Arista 7280E Series: Q&A

Product Overview

What are the 7280E Series?

The 7280E are a series of purpose built fixed configuration 1RU form factor switches designed with deep buffers, virtual output queues, rich features and support for 10/40/100G ports. They are ideal for high 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 7280SE are a set of three products that provide up to 72 ports of 10G with a choice of uplink ports.

7280SE-64

This model has 48 ports of SFP+, allowing the full range of SFP/SFP+ optics available across all the Arista platforms for 100M/1G/10G connectivity. It also has 4 ports of QSFP+ that can be split out into 4x10G or combined to be a single 40G Ethernet capable port. This provides a total forwarding capacity of 64 x 10G.

7280SE-72

This model has 48 ports of SFP+, allowing the full range of SFP/SFP+ optics available across all the Arista platforms for 100M/1G/10G connectivity. It also has 2 MXP ports, where each MXP port can deliver a choice of 1x100G (SR10), 3x40G (SR4), or 12x10G(SR) using breakout cables. The total forwarding capacity is up to 72x 10G.

7280SE-68

This model has 48 ports of SFP+, allowing the full range of SFP/SFP+ optics available across all the Arista platforms for 100M/1G/10G connectivity. It also has 2 QSFP100 (QSFP28) ports available. These ports each enable a choice 1x100G with QSFP100 optics, 1x40G QSFP+, or 4x10G QSFP+ when broken out using a splitter cable. The 40G QSFP ports are fully backward compatible with the full range of Arista QSFP+ optics. As the total switching capacity is 48x 10G + 2 x 100G the system is named 7280SE-68.

What are the focus features of the 7280E?

One of the key aspects of the 7280E is that it is almost completely on feature parity with the flagship Arista 7500E Series delivering a comprehensive range of L2, L3, Management, Monitoring, Provisioning, Security and flexible forwarding features:

- LANZ - Provide comprehensive data on buffer depth and details
- DANZ - Can tap a range of ports up to and including 100G LR4 ports and supports all the DANZ features

that are available on the 7500E

- IPv4 / IPv6 Scalability - 64K v4 routes and 12K v6 routes
- ECMP - Up to 128 way multi-pathing useful in highly virtualized server environments
- VRF - parity to the 7500E
- VXLAN - parity to the 7500E
- ACL Scalability - 12,000 ACL entries per forwarding engine, and up to 36K per system

In addition the hardware architecture provides some key differentiators:

- Deep Buffers - 9GB buffer per switch or about 125MB per 10G port
- VoQ Design - VoQ allows for lossless buffering in a multi-chip architecture
- First 100G uplinks on a fixed configuration system
- Integrated SSD for local storage
- Reversible airflow, with a choice of AC and DC power supplies
- Designed for NEBS compliance

Many network engineering best practices call for “parallel” test networks that allow simulation of production environments prior to deployment of new features or design changes. The 7280SE delivers a small, highly capable system using the same 7500E Series architecture that can be deployed in a test environment to model or simulate much larger production environments.

What are the focus markets of the 7280E?

The 7280SE is a very high performance ToR switch. This means that modern mission-critical datacenter or high performance 10/40/100G applications are suited to the 7280SE.

The following are a selection of use cases:

- HPC - Storage connectivity where heavy TCP incast can cause dropped packets and performance degradation. The lossless behavior and ultra deep buffers are optimized for HPC and IP Storage.
- Tap Aggregation - Fixed configuration Tap Aggregation device with 10/40/100G capability.
- Enterprise DCs - small Enterprise spines with up to 72x10G and deep buffer architecture without requiring a modular system and leveraging scale out economics in ECMP designs.
- High Capacity Cloud Networks - Specifically targeting environments where 10G hosts connect to 40G or 100G flows. Much like the 7048T where 1 to 10G requires deep buffer, so does 10G to 40G and 100G connectivity.
- 10GbE attached storage - NFS systems requiring dense 10G with the least amount of oversubscription (2.4:1), a choice of 40G and 100G combined with lossless forwarding, high performance and open standards.

- Software Defined Networking - with support for OpenFlow (future), OpenStack Neutron, eAPI and VXLAN the 7280SE Series are ideal for SDN use cases.
- Service Provider networks for aggregating edge equipment utilizing dense 10GbE ports into 100GbE uplinks to consolidate onto optical backbones using far fewer wavelengths.

What software features does the Arista 7280E support?

All Arista products including the 7280E Series runs the same Arista EOS software, binary image simplifying network administration with a single standard across all switches. EOS delivers a rich suite of features for IPv4 and IPv6. For a complete list of supported features please view the supported features matrices at: http://www.arista.com/en/support/supportedfeatures

What EOS licenses are available and what features require them?

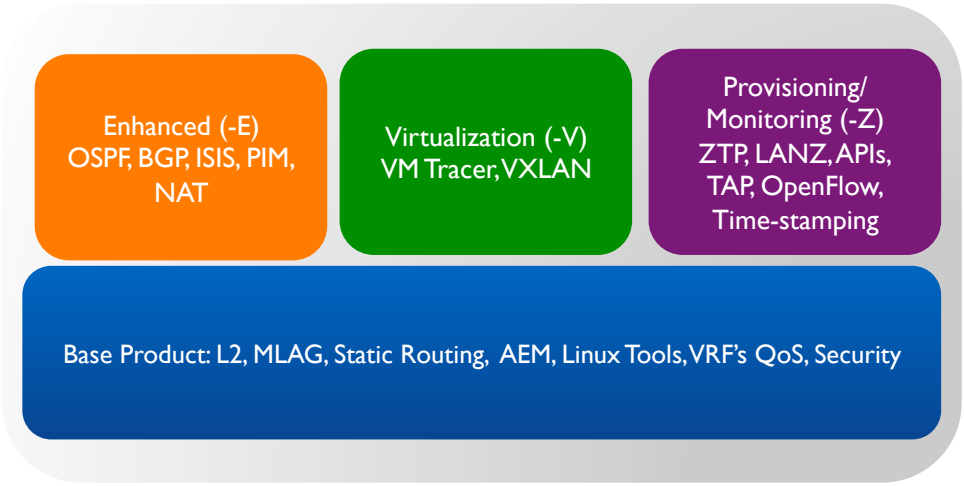
The 7280SE Series uses the same license structure as the fixed products, and supports the same features as the modular 7500E Series. There are three software licenses available for the 7280SE series. Customers using licensed features must purchase the appropriate EOS licenses.

- The Enhanced Routing License (E) enables dynamic unicast (IPv4 and IPv6) and multicast routing protocols – OSPF, BGP, IS-IS and PIM. RIPv2 is supported without the Enhanced License.
- The Virtualization License (V) is required for both the VM Tracer feature and VXLAN features.
- The Network Monitoring and Provisioning License (Z) is required for ZTP, LANZ, eAPI, and the Advanced Mirroring feature sets.

Feature	Product SKU	Platform
Virtualization feature license for Arista Fixed switches 40-128 port 10G (VM Tracer and VXLAN)	LIC-FIX-2-V	7280SE
Network monitoring and provisioning feature license for Arista Fixed switches 40-128 port 10G (ZTP, LANZ, TapAgg, API, Time-stamping)	LIC-FIX-2-Z	7280SE
Enhanced L3 License for Arista Fixed switches, 40-128 port 10G (BGP, OSPF, ISIS, PIM, NAT)	LIC-FIX-2-E	7280SE

For more information on Arista licensing please refer to the official licensing page.

The following image depicts the EOS license structure



What speeds do the 7280E Series ports support?

The table below shows the combinations of speeds supported on each switch

Platform	1/10G Only	10G or 40G	10G, 40G or 100G
7280SE-64	Ports 1 – 48	Port 49 – 52	--
7280SE-68	Ports 1 – 48	--	Ports 49 – 50
7280SE-72	Ports 1 – 48	--	Ports 49 – 50

How scalable is the 7280SE?

The 7280SE uses the same underlying hardware as the 7500E, therefore, many of the scalability numbers are the same. The 7280SE support comprehensive L2 and L3 resources optimized for data center deployments:

Resources	7280SE
MAC Table Size	256K
Max ARP Entries	84K
Max Host Route Prefixes	128K
Max IPv4 Route Prefixes	64K
Max IPv6 Route Prefixes	12K
Max Multicast Groups	64K
Max Egress Forwarding Entries per Forwarding Engine	30K
Max LAG Groups	up to 72 (physical limit)
Max LAG Members	64 member ports
Max MLAG Members	128 ports per MLAG group
Max ECMP Fanout	64-way

Max ACL Entries	12,000 per port group (6 groups)
Buffer per 10GbE Port	125MB
Buffer per 100GbE Port	Up to 1500MB per port
ACL	Up to 12K per forwarding engine

Maximum values dependent on shared resources in some cases

Why is the 9GB of buffering necessary when other fixed configuration systems have 12MB?

Deep buffering is required when lossless performance is necessary. In situations such as the TCP Incast problem, where two or more hosts are trying to communicate with one, deep buffers allow the packets to be buffered instead of dropped.

The other major situation that demands deep buffers is when there is a speed mismatch between end hosts. For example, a 40G storage node trying to communicate with 10G hosts will attempt to send traffic at 40G rates. TCP is notoriously bad in these situations with shallow buffers causing suboptimal conditions. Instead of getting 10Gbps speeds, the dropped packets cause TCP to slow down to 1/10th or less of the lower speed hosts' max, or in this case, 1Gbps when 10Gbps could be possible. Deeper buffers can alleviate the packet drops and smooth out drops, allowing full 10Gbps with TCP applications.

Does the 7280SE include an SSD option?

The 7280SE includes an integrated SSD as the default, and this does not need to be ordered as a specific model. This is different to the 7050 and 7150 Series where an SSD is optional.

What is the power draw on the 7280SE Models?

The maximum power draw is under 400W for all three models, with typical power between 260W and 270W depending on optics or cables used, traffic load and air temperature. The data sheets list typical power at 25C, with 50% traffic, 512B packets, and copper cables.

What efficiency rating do the power supplies have?

AC Power supplies for the 7280SE have an efficiency of over 93% - which equates to a platinum rating.

What are the high availability options?

The Arista 7280E switch was designed for high availability from both 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 PSUs and fans common to Arista 1RU Series
- EOS Zero Touch Provisioning (ZTP)
- Self-healing software with Stateful Fault Repair (SFR)
- Multi-chassis LAG for active/active L2 multi-pathing

- 128-way MLAG and ECMP routing for all-active L2 and L3

Which cables and optics can be used?

All currently supported SFP+ and QSFP+ transceivers are supported on the Arista 7280E Series SFP+ and QSFP+ ports. The SFP+ ports accommodate a full range of 10GbE SFP+ and 1GbE SFP transceivers and cables to provide support for a wide range of connectivity options from short reach copper and multi-mode fiber, to longer reaches over single mode up to 40km and DWDM solutions up to 80km. The SFP options include multi-mode and single-mode fiber transceivers, and both 100Mb and 1Gb over copper cabling. QSFP+ ports support a wide range of 10GbE and 40GbE options for cables, single and multi-mode fiber. The 7280SE-68 will support a wide range of single mode and multi-mode QSFP100 and QSFP+ optics and cables. The full list of supported optics is shown on the data sheets.

How does the MXP port support 12x 10G from a 100G interface?

The MXP port is a 12 port interface using MTP24. This allows standards based 10G on 12 pair, standards based 40G using 3 sets of 4 pairs, or a single 100G using standards based SR10, or 10 lanes. 100G mode disables 2 of the 12 pair and only uses 10 pairs of lanes.

How is the configuration changed from 10G to 40G or 100G?

The MXP and QSFP port configuration for 10G, 40G or 100G is the same as the 7500E platform using the “speed” command as shown below:

```
switch(config-if-Et49/1)#speed forced ?
 10000full  Disable autoneg and force 10 Gbps/full duplex operation
 1000full   Disable autoneg and force 1 Gbps/full duplex operation
 1000half   Disable autoneg and force 1 Gbps/half duplex operation
 100full    Disable autoneg and force 100 Mbps/full duplex operation
 100gfull   Disable autoneg and force 100 Gbps/full duplex operation
 100half    Disable autoneg and force 100 Mbps/half duplex operation
 10full     Disable autoneg and force 10 Mbps/full duplex operation
 10half     Disable autoneg and force 10 Mbps/half duplex operation
 40gfull    Disable autoneg and force 40 Gbps/full duplex operation
```

The first port in a port-group can be 10G, 40G, or 100G. If configured in 100G, all other ports in the port-group become inactive. If configured in 40G mode, ports 1-4 become used for 40G mode, and the others are available for either 10G or 40G modes.

Is changing the speed of the MXP interface disruptive to forwarding on other interfaces?

Changing speeds is non-disruptive to other ports. The forwarding agent does not restart and there is no impact to other ports. Changing speed will disrupt the port you’re adjusting.

What about for 40G QSFP being converted to 4x10G does this require a restart?

The only port affected by changing the speed from 40G to 4x10G (or vice versa) is the port being configured.

What is the minimum EOS software version for the Arista 7280SE Series?

The minimum version of EOS that supports the Arista 7280SE is in the EOS release notes at Release Notes.

What are the options for support?

Arista A-Care Service Options are designed to provide you with world-class support. A-Care service offerings are available 24x7x365 with advance replacement options to minimize any network downtime. All A-Care Service options include full access to bug fixes and software downloads. For more information about A-Care Service options go to http://www.aristanetworks.com/en/service.

Where do I get more information on the Arista 7280E Series?

For more information please go to www.arista.com or contact us at sales@arista.com