Product Highlights

Performance

- 7280SE-64: 48x1/10GbE and 4 x 10/40GbE
- 7280SE-68: 48x1/10GbE & 2 x 100GbE
- 7280SE-72: 48x1/10GbE & 2 x MXP
- Up to 1.44 terabits per second
- Up to 900 million packets per second
- Wire speed L2 and L3 forwarding
- Under 4 microsecond latency (64 bytes)

Data Center Optimized Design

- Ultra-deep 9GB packet buffer
- Typical power under 4W per 10GbE port
- 1+1 redundant & hot-swappable power
- N+1 redundant & 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

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
- 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 truly modular network OS
- Stateful Fault Containment (SFC)
- Stateful Fault Repair (SFR)
- Full access to Linux shell and tools
- Extensible platform - bash, python, C++

Overview

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 multi-media 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 10GbE, three 40GbE or one 100GbE for a wide choice of cost effective connections. The 7280SE-68 has two 100GbE QSFP uplinks that allows 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 offer a virtual output queue architecture combined with an ultra-deep 9GB 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

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 multi-process 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 include 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 2 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 10G/40G/100G ports for single port multi-speed flexibility
- VXLAN routing, bridging and gateway for physical to virtualization communication to enable next generation data center designs
- LANZ, DANZ, PTP, sFlow and multi-port mirroring to detect micro-burst congestion and provide network wide visibility
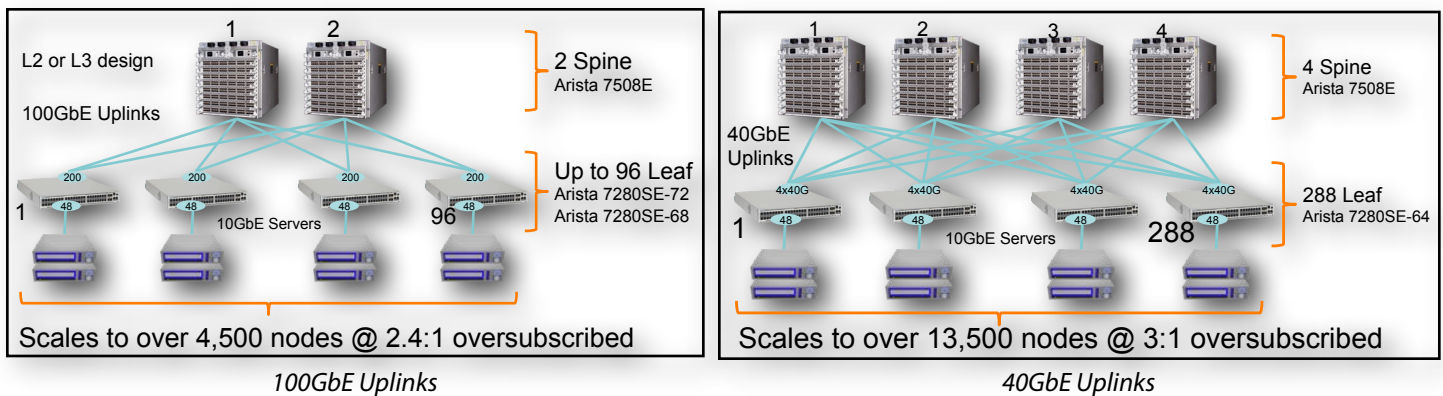
Arista Leaf-Spine Two-Tier Network Architecture

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 10/40/100Gbps 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.

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 10/40/100G

The 7280E deliver unprecedented levels of buffering, scale and availability with high density 10GbE interfaces and and a choice of uplink interfaces as shown on the right from top to bottom:

7280SE-72: 2 MXP ports for 2x 100G, 6x 40G or 24x 10G

7280SE-68: 2 QSFP100 ports for 2x 100G, 2 x 40G or 8x10G

7280SE-64: 4 QSFP+ ports for 4x 40G or 16x10G

Arista 7280E Flexible Port Combinations

Embedded optics combined with MPO interfaces provide a multi-speed port (MXP) capability that increases system density with a choice of 10G/40G/100G interfaces. MXP ports support a mix and match option of 12 x 10G, 3 x 40G or 1x 100G per port. With support for up to 400m over multi-mode 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 multi-mode 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 enables 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 both a software and hardware perspective. Key high availability features include:

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

- 1+1 hot-swappable power supplies and four N+1 hot-swap fans
- Color coded PSU's and fans
- Live software patching
- Self healing software with Stateful Fault Repair (SFR)
- Smart System Upgrade (SSU)
- Up to 64 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

Hot swap and reversible power supply and fan modules

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)
- 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 traffic *
- 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-dutt-dcops-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

- PDP
- Service ACLs
- DHCP Relay / Snooping
- 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)
- 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

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

Scalability

- 128K-256K MAC Addresses
- 96K ARP/ND Entries
- 128K-256K IPv4 Host Routes
- 64K IPv4 Unicast LPM
- 12K IPv6 Unicast LPM Routes
- 128K-256K IPv6 Unicast Host Routes
- 12K-256K Multicast Routes
- Virtual Output Queueing
- Distributed Scheduler
- WFQ, CIR*, ETS*, Fixed Priority

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 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-MIB
- RFC 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

* Not currently supported in EOS

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	QSFP100 ports
100GBASE-SR4	70m OM3 / 100m OM4 Parallel MMF
100GBASE-LR4	10km SM Duplex
100GBASE-LRL4	2km SM Duplex
100GBASE-CWDM4	2km SM Duplex
100GBASE-PSM4	500m SM Parallel
100GBASE-AOC	3m to 30m
100GBASE-CR4	QSFP to QSFP: 1m to 5m

Interface Type	QSFP+ ports
10GBASE-CR	0.5m-5m QSFP+ to 4x SFP+
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

Interface Type	SFP+ ports
10GBASE-CR	SFP+ to SFP+: 0.5m-5m
10G-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
10G-DWDM	80km
100/1000BASE-T 1GbE SX/LX	Yes

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	
Latency		3.8us	
CPU		Quad-Core x86	
System Memory		4 Gigabytes	
Flash Storage Memory		4 Gigabytes	
Packet Buffer Memory		9GB (3GB per group of ports)	
SSD Storage		120 Gigabytes	
100/1000 Mgmt Ports		1	
RS-232 Serial Ports		1 (RJ-45)	
USB Ports		1	
Hot-swap Power Supplies		2 (1+1 redundant)	
Hot-swappable Fans		4 (N+1 redundant)	
Reversible Airflow Option		Yes	
Size (WxHxD)		19 x 1.75 x 20.6" (44.5 x 4.4 x 52.3cm)	
Typical/Max Power Draw [1]	263W / 381W	263W / 405W	262W / 399W
Weight	22lbs (10.0kg)	22.2lbs (10.1kg)	22.4lbs (10.2kg)
EOS Feature Licenses		LIC-FIX-2	

Power Supply Specifications

Power Supply Model	PWR-500AC	PWR-500DC
Input Voltage	100-240AC	40-72V DC
Typical Input Current	6.3 - 2.3A	13.1 - 7.3A 11A at -48V
Input Frequency	50/60Hz	DC
Input Connector	IEC 320-C13	AWG #16-#12
Efficiency (Typical)	93% Platinum	-

[1] Typical power consumption measured at 25C ambient with 50% load on all ports

* Not currently supported in EOS

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
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

Product Number	Product Description
DCS-7280SE-64-F	Arista 7280E, 48xSFP+ & 4x40GbE QSFP+ switch, front-to-rear airflow and dual AC power supplies
DCS-7280SE-64-R	Arista 7280E, 48xSFP+ & 4x40GbE QSFP+ switch, rear-to-front airflow and dual AC power supplies
DCS-7280SE-64#	Arista 7280E, 48xSFP+ & 4x40GbE QSFP+ switch, no fans, no psu (requires fans and psu)
DCS-7280SE-72-F	Arista 7280E, 48xSFP+ & 2x100GbE (multimode MXP) switch, front-to-rear airflow and dual AC power supplies
DCS-7280SE-72-R	Arista 7280E, 48xSFP+ & 2x100GbE (multimode MXP) switch, rear-to-front airflow and dual AC power supplies
DCS-7280SE-72#	Arista 7280E, 48xSFP+ & 2x100GbE (multimode MXP) switch, no fans, no psu (requires fans and psu)
DCS-7280SE-68-F	Arista 7280E, 48xSFP+ & 2x100GbE (QSFP100) switch, front-to-rear airflow and dual AC power supplies
DCS-7280SE-68-R	Arista 7280E, 48xSFP+ & 2x100GbE (QSFP100) switch, rear-to-front airflow and dual AC power supplies
DCS-7280SE-68#	Arista 7280E, 48xSFP+ & 2x100GbE (QSFP100) switch, no fans, no psu (requires fans and psu)

Optional Components

FAN-7000-F	Spare fan module for Arista 7150, 7124SX(FX), 7050, 7280 & 7048-A switches (front-to-rear airflow)
FAN-7000-R	Spare fan module for Arista 7150, 7124SX(FX), 7050, 7280 & 7048-A switches (rear-to-front airflow)
PWR-500AC-F	Spare 500 Watt AC power supply for Arista 7050X and 7280 1RU Switches (front-to-rear airflow)
PWR-500AC-R	Spare 500 Watt AC power supply for Arista 7050X and 7280 1RU Switches (rear-to-front airflow)
PWR-500-DC-F	Spare 500 Watt DC power supply for Arista 7050X and 7280 1RU Switches (front-to-rear airflow)
PWR-500-DC-R	Spare 500 Watt DC power supply for Arista 7050X and 7280 1RU Switches (rear-to-front airflow)
LIC-FIX-2-E	Enhanced L3 License for Arista Fixed switches, 40-132 port 10G (BGP, OSPF, ISIS, PIM, NAT)
LIC-FIX-2-V	Virtualization license for Arista Fixed switches 40-132 port 10G (VMTracer and VXLAN)
LIC-FIX-2-Z	Monitoring & provisioning license for Arista Fixed switches 40-132 port 10G (ZTP, LANZ, TapAgg, OpenFlow)
LIC-FIX-2-FLX-L	FLX-Lite L3 License for Arista Fixed switches, 40-132 port 10G - OSPF, ISIS, BGP, PIM, Up to 256K Routes, EVPN, VXLAN
KIT-7001	Spare accessory kit for Arista 1RU tool-less switches
KIT-2POST-1U-NT	Spare 1RU 2 post rail kit for 1RU tool less systems (7050QX-32S, 7050SX/TX and 7280)
KIT-4POST-NT	Spare 1RU/2RU tool-less rail kits for 4-post installation (7050QX-32S, 7050SX/TX, 7280 and 7250X)

Warranty

The Arista 7280E switches come with a one-year limited hardware warranty, which covers parts, repair, or replacement with a 10 business day turn-around after the unit is received.

Service and Support

Support services including next business day and 4-hour advance hardware replacement are available. For service depot locations, please see: http://www.arista.com/en/service

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