

Arista 7300X and 7250X Series: Q&A

Product Overview

What are the 7300X and 7250X Family?

The Arista 7300X Series are purpose built 10/40GbE data center modular switches in a new category called Spline™ (combined Leaf and Spine). These provide high density 1/10/40G in compact and energy efficient form factors, optimized airflow targeted for deployment as middle-of-row/end-of-row in server racks with wire speed layer 2 and layer 3 features, combined with advanced features for software defined cloud networking.

Arista 7300X Series switches come in 4 slot (8U), 8 slot (13U) and 16 slot (21U) chassis supporting combinations of up to:

- 128/256/512 x QSFP+ at 40G (enables up to 512/1024/2048x10G ports via QSFP+ breakout to 10G.)
- 192/384/768 x SFP+ and 16/32/64 QSFP+
- 192/384/768 x 100/1000/10GBASE-T and 16/32/64 QSFP+

The initial set of 7300X linecards are:

- 32 x QSFP+ linecard / 128x10G linecard (each individual ports can be configured into either 1x40G or 4x10G mode)
- 48 x SFP+ and 4 x QSFP+ (QSFP+ ports can be configured into either 1x40G or 4x10G)
- 48 x 100/1000/10GBASE-T and 4 x QSFP+ (QSFP+ ports can be configured into either 1x40G or 4x10G)

The switch is modular and is highly available. There are redundant Supervisors, Fabrics, Fan modules and Power Supplies. Fans can be swapped individually without removing fabric modules.

The Arista 7250X is a purpose built 10/40GbE data center fixed configuration 2U switch with 64 x QSFP+ interfaces in a new category called Spline (combined Leaf and Spine.) These provide high density 1/10/40G in compact and energy efficient form factors, optimized airflow targeted for deployment as middle-of-row/end-of-row in server racks with wire speed layer 2 and layer 3 features, combined with advanced features for software defined cloud networking.

Featuring 64 QSFP+ ports in a 2RU form factor the 7250QX-64 switch delivers feature rich layer 2 and layer 3 wire speed performance with an overall throughput of 5.12Tbps. For configuration flexibility the 7250QX-64 supports up to 64x 40GbE ports or any port can be used as 4x10GbE for a 256x10GbE system. The Arista 7250X Series combine low latency from 550ns in cut-through mode, and a shared packet buffer pool of 12MB

per group of ports that is allocated dynamically to ports that are congested. With typical power consumption of less than 10 watts per 40GbE port the 7250X Series provide industry leading power efficiency. An optional built-in SSD supports advanced logging, data captures and other services directly on the switch.

What are the main differences in the 7300X family and 7250X switch over the 7050 and 7050X?

At a high level:

- Arista 7050 Series: Fixed configuration switch based on Trident+ silicon [single chip] up to 1280 Gbps
- Arista 7050X Series: Fixed configuration switch based on Trident2 silicon [single chip] up to 2560 Gbps
- Arista 7250X Series: Fixed configuration switch based on Trident2 silicon [multi-chip with dynamic fabric balancing] up to 5 Tbps
- Arista 7300X Series: Modular switch based on Trident2 silicon [multi-chip with dynamic fabric balancing] up to 10/20/40 Tbps

In terms of features, 7300X/7250X/7050X offers a number of enhancements over existing 7050 while maintaining feature consistency. This makes it an ideal option to expand, or upgrade existing solutions. For example an existing MLAG design can now scale up to 32 X the equivalent 7050S or 7050Q maximums, and take advantage of the new features. The 7250X and 7300X supports the following key new features:

- VXLAN bridging, routing and gateway for both virtualized and non-virtualized data centers
- LANZ - microburst and congestion monitoring
- DANZ - powerful flexible mirroring and a dedicated tap aggregation mode
- IEEE-1588v2 - PTP precision time synchronization
- Larger table sizes (L2, L3) - highly virtualized and large scale ECMP designs
- 64-way MLAG and ECMP - expanded scale out at leaf and spine
- ASU – Accelerated SW Update
- Resilient LAG and ECMP Hashing

What are the focus features of the 7300X and 7250X?

The 7250X and 7300X Series provide a number of advanced features for software defined cloud networking, high performance compute, big data and traditional data center applications.

Feature	Benefits
CloudVision	Network-wide workflow automation and workload orchestration as a turnkey solution for Cloud Networking
Wirespeed VXLAN Gateway	Seamless integration between VXLAN and L2/L3 environments, physical and virtualized networks for next generation data center designs
Tap Aggregation	Powerful tap aggregator that aggregates, replicates and captures traffic for processing without affecting production

IEEE 1588 PTP	Build and scale accurate timing solutions with sub-microsecond accuracy
Smart System Upgrade *	Optimized SW upgrades to reduce the impact of software upgrades and avoid network convergence
64-way ECMP and LAG	Improve network scalability and balance traffic across large-scale leaf-spine designs to over 200,000 ports, or provide efficient server load balancing
Resilient LAG Hashing / ECMP Hashing	Persistent hashing in the event of network link and topology changes to reduce disruptions and improve reliability
Latency Analyzer	A solution to improve monitoring and visibility at both 10G and 40G for congestion from persistent and short lived microbursts.
Cloud Control	Support for Openflow and OpenStack automation and self-service provisioning with cloud scale economics
Scalable Tables - ALPM and UFT	Flexible allocation of L2 and L3 forwarding table resources for greater design choice

What are the focus markets of the 7250X and 7300X?

1. single-tier Spline™ network designs:

If the longer-term requirements for number of ports can be fulfilled in a single switch (or pair of switches in a HA design), then there's no reason why a single tier *spline* design shouldn't be used. *Spline* designs collapse what have historically been the *spine* and *leaf* tiers into a single *spline*. Single tier *spline* designs will always offer the lowest capex and opex (as there are no ports used for interconnecting tiers of switches), the lowest latency, are inherently non-oversubscribed with at most two management touch points Flexible airflow options (front-to-rear or rear-to-front) on a modular spline switch mean it can be deployed in server/compute racks in the data center, with ports on the same side as the servers with airflow that matches the thermal containment of the servers.

2. spine layer in spine-leaf designs:

For designs that don't fit a single tier *spline* design then a two-tier *spine leaf* design is the next logical step. A two-tier design has spine switches at the top tier and leaf switches at the bottom tier with Servers/compute/storage always attached to leaf switches at the top of every rack (or for higher density leaf switches, top of every N racks) and leaf switches uplink to 2 or more spine switches. As many customers today successfully deploy the 7050 Series as the spine, there will be many scenarios where a 7050X, 7250 and 7300 Series are suitable for Spine tiers.

The Arista universal network architecture is optimized for all application types ranging from large cloud to enterprise deployments. The following are a selection of use cases:

- Grid / HPC - designs requiring cost effective and power efficient systems to enable non-blocking or minimal over-subscription networks
- Leaf-Spine - open standards based L2 and L3 with monitoring and visibility features - LANZ, DANZ, Tracers
- Software Defined Networking - with support for OpenFlow, DirectFlow, eAPI and VXLAN the 7050X Series are ideal for SDN use cases
- Enterprise access layers as middle of row or end of row supporting a wide range of 1G, 10G and 40G connectivity options allowing migration without fork lift upgrades
- Enterprise aggregation with full L2 and L3 features
- 40GbE attached storage - NFS systems requiring dense 40G, high performance and open standards
- ECMP designs up to 64-way - cost-effective using 7000 X-Series and 7500E Series

What EOS licenses are available and what features require them?

The 7250X and 7300X Series use the same license structure as other 7000 Series switches. Customers using licensed features must purchase the appropriate EOS licenses.

There are three licenses available for the 7250X and 7300X series, which align to the system density.

The Enhanced Routing License enables dynamic unicast and multicast routing protocols - OSPF, BGP (v4 and v6), PIM and NAT. (RIPv2 is supported without the Enhanced License).

The Virtualization License is required for the VM Tracer and VXLAN features.

The Network Monitoring and Provisioning (Z) License is required for ZTP, LANZ and Tap Aggregation features.

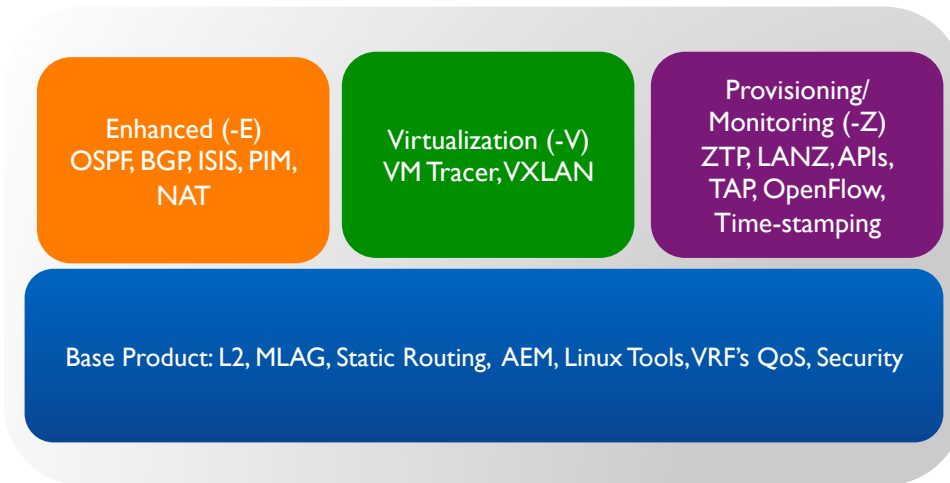
Feature	Product SKU	Platform
Virtualization feature license for Arista Fixed switches 144-256 port 10G (VM Tracer and VXLAN)	LIC-FIX-3-V	7250QX-64
Network monitoring and provisioning feature license for Arista Fixed switches 144-256 port 10G (ZTP, LANZ, TapAgg, API, Time-stamping)	LIC-FIX-3-Z	7250QX-64
Enhanced L3 License for Arista Fixed switches, 144-256 port 10G (BGP, OSPF, ISIS, PIM, NAT)	LIC-FIX-3-E	7250QX-64

Feature	Product SKU	Platform
Virtualization feature license for Arista Modular switches (VM Tracer and VXLAN)	LIC-MOD-1-V	7304
	LIC-MOD-2-V	7308
	LIC-MOD-3-V	7316
Enhanced L3 License for Arista Modular switches, (BGP, OSPF, ISIS, PIM, NAT)	LIC-MOD-1-E	7304
	LIC-MOD-2-E	7308

	LIC-MOD-3-E	7316
Network monitoring and provisioning feature license for Arista Modular switches (ZTP, LANZ, TapAgg, API, Time-stamping)	LIC-MOD-1-Z	7304
	LIC-MOD-2-Z	7308
	LIC-MOD-3-Z	7316

For more information on Arista licensing please refer to the official [licensing page](#).

The following image depicts the EOS license structure



How many ports does each of the switches have?

The 7250QX-64 has 64 40GbE QSFP+ ports.

The 7300X Series supports a wide variety of 10GbE and 40GbE interfaces:

- 128/256/512 x QSFP+ at 40G (enables up to 512/1024/2048x10G via QSFP+ breakout to 10G.)
- 192/384/768 x SFP+ and 16/32/64 QSFP+
- 192/384/768 x 100/1000/10GBASE-T and 16/32/64 QSFP+

What speeds do the 7250X and 7300X Series ports support?

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

Platform	1/10G Only	40G Only	4 x 10G or 1 x 40G
DCS-7250QX-64			All
DCS-7300X-32Q	--	--	All
DCS-7300X-64S	Ports 1 – 48	--	Ports 49-52
DCS-7300X-64TS	Ports 1 – 48	--	Ports 49-52

How do I change the QSFP+ ports between 10GbE and 40GbE modes and what is the default?

Multi-purpose QSFP+ ports can be used as either four 10GbE ports or a single 40GbE ports.

By default they will operate in 4x10 mode, as shown below:

```
Et3/1  notconnect  1          full  10G 40GBASE-SR4
Et3/2  notconnect  1          full  10G 40GBASE-SR4
Et3/3  notconnect  1          full  10G 40GBASE-SR4
Et3/4  notconnect  1          full  10G 40GBASE-SR4
```

To migrate the links to a single 40GbE interface, use the following command on lane 1 of the physical port.

```
7250QX64(config)#interface ethernet 3/1
7250QX64(config-if-Et3/1)#speed forced 40gfull
```

Note: When in 40GbE mode lanes 2-4 will show as err-disabled, as seen in the following output:

```
Et3/1  connected  in Po101  full  40G 40GBASE-SR4
Et3/2  errdisabled 1          full  10G 40GBASE-SR4
Et3/3  errdisabled 1          full  10G 40GBASE-SR4
Et3/4  errdisabled 1          full  10G 40GBASE-SR4
```

What sort of latency figures can I expect on the 7250X and 7300X series?

The 7250X and 7300X support both cut-through and store-and-forward modes depending on the nature of the source and destination interfaces and configuration. In cut-through mode the 40G to 40G latency is consistently below 2 microseconds.

For a detailed description of the forwarding modes check the 7250X and 7300X architecture white paper.

What are the advantages of buffer allocation on the 7250X and 7300X series?

The 7250X and 7300X series provides a best of both worlds approach to buffering. Combining a shared/dynamic buffer architecture with a small segment size, which together are designed to ensure maximum efficiency by minimizing ‘unusable’ buffer space.

What are the maximums for forwarding tables on the 7250X and 7300X Series?

The 7250X and 7300X Series support comprehensive L2 and L3 resources optimized for data center deployments:

Resources	Base Mode	UFT Mode
MAC Addresses	32K	288K
IPv4 Hosts	32K	208K
IPv4 Routes - Unicast	16K	144K*

IPv4 Routes - Multicast	16K	104K
IPv6 Hosts	16K	104K
IPv6 Routes - Unicast	8K	77K *
IPv6 Routes - Multicast	4K	No Change

Maximum values dependent on shared resources in some cases

* Supported in a future software release

What is the power draw on the 7250X and 7300X Series

The 7250QX-64 has a typical power consumption of just 622W, which is below 10W per 40GbE port. The maximum power measured, with fully loaded ports and at its maximum operating temperature is 946W or under 15W per 40GbE port. The 1100W PSU can draw up to 1190W in the worst case and power should be provisioned based on the max rated capacity (approximately 1200W) or based on local electrical codes. The 7300X Series draws under 3W typical per 10GbE port, and under 5W maximum per 10GbE port.

What efficiency rating do the new power supplies have?

AC Power supplies for both the 7250X and 7300X have an efficiency of over 93% - which equates to a platinum rating.

What are the high availability options?

The Arista 7250X 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 2RU and 7300 Series
- EOS Zero Touch Provisioning (ZTP)
- Self-healing software with Stateful Fault Repair (SFR)
- Multi-chassis LAG for active/active L2 multi-pathing
- 64-way MLAG and ECMP routing for all-active L2 and L3

The Arista 7300 Series offers all the same high availability options with some additional features:

- Dual hot-swap and redundant supervisor modules
- N+N hot-swappable power supplies
- Hot swap and redundant fabric modules
- Multiple redundant and individually hot swappable fan modules

Which cables and optics can be used?

All currently supported SFP+ and QSFP+ transceivers are supported on the Arista 7250X and 7300 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.

What is the minimum EOS software version for the Arista 7250QX-64 and 7300X Series?

The minimum version of EOS that supports the Arista 7250QX-64 is 4.13.0F and 7300 Series is 4.13.1F.

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.arista.com/en/service>.

Where do I get more information on the Arista 7000 X Series?

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