

## Product Highlights

### Density and Performance

- 36x100GbE on a 1RU line card
- Scales to up to 576 wire speed ports of 100GbE MACsec in a 7500R system
- Full IEEE 100GbE support
- Wire speed L2 and L3 forwarding
- Broad connectivity with 100G QSFP pluggable optics

### Wire-speed Encryption

- IEEE 802.1AE MACsec encryption
- 100G wire speed encryption on every port
- Cost and performance optimized for Data Center Interconnect (DCI) and Leaf-Spine to transport massive volumes of traffic securely

### Highly Scalable

- Compatible with all 10G, 40G and 100G line cards for 7500R Series
- Up to 576 100GbE line rate ports per switch
- Deep packet buffer (up to 24GB per line card)
- Virtual Output Queues per port to eliminate head of line blocking
- Pluggable optics for pay as you grow

### Virtualization and Provisioning

- CloudVision
- VXLAN for next generation DC
- LANZ for microburst detection
- VMTracer
- Zero Touch Provisioning(ZTP)
- Advanced Event Monitoring
- sFlow (RFC3176)
- IEEE 1588 PTP

### Cloud Networking Ready

- 768K MAC addresses
- Over 1M+ IPv4 Routes

### 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 phenomenal growth in demand for bandwidth, driven by mobile, video streaming and cloud applications, is driving the need for connecting several geographically separate data centers to maintain seamless content delivery and provide application agility. One of the major challenges for data center operators is to protect the data from passive wire tapping, intrusion and other attacks. To keep up with the global growth of inter-site bandwidth, interconnecting these data centers has to be operationally simple and economically efficient while also ensuring security.

Traditional transport infrastructure cannot meet the density challenge and most existing encryption solutions require additional systems that are expensive to deploy and manage so deploying bulk data center encryption is challenging. The Arista 7500R Series 100G MACsec line card provides IEEE 802.1AE defined MACsec encryption at wire speed on all ports for the secure transport of data, without compromising on either density or performance.

The Arista high density MACsec solution is integrated to a 7500R Series 100GbE line card delivering un-compromised performance at an efficient cost point and is fully compatible with all other 7500R Series line cards. It utilizes proven encryption technology to protect traffic for simple, reliable and scalable data center interconnect and for securing links between tiers in leaf and spine data center designs. Flexible 100GbE QSFP pluggable optics ensures a broad choice of cost effective connections.



*Arista 36 port 100GbE line card with MACsec for 7500R*

## Arista EOS

All Arista products including the 7500R Series runs the same Arista EOS software, binary image simplifying network administration with a single standard across all switches. 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 together with stateful switchover without the loss of data plane forwarding.

Arista EOS enables advanced monitoring and automation capabilities such as Zero Touch Provisioning, LANZ, VM Tracer and Linux based tools to be run natively on the switch.

## Highly Scalable and Future Proof Architecture

The Arista 100G MACsec line card is supported in the Arista 7500R Series and compatible with all the available 10G, 40G and 100G line card offerings. The following 7500R chassis options are available:

- **7516R** a 16-slot 29 RU chassis that supports up to 16 line cards with both AC or DC power options
- **7512R** a 12-slot 18 RU chassis that supports up to 12 line cards with both AC or DC power options
- **7508R** an 8-slot 13 RU chassis that supports up to 8 line cards with both AC or DC power options
- **7504R** a 4-slot 7 RU chassis that supports up to 4 line cards with both AC or DC power options

The Arista 7500 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. As a result, the Arista 7500 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.

## 100G Wire-speed Encryption

The Arista 100G MACsec line card has built-in 100G wire-speed encryption on every port. Industry standard IEEE 802.1AE (MAC Security standard, referred to as MACsec) capabilities provide line-rate frame encryption and authentication for all traffic. This removes the need for additional encryption devices which ensures confidentiality as well as provides anti-replay protection and therefore confidence in the integrity of encrypted traffic. MACsec is a link layer encryption technology and operates at the speed of the Ethernet ports, providing high performance without the processing overheads associated with encryption options such as IPSec.

MACsec uses a long-term key to derive session keys used for encryption utilizing the MACsec Key Agreement Protocol per IEEE 802.1X-2010. Long term keys can either be statically defined or derived via RADIUS server(s)\*. Data is encrypted using the 128 bit or 256-bit\* GCM-AES-XPB block cipher suite.

MACsec encryption is a EOS licensed feature and requires a license file to enable the encryption feature. License information is included in the ordering information section of this document.

## Line Card Specifications

The Arista 100G MACsec line card delivers up to 7.2 Tbps of bandwidth with 36 ports of 100G QSFP interfaces. Full 100GbE standards support ensures interoperability and future proofing for next generation network architecture. Support for industry standard pluggable optics for both single and multi-mode fiber provide a wide choice of connection options.

All QSFP ports are capable of operating independently in providing a flexible combination of speeds and operating distances using Arista pluggable optics and cables. Each port is individually configurable for MACsec allowing a flexible combination of encrypted links and standard links.

Each 7500R MACsec line card contains up to 24GB of packet memory for approximately 40 msec of traffic buffer per ingress port and virtually eliminating packet drops in congestion scenarios. Line cards connects to all fabric modules in a non-blocking full mesh.

## AlgoMatch

AlgoMatch is a unique Arista innovation for modern cloud networks, combining both software and hardware to enable more flexible and scalable solutions for access control, policy based forwarding and network telemetry. By combining general purpose memory with advanced software algorithms AlgoMatch delivers higher scale, performance and efficiency with lower power and is more cost effective than traditional solutions. AlgoMatch provides a more efficient packet matching algorithm that in turn enables flow matching for access control, policy and visibility. The net benefits are a high performance policy engine with both increased functionality and scale in a cost and power efficient solution.

- AlgoMatch enables IPv4 and IPv6 access control at the same scale
- L4 rule ranges are programmed efficiently without expansion or reduced capacity
- Multiple actions can be performed on a single packet or flow
- User defined filters allow flexible packet classification based on offsets for custom actions
- Supports rich policy with consistent semantics that would exhaust classical resources

## 7500R Accelerated sFlow

sFlow is a powerful tool used commonly by network operators for advanced network telemetry, capacity planning, security analysis and quality of experience monitoring. All members of the 7500R Series enable sFlow utilizing the high performance CPU. Within modern high performance systems, traffic sampling requires the capability to both sample and process packet rates of hundreds of millions of packets per second. With the 7500R Series Accelerated sFlow feature the sampling and processing of flow samples into sFlow datagrams is handled via integrated sFlow engines capable of generating up to 1.6Mpps of sFlow data, and of supporting 1:1000 sampling rates on of full wire speed systems or even higher rates with selective sampling based on triggers and filters. All sFlow v5 information is included in the sFlow records ensuring integration with standard sFlow collection and analysis tools and no loss of key information.

## 7500R MACsec Technical Specifications

Line card Module	7500RM-36CQ <sup>E</sup>	7500R2M-36CQ <sup>E</sup>	7500R2AM-36CQ <sup>E</sup>
Interface	QSFP100	QSFP100	QSFP100
Max 100GbE Ports <sup>1</sup>	36	36	36
Max 40GbE Ports <sup>1</sup>	36 <sup>2</sup>	36	36
Packet Buffer	24GB	16GB	16GB
Weight	17.0 lbs (7.7 kg)	17.4 lbs (7.9 kg)	17.4 lbs (7.9 kg)
Typical (Max) Power <sup>3</sup>	782W (1,049W)	683W (941W)	801W (1085W)
AlgoMatch	No	No	Yes
Accelerated sFlow	No	No	Yes
Size (WxHxD)	17.5" x 1.75" x 23" (44.5 x 4.5 x 58.4 cm)		
Chassis Support	DCS-7516N, DCS-7512N, DCS-7508N and DCS-7504N, DCS-7508, DCS-7504		
Minimum EOS Version	4.18.1F	4.19.1	4.20.2

<sup>1</sup> MACsec encryption is not supported with DAC cables

<sup>2</sup> MACsec encryption can be used in 100G mode only

<sup>3</sup> Typical power consumption measured with DAC cables at 25C ambient with 50% load on all ports

<sup>E</sup> Product is subject to an End of Sale notice

### Environmental Characteristics

Operating Temperature	0 to 40°C (32 to 104°F) <small>Note 1</small>
Storage Temperature	-40 to 70°C (-40 to 158°F)
Relative Humidity	5 to 95%
Operating Altitude	0 to 10,000 ft, (0-3,000m)

Note 1. Higher power or reduced temperature range optics may reduce system operating temperature to 35°C (95°F)

### Supported Optics and Cables

Interface Type	40G QSFP ports
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) / 400m (OM4)
40GBASE-PLRL4	1km (1km 4x10G LR/LRL)
40GBASE-PLR4	10km (10km 4x10G LR/LRL)
40GBASE-LRL4	1km
40GBASE-LR4	10km
40GBASE-ER4	40km
100GbE	100G QSFP ports
100GBASE-SR4	70m OM3 / 100m OM4 Parallel MMF
100GBASE-XSR4	150m OM3 / 300m OM4 Parallel MMF
100GBASE-SWDM4	70m OM3 / 100m OM4 Duplex MMF
100GBASE-SRBD	70m OM3 / 100m OM4 Duplex MMF
100GBASE-LR	10km SM Duplex
100GBASE-LR4/LRL4	10km SM Duplex
100GBASE-LRL4	2km SM Duplex
100GBASE-XCWDM4	10km SM Duplex
100GBASE-CWDM4	2km SM Duplex
100GBASE-PSM4	500m SM Parallel
100GBASE-AOC	1m to 30m
100GBASE-ERL4	40km SM Duplex

### Product Number      Product Description

DCS-7500RM-36CQ-LC	7500R Series 36 port 100GbE QSFP100 with MACsec, wirespeed line card (Spare)
DCS-7500RM-36CQ-LC#	7500R Series 36 port 100GbE QSFP100 with MACsec, wirespeed line card (Ships in chassis)
DCS-7500R2M-36CQ-LC	7500R2 Series 36 port 100GbE QSFP100 with MACsec, wirespeed line card (Spare)
DCS-7500R2M-36CQ-LC#	7500R2 Series 36 port 100GbE QSFP100 with MACsec, wirespeed line card (Ships in chassis)
DCS-7500R2AM-36CQ-LC	7500R2 Series 36 port 100GbE QSFP100 with AlgoMatch and MACsec, wirespeed line card (Spare)
DCS-7500R2AM-36CQ-LC#	7500R2 Series 36 port 100GbE QSFP100 with AlgoMatch and MACsec, wirespeed line card (Ships in chassis)
LIC-MOD-1-MACSEC	MACSEC Encryption License for Arista Modular switches - Encryption with MACSEC capable Linecard

## Warranty

The Arista 100G MACsec Line card for 7500R Series switches and Arista Optical transceivers 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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