ARISTA

The Arista 7130 Series

The Arista 7130 Series combines ultra-low latency Layer 1 switching with programmable FPGA technology. The series contains:

- The 7130 Connect Layer 1+ network devices with port-to-port latencies as low as 4 nanoseconds.
- The FPGA-enabled 7130E & L Series which are programmable switches that can host up to 3 FPGAs and can be leveraged to run Arista's network applications.
- The 7130 network applications which feature capabilities for ultra-low latency multiplexing in as low as 39 nanoseconds (MetaMux), tapping, tap aggregation, and sub-nanosecond precise timestamping (MetaWatch) and low-latency connection sharing with enhanced security & privacy (MultiAccess). Arista also provides development toolkits & IP Cores for users to develop their own applications.

Layer 1+ switching devices

Arista's 7130 Connect Series Layer 1+ switches are powerful network devices designed for ultra-low latency of just 4 nanoseconds. Available in 16, 48 or 96 port device options, they combine a multitude of network functionality on a single device:

- Signal regeneration
- Media conversion
- Port mirroring
- Telemetry
- Dynamic patching/link management
- Layer 1+ statistics on every link

All network devices are deterministic with virtually undetectable jitter as they neither buffer or queue data, hence utilizing 100% of available bandwidth. The 7130 Connect Series platform is packet-aware providing comprehensive packet statistics, signal quality monitoring including eye diagrams, and diagnostics. Packet replication provides the ability to sniff packets without affecting the data path.

FPGA-enabled devices

Arista's 7130E & L Series devices leverage the latest FPGA technology to allow companies to develop and deploy cutting-edge network applications. Available in 32, 48 or 96 SFP+ port options, the FPGA-enabled switches include a host of functionality:

- Up to 3 FPGAs on a single device
- 5 ns layer 1 switching between network
- 3 ns latency from front panel to FPGA
- Various specifications for RAM, buffers, and transceivers
- Extensive development toolkits and low-latency IP Cores

All FPGA-enabled devices are optimized for Arista's high performance network applications and can equally be leveraged to run 3rd party partner applications. FPGA application developers can utilize the platform to deploy and deliver their performance critical apps. In addition to the market-leading FPGA functionality, the devices offer all of the Layer 1+ network functionality also found on the Connect series.

The MOS operating system

MOS provides a core set of features that are common across the 7130 platform. It is based on Linux and provides a command line and web interface as well as support for other management protocols. MOS provides a standard, mature and powerful platform with the commands, tools and packages such as syslog, net-snmp, daemons, RPMs, Bash, Python, authentication, and security.

Technical Specifications

Layer 1 network switches

7130 Connect Series	7130-16G3	7130-48G3	7130-96
Description	16 port Layer-1 Switch	48 port Layer-1 Switch	96 port Layer-1 Switch
SFP+ Interfaces (100M-11.3Gbps)	16	48	96
Port-to-Port Latency	4 ns	4 ns	6 ns
RU	1	1	2
Airflow	Front-Rear or Rear-Front	Front-Rear or Rear-Front	Front-Rear or Rear-Front
Power Supplies	Redundant AC or DC	Redundant AC or DC	Redundant AC or DC

FPGA-enabled network switches

7130E Series Devices

Model	FPGA	FPGA Quantity	SFP+ Ports	FPGA Ports	RU	ePCIE	PPS In/Outs	SSD Drive Bays
48EH	Xilinx Virtex® UltraScale+™ VU9P	3	48	56 central/ 14 leaf	1		x	

7130L Series Devices

Model	FPGA	FPGA Quantity	SFP+ Ports	FPGA Ports	Off-Chip RAM	RU	ePCIE	PPS In/Outs	Clock	SSD Bay	Internal 10G Ports
48L	Xilinx Virtex® UltraScale ™ VU7P	1	48	60	4 x 8GB DDR4 2400 ECC	1		x	OCXO		x
96L	Xilinx Virtex® UltraScale ™ VU7P	1	96	58	4 x 8GB DDR4 2400 ECC	2		x	OCXO		x
32LB	Xilinx Virtex® UltraScale ™ VU9P	1	32	60	4 x 8GB DDR4 2400 ECC	1	x	x	OCXO	x	x
48LB	Xilinx Virtex® UltraScale ™ VU9P	1	48	60	4 x 8GB DDR4 2400 ECC	1		x	OCXO		x
96LB	Xilinx Virtex® UltraScale ™ VU9P	1	96	58	4 x 8GB DDR4 2400 ECC	2		x	OCXO		x
48LA	Xilinx Virtex® UltraScale ™ VU7P	1	48	60	4 x 8GB DDR4 2400 ECC	1		x	Atomic		x
96LA	Xilinx Virtex® UltraScale ™ VU7P	1	96	58	4 x 8GB DDR4 2400 ECC	2		x	Atomic		x
32LBA	Xilinx Virtex® UltraScale ™ VU9P	1	32	60	4 x 8GB DDR4 2400 ECC	1	x	x	Atomic	x	x
48LBA	Xilinx Virtex® UltraScale ™ VU9P	1	48	60	4 x 8GB DDR4 2400 ECC	1		x	Atomic		x
96LBA	Xilinx Virtex® UltraScale ™ VU9P	1	96	58	4 x 8GB DDR4 2400 ECC	2		x	Atomic		x

Network Applications

Arista offers several powerful network applications to simplify and transform network infrastructure. These applications are designed for use cases including ultra-low latency exchange trading, network visibility and providing vendor or brokerbased shared services. Network applications are supported on the Arista's 7130L Series of systems.

Application	Key Features	Use it for...
MetaWatch Advanced network monitoring	• Tapping • Large scale, lossless tap aggregation • Multi-port data capture • Sub-nanosecond precise time stamping • Deep buffering (32 GB)	• In-depth network monitoring and visibility • Improved network reliability & troubleshooting problems • Market data & packet capture • Accurate latency measurement & monitoring • Regulatory compliance (MiFID II - RTS 25)
MetaMux Low-latency multiplexing	• Data aggregation in 39 nanoseconds • Deterministic jitter • Packet statistics • BGP & PIM support	• Ultra-low latency network connectivity for trading • Market data fan-out and data aggregation for order entry at nanosecond levels
MultiAccess Connection sharing with enhanced security	• Low-latency multiplexing and security • ACL-based configurable filtering • Easy to deploy data privacy for connection sharing • Simplified footprint for both mux and filtering applications	• Secure network connection sharing • Providing sponsored access to multiple clients • Multi tenant exchange access • Low latency interconnect sharing

IP Cores and Development Toolkits

Arista provides a built-in application framework allowing developers to wrap applications into simple packages for deployment; streamlining operational processes. Arista development toolkits enable complete and unfettered access to the facilities provided by the in-system FPGAs. The MOSAPI provides monitoring, CLI, API, FPGA image management, and other facilities to allow application developers to concentrate on the core application functionality. These are the same APIs and developer kits used by the Arista engineering team to develop and deploy our applications.

Arista develops FPGA applications based on a mature base of network logic IP. To make it easier to develop compelling FPGA-based network applications, Arista licenses that IP as IP cores for use on the Arista 7130 platform. These are supported, proven building blocks that reduces time to implement your applications.

Core	Overview	Use it for...
10G MAC-PHY IP Core	An IP core for interfacing 10 gigabit Ethernet with low latency. • Implements a low latency Ethernet MAC and Physical layer (10GBASE-R) • Connects directly to FPGA top level serial transceiver pins and provides separate AXI4 interfaces for RX and TX user data • Supports Xilinx Virtex® 7, Xilinx Kintex® UltraScale™, and Virtex® • UltraScale+™ FPGA's.	• Accelerating your own applications access to the 10G network
Mux IP Core	Implements the same functionality as the Arista MetaMux application. • allows for customizable radix and number of multiplexing cores • e.g. one 4:1, plus a 13:1, plus a 14:1, etc	• Sharing the FPGA between the mux functionality and your own application • Building a multiplexing app with different configurations than the standard MetaMux application.
MMP IP Core	Provides a bus that leverages parallel I/O between FPGA's on the 7130 triple FPGA platforms • 8 ns intra FPGA latency • Provides a low latency clock domain crossing FIFO • Supports four MMP links connecting each Leaf FPGA to the Central FPGA and two MMP links connecting the two Leaf FPGAs together	• The lowest latency, parallel communications bus for your multi FPGA applications • •The fastest way to involve two FPGAs in a trading decision such as "splitting risk logic from trading logic".

Customer Testimonials and Use Cases

Tier 1 Investment Bank

Arista and Velocimetrics work together to enable a global investment bank to realise a more than tenfold improvement in tick-to-trade latency and implement an advanced monitoring solution to measure its entire network business flow.

Electronic Trading Firm

The Arista 7130 provides cost-effective access to exchanges at low nanosecond levels – providing the algorithmic asset manager 300 nanoseconds lower latency when sending messages from the trading server to the exchange in comparison to traditional network switches.

Deutsche Börse

DEUTSCHE BÖRSE GROUP

Arista provides lossless data capture, improved network monitoring and precision time-stamping of Deutsche Börse's co-location network – offering the exchange unprecedented insight into the network.

Santa Clara—Corporate Headquarters
5453 Great America Parkway,
Santa Clara, CA 95054

Phone: +1-408-547-5500
Fax: +1-408-538-8920
Email: info@arista.com

Ireland—International Headquarters
3130 Atlantic Avenue
Westpark Business Campus
Shannon, Co. Clare
Ireland

Vancouver—R&D Office
9200 Glenlyon Pkwy, Unit 300
Burnaby, British Columbia
Canada V5J 5J8

San Francisco—R&D and Sales Office 1390
Market Street, Suite 800
San Francisco, CA 94102

India—R&D Office
Global Tech Park, Tower A & B, 11th Floor
Marathahalli Outer Ring Road
Devarabeesanahalli Village, Varthur Hobli
Bangalore, India 560103

Singapore—APAC Administrative Office
9 Temasek Boulevard
#29-01, Suntec Tower Two
Singapore 038989

Australia - Sydney
Wynyard Green, Level 5,
11 York Street
Sydney NSW 2000