-R	JH599A
Arista Enhanced L3 Software 10G Fix-2 License	LIC-FIX-2-E	JH606A
Arista Virtualization Software 10G Fix-2 License	LIC-FIX-2-V	JH609A
Arista Provisioning Software 10G Fix-2 License	LIC-FIX-2-Z	JH608A
Arista 7001 1RU Accessory Kit	KIT-7001	JH866A
Arista 2 Post 1RU Rack Mount Kit	KIT-2POST-1U-NT	JH863A
Arista 4 Post Rack Mount Kit	KIT-4POST-NT	JH864A
Arista 7001 1RU Accessory Kit	KIT-7001	JH866A
Service		
Arista 7280SE-64 NBD SW 1M Support LTU	SVC-7280SE-64-1M-NB	JH487A
Arista 7280SE-64 4H SW 1M Support LTU	SVC-7280SE-64-1M-4H	JH488A
Arista 7280SE-64 2H SW 1M Support LTU	SVC-7280SE-64-1M-2H	JH489A
Arista 7280SE-68 2H SW 1M Support LTU	SVC-7280SE-68-1M-2H	JH739A
Arista 7280SE-68 4H SW 1M Support LTU	SVC-7280SE-68-1M-4H	JH740A
Arista 7280SE-68 NBD SW 1M Support LTU	SVC-7280SE-68-1M-NB	JH741A
Arista 7280SE-72 2H SW 1M Support LTU	SVC-7280SE-72-1M-2H	JH742A
Arista 7280SE-72 4H SW 1M Support LTU	SVC-7280SE-72-1M-4H	JH743A
Arista 7280SE-72 NBD SW 1M Support LTU	SVC-7280SE-72-1M-NB	JH744A

Warranty, service, and support

The Arista 7280SE switches come with a one-year limited hardware warranty that covers parts, repair, or replacement with a 10-business-day turnaround after the unit is received.
All technical, hardware, and software support for Arista products is provided directly by Arista and not HPE. Consult the Arista Customer Support page for contact information: arista.com/en/support/customer-support. Services may be purchased from HPE or Arista to extend your support coverage and software upgrades. Support will be provided by Arista for these services. For details on Arista warranty and support, see: arista.com/assets/data/pdf/Warranty.pdf
Services may be purchased from HPE or Arista to extend your support coverage and software upgrades. Support will be provided by Arista for these services. For details on Arista warranty and support, see: arista.com/assets/data/pdf/Warranty.pdf.

Configuration

Technical Specifications

Technical Specifications

Model Comparison			
	7280SE-64	**7280SE-68**	**7280SE-72**
Ports	48 x SFP+ 4 x QSFP+	48 x SFP+ 2 x QSFP100	48 x SFP+ 2 x MXP
Max 100GbE Ports	-	2	2
Max 40GbE Ports	4	2	6
Max 10GbE Ports	64	56	72
Throughput	1.28 Tbps	1.36Tbps	1.44 Tbps
Packets/Second	900 Mpps	900 Mpps	900 Mpps
Latency	3.8us	3.8us	3.8us
CPU	Quad-Core x86	Quad-Core x86	Quad-Core x86
System Memory	4 Gigabytes	4 Gigabytes	4 Gigabytes
Flash Storage Memory	4 Gigabytes	4 Gigabytes	4 Gigabytes
Packet Buffer Memory	9GB (3GB per group of ports)		
SSD Storage (optional)	120 Gigabytes		
100/1000 Mgmt Ports	1	1	1
RS-232 Serial Ports	1 (RJ-45)	1 (RJ-45)	1 (RJ-45)
USB Ports	1	1	1
Hot-swap Power Supplies	2 (1+1 redundant)		
Hot-swappable Fans	4 (N+1 redundant)		

Technical Specifications

Reversible Airflow Option	Yes	Yes	Yes
Size (WxHxD)	19 x 1.75 x 20.6” (44.5 x 4.4 x 52.3cm)		
Typical/Max Power Draw	263W / 381W	263W / 405W	262W / 399W
Weight	22lbs (10.0kg)	22.2lbs (10.1kg)	22.4lbs (10.2kg)

Environmental Characteristics	
Operating Temperature	0 to 40°C (32 to 104°F)
Storage Temperature	25 to 70°C (-13 to 158°F)
Relative Humidity	5 to 95%
Operating Altitude	0 to 10,000 ft (0-3,000m)

Supported Optics and Cables	
Interface Type	**QSFP+ ports**
10GBASE-CR	0.5-5m QSFP+ to 4 x SFP+
RS-232 serial ports	1 (RJ-45)
40GBASE-CR4	0.5m to 5m QSFP+ to QSFP+
40GBASE-AOC	3m to 100m
40GBASE-UNIV	150m (OM3) /150m (OM4) /500m (SM)
40GBASE-SRBD	100m (OM3) /150m (OM4)
40GBASE-SR4	100m (OM3) /150m (OM4)
40GBASE-XSR4	300m (OM3) /450m (OM4
40GBASE-PLRL4	1km (1km 4x10G LR/LRL)
40GBASE-LRL4	1km
40GBASE-PLR4	10km (10km 4x10G LR/LRL)
40GBASE-LR4	10km
40GBASE-ER4	40km

Technical Specifications

Interface Type	SFP+ ports
10GBASE-CR	SFP+ to SFP+: 0.5-5m
10GBASE-AOC	SFP+ to SFP+: 3m-30m
10GBASE-SRL	100m (OM3) /150m (OM4)
10GBASE-SR	300m (OM3) /400m (OM4)
10GBASE-LRL	1km
10GBASE-LR	10km
10GBASE-ER	40km
10GBASE-ZR	80km
10GBASE-DWDM	80km
100/1000BASE-T, 1GbE SX/LX	yes

Interface Type	QSFP100 ports
100GBASE-LR4	10km
100GBASE-LRL4	2km
100GBASE-SR4	70m (OM3) / 100m (OM4)
100GBASE-AOC	3m to 30m
100GBASE-CR4	1m to 5m
100GBASE-CWDM4	2km

Standards Compliance	
EMC	Emissions: FCC, EN55022, EN61000-3-2, EN61000-3-3 or EN61000-3-11, EN61000-3-12 (as applicable) Immunity: EN55024 Emissions and Immunity: EN300 386
Safety	UL/CSA 60950-1, EN 60950-1, IEC 60950-1 CB Scheme with all country differences

Technical Specifications

Certifications	North America (NRTL) European Union (EU) BSMI (Taiwan) C-Tick (Australia) CCC (PRC) MSIP (Korea) EAC (Customs Union) VCCI (Japan)
European Union Directives	2006/95/EC Low Voltage Directive 2004/108/EC EMC Directive 2011/65/EU RoHS Directive 2012/19/EU WEEE Directive
NEBS	Configuration Evaluated - DC, front to rear airflow

Summary of Changes

Date	Version History	Action	Description of Change
08-May-2017	From Version 1 to 2	Change	Configuration section updated
06-Mar-2017	Version 1	Created	Document creation.

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