

SwitchApp

Low latency Layer 2
switching in less than 95 ns



< 95 ns
Latency



Deterministic



Layer 2
Switching

Arista SwitchApp is a full-featured 1/10/40G* Layer 2 switching app implemented in FPGA, optimised for low latency and integrated with the Arista EOS® (Extensible Operating System).

It delivers the convenience and simplicity of a traditional switch with the optimised latency and programmability of an FPGA-based system. SwitchApp runs on Arista's 7130LB devices, implementing a full Layer 2 switching pipeline for up to 48 ports. Rather than requiring a one-size-fits-all switch architecture, as would be necessary in fixed silicon, Arista's logic engineers have optimised several system profiles, each specifically tuned for the intended use case. The flexibility and programmability of FPGA fabric allows customers to obtain the best possible performance e.g. a simple L2 switch may achieve a lower latency than one that has more features. A switch with a low bi-section bandwidth achieves a lower latency than one with non-blocking bandwidth.

SwitchApp leverages the world's best network operating system – EOS – to provide access to a rich, and growing, set of features. As new features are added, the hardware logic can be updated, enabling entirely new use cases via a simple software update.

FEATURES*	BENEFITS
Low latency	Forward packets at an ultra low latency of 94 -132 ns** from any port to any other port. SwitchApp has been architected with latency as a first class design goal.
Bandwidth	Use the non-blocking bandwidth profiles to provide up to 480 Gbps between ports.
Full L2 Switch Pipeline	Implement a full-featured L2 switch pipeline, allowing for VLAN, Multicast, ACLs*, port aggregation and MLAG*. In use cases that don't require advanced L2 features, take advantage of a streamlined L2 profile to achieve the absolute lowest latency. <i>Full latency measurements are available for each build and each feature profile.</i>
EOS Integration	Take advantage of the familiar EOS configuration experience and feature set. Protocols such as RSTP, LLDP and IGMP work as per other traditional L2 switches. CLI, telemetry, counters, configuration automation and more are equally available.
CloudVision Integration	Extend the EOS-based switch to a network-wide model for provisioning, orchestration and telemetry. CloudVision acts as a unified control point for third party overlay controllers, orchestration systems and security platforms.
Scale	Use 10,000 Unicast MAC addresses or Multicast groups. Future updates will support: <ul style="list-style-type: none"> • Up to 2,000 L3 ACLs per port*; • 38,000 L3 routes*; • 4,000 NAT flows*.
FPGA-based	Leverage the re-programmability of FPGAs to optimise switching architectures to support different use cases. New feature requests, normally reserved for hardware updates, can be implemented via software update augmenting the functionality and extending the life of existing investments. Future improvements, delivered via software update, will include Layer 3 routing capabilities* (for example BGP, PIM, OSPF, VRRP), NAT* and IEEE 1588* (PTP boundary clock).
Layer 1 Integration	Keep the benefits of Layer 1 switching alongside SwitchApp. 7130 devices which support both SwitchApp and L1 switching can do both simultaneously. Use L1 switching to implement tapping, low-latency distribution and media conversion, all converged in the same device as the L2 switch.
Agile Ports	Adapt from 1G to 10G and 40G without costly upgrades.
Deterministic	Know and rely upon your system's latency for fairness, or implement an ideal execution environment for your orders. Full cut-through architecture in all profiles results in no latency variation with different length packets.

Optimized for

- Arista 7130LB devices with embedded Xilinx Ultrascale+ FPGA.

Use cases

- Multi-layer MLAG-based leaf-spine fabric, including redundant connections.
- Exchange-facing switch with multiple exchange connections, L1 tapping, and redundancy.
- Exchange-facing connectivity.
- L2 Aggregation for latency sensitive medium-large colo.
- L2 Multicast pub/sub.

Arista EOS

SwitchApp running on an Arista 7130LB device uses the same 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 multi-core x86 CPU subsystem.

Latency Profiles

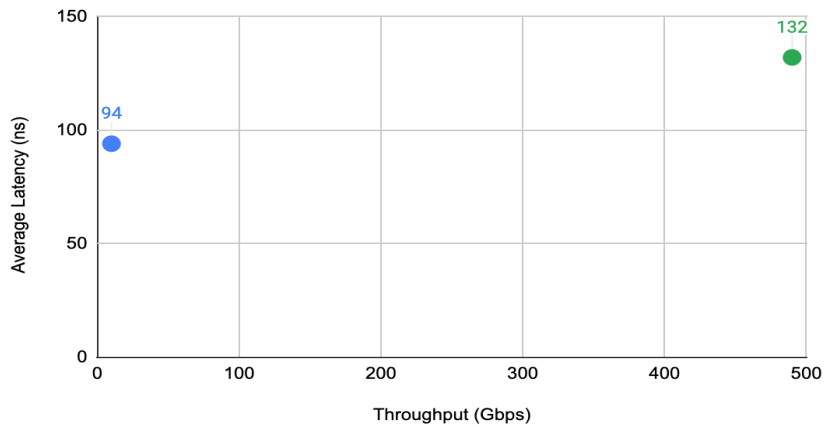


Table 1.1 SwitchApp measured latency for Layer2-Low-Latency and Layer1-Full
All latency numbers quoted are 10G to 10G.

* Roadmap features

** Average latency quoted

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