Arista Application Switch: Q&A

Q. What is the 7124FX Application Switch?

A. The Arista 7124FX is a data center class Ethernet switch based on the Arista 7124SX, our ultra low-latency L2/3/4 switching platform. It leverages the same 1RU power efficient form factor, redundant/hot swappable power supplies and fans. It provides 24 wirespeed, ultra-low latency 1 or 10Gb Ethernet ports using the flexible SFP+ form factor. Eight of the front panel ports route through a dedicated, user-programmable application switching subsystem where customers can load their own applications. The remaining sixteen interfaces route to the line rate, 480ns switching subsystem. The 7124FX switching subsystem provides deterministic latency and performance under maximum load, while also being able to run multiple applications and application routing concurrently.

Q. What does the FPGA subsystem include?

A. The user programmable FPGA subsystem is based on an Altera Stratix V FPGA and includes dedicated 8 GB of DRAM and 216 Mb of SRAM, and PCIe connectivity to the EOS subsystem. It has 8 interfaces connected to the internal switching subsystem, and is capable of 160Gbps of throughput. It offers over 6 million programmable logic gates to run low latency, high-performance applications. The FPGA subsystem also includes an external clock input. This provides access for external synchronization with PPS (Pulse per second) or IRIG (Inter Range Instrumentation Group) time sources, enabling nanosecond resolution instrumentation and time stamping of the data path.

Q. What value does the 7124FX provide over the 7124SX?

A. The 7124FX provides a platform where custom, high performance applications can be deployed directly and transparently in the network in addition to the standard Ethernet switching and routing functions. For traditional server application architectures, the 7124SX still provides the lowest latency L2/3/4 possible for standard switching and routing functions. The 7124FX is operated and instrumented like a standard switch (such as the 7124SX), allowing both to co-exist in a network.

Q. Where do I get applications for the 7124FX platform?

A. Customers can develop and integrate their own unique and fully custom applications into the Application Switch with the Arista FX Application Switch Development Kit, or can work with our application switch eco-system partners. Our eco-system partners provide solutions in 2 categories, "Appliance" and "System Integration". Appliance partners provide "turn-key" images that provide a defined set of functionality, and support for that image on the FX platform. System integration partners provide development environment support, pre

built IP blocks for TCP/UDP processing and financial protocols, and customer specific integration and production application support.

Q. Who are the applications partners for the 7124FX platform?

A. System Integration partners include Altera, Enyx and Impulse C who are providing IP cores, application consulting, and custom turn-key solutions for the 7124FX application switch platform for customers in the financial services, government, and HPC markets. Arista is also partnering to deliver off-the-shelf applications for the financial services market with Exegy to extend it's ticker plant appliance scale and functionality. We are also partnering with Novasparks who deliver a 100% hardware based market data solution. Additional development partners will be added to the eco-system.

Q. Does the 7124FX still run EOS?

A. Yes. The single EOS binary will also power the FX platform. It offers the highest levels of reliability, in service upgrades, and open source extensibility. In addition to this core functionality, features like LANZ and AEM provide proactive and automated management capabilities. On the 7124FX, EOS operates and instruments the external and internal ASIC and FPGA interfaces. It also provides an isolated operating environment for customer applications and an operational toolset for the programming and instrumentation of the FPGA subsystem.

Q. Where does the application execute?

A. The application itself is a microcode image that the customer or Arista partner develops. It is then loaded on the FPGA subsystem via EOS and provides the desired functionality directly in the data path of the switch. Non data-path operational applications for the FPGA programming, monitoring, and instrumentation can be run directly on the EOS software subsystem or in a KVM (Kernel Virtual Machine).

Q. Does this disrupt existing Arista partners like Palo Alto Networks, F5 Networks, and A10 Networks?

A. Not at all. Arista does not in any way dictate what a customer can, should, or must run on the FPGA subsystem in the Application Switch. In fact, we are actively encouraging any interested third party to develop on the Application Switch platform and combine their best-of-breed application and session layer products with the 7124FX hardware and Arista EOS. This powerful combination brings best-of-breed upper-layer capabilities with best-in-class network hardware and the most stable and flexible network operating system.

Q. Where in the network would the 7124FX be placed?

A. The low-latency, 1RU, high-bandwidth, low-power form factor makes the Arista 7124FX ideal for deploying at, or as close as possible to, the network edge. It includes a suite of network protocols for edge applications: BGP, OSPF, PIM, VRRP, IP ACL, MLAG and STP etc. It has a low power draw, optimized for deployment in colocation or distributed ground stations, along with a small form factor for space constrained environments.

Q. What are the target markets?

A. Financial Services, Government, and HPC are the initial targets. We envision that the Arista 7124FX will be most commonly used in financial applications, inline with the market and transaction data. This will enable an increased competitive advantage when coupled with our deterministic, ultra-low latency forwarding path and financial peering features set in EOS. In addition applications where the switch sits inline with data capture applications such as Signals Intelligence, Distributed Lawful Intercept, and Data Filtering are also suited for the deterministic performance of an FPGA.

Q. What types of financial applications are well suited for the 7124FX?

A. Market data arbitration and normalization, inline risk analysis, order gateways, order routers, as well as high resolution data analysis and time stamping are some of the financial applications that in whole or in part can be embedded into the network with the 7124FX.

Q. What type of customer should be buying the 7124FX? Who should not?

A. Customers that have in-house FPGA/Verilog development resources and expertise (common in Government, Federal systems integrators and defense contractors, and major financial trading operations). If the customer does not have internal expertise, they can engage with our eco-system partners to develop a custom application or purchase pre-built applications. This is a high-value platform that is not designed for everyone, and is not an appropriate fit for general purpose software based application development.

Q. What are the key problems it solves for customers?

A. The 7124FX gets the application as close as possible to the data on the network, increasing performance while reducing power, latency, and space while accelerating application execution with the on-board FPGA. It allows the customer to retain their intellectual property that they create their competitive advantage on without having to buy a pre-built and prescribed application or appliance. It also creates a vehicle to deliver advanced services inline that have previously only been able to be integrated into the network via bolted-on appliances that compromise the network architecture's reliability, survivability, and performance.

Q. Why Arista for this product?

A. Arista is providing a unique capability and performance that cannot be achieved by any other products on the market. The only way to create similar capabilities sacrifices latency, determinism, space, and power while increasing the complexity of the system or solution.

Q. What 7124FX features are common with the Arista 7124SX?

A. The Arista 7124SX and 7124FX have many common features including:

- 24 wirespeed 10GbE ports capable of supporting both 1G and 10Gb speeds

- Layer 2 and Layer 3 line rate performance
- IP Multicast protocols - PIM-SM and IGMP
- Ultra Low Latency @ ~480ns with minimal jitter
- Consistent EOS features for routing, switching and management including the Arista unique features - ZTP, LANZ, AEM, and VMTracer.
- Support for a 50GB SSD (optional on the 7124SX)

The Arista 7124FX unique features are the embedded FPGA subsystem, an accurate clock option and the PPS source input.

Technical Specifications:

Q. What is the minimum EOS software version for the Arista 7124FX?

A. The minimum version of EOS that supports the Arista 7124FX is 4.9.2.

Q. Is an EOS feature license required to enable the FX functions?

A. No new additional feature licenses are required to enable the embedded FPGA. Existing EOS licenses for dynamic routing, LANZ / Zero touch provisioning; and VMTracer are available for the Arista 7124FX.

Q. What are the high availability options?

A. The Arista 7124FX switch was designed for high availability from both a software and hardware perspective. Key high availability features include:

- 1+1 hot-swappable power supplies
- Four N+1 hot-swappable fans
- Live patching
- Self healing software with Stateful Fault Repair (SFR)
- Up to 16 10GbE ports per link aggregation group (LAG)
- Multi-chassis LAG for active/active L2 multipathing
- 16-way ECMP routing for load balancing and redundancy

Q. Does the 7124FX have AC and DC power Options?

A. The Arista 7124FX switch supports both AC and DC power options, which maximize the deployment options, and provides high availability with hot-swappable capability.

Q. Is this a store and forward or cut-through switch?

A. On the 16 front panel ports the Arista 7124FX switch utilizes a cut-through switch architecture which provides deterministic ultra low latency at ~480 nano-seconds for all packet sizes. The latency does not change

even when additional features such as L3 forwarding, L4 inspection, ACL, QoS, Multicast or Port Mirroring functionality are enabled. The 7124FX also forwards packets in cut-through mode at 1GbE speeds at low latency for legacy connections.

Q. How large is the packet buffer?

A. For the 16 front panel ports that are connected to the switching subsystem, the Arista 7124FX has a 2MB buffer with dynamic buffer allocation to optimize performance in micro-bursts. When there is a microburst of traffic from different sources, all destined to the same port, the packets are buffered in packet memory. Unlike other architectures that have fixed per-port packet memory, the 7124FX uses Dynamic Buffer Allocation (DBA) to allocate packet memory to ports that need it. Under congestion, a port can buffer up to 1.7MB of data in its transmit queue.

Q. What cables and optics can be used in the SFP+ ports?

A. All currently supported transceivers are supported on the Arista 7124FX SFP+ 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.

Q. How does the precision time option work?

A. The precision time option provides a high resolution clock on the EOS control plane. This allows the applications running in EOS to have a precise time value for instrumentation of application events on the switch and FPGA subsystem.

Platform Support:

Q. 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

Q. Do the development partners provide support options?

A. The 7124FX Application Switch Development Kit provides 15 hours of remote Impulse Factory Engineering assistance, or training. Additional support options are available directly from the development partners.

Q. Where do I get more information on the Arista 7124FX?

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