ARISTA

Cloud Builders

Hardware Update

Arista EMEA Cloud Builders Technical Forum – Spring/Summer 2019

Hardware Update - Agenda

- Hardware Strategy
- Data Center & Edge
- 400GbE and Optics
- Programmable
- Campus
- Appliances

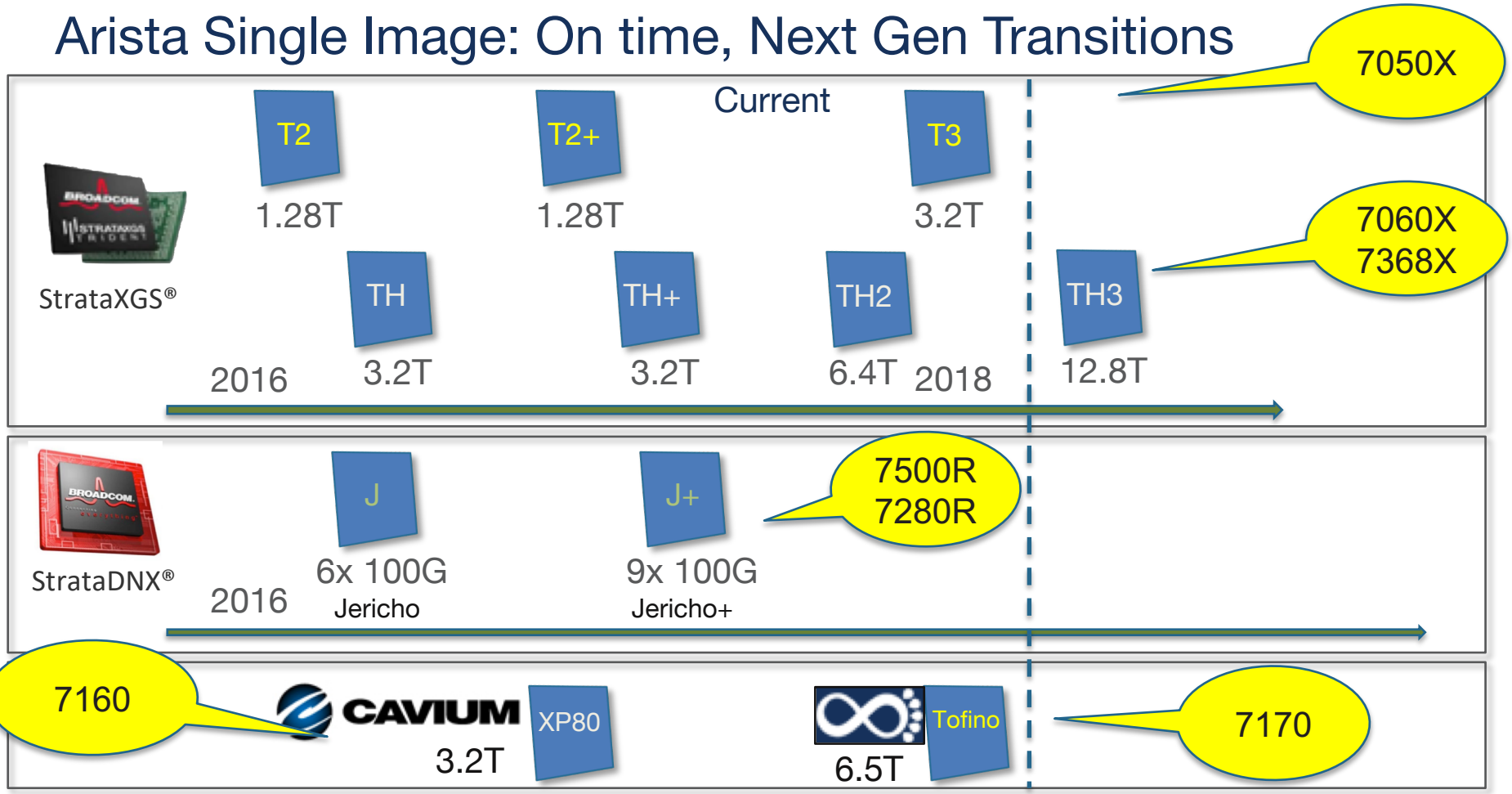
Hardware Update

Hardware Strategy

Arista's Hardware Strategy

- Use the best merchant silicon available
- Design for the datacenter, service provider and campus
- Build for scalable, high-performance networks
- Innovate to solve real world problems

Arista Single Image: On time, Next Gen Transitions

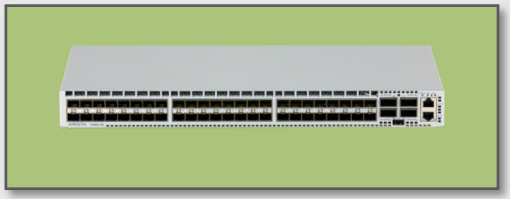


New family members

Hardware Update

Data Centre & Edge

Evolution of the Network Leaf – From 1G to 100G

2011- 7050 Series	2013 - 7050X Series	2018 - 7050X3 Series
		
64 ports 1.28Tbps	32 ports 2.56Tbps	32 ports 6.4Tbps
1/10G	10/40G	25/100G

Arista 7050X3 Series 25G/100G Systems

Flexible 25G and 100G Leaf

- Next Generation high performance systems
  - 6.4T of performance and 32MB of SmartBuffer
  - Consistent 7050X Series Features
  - Designed for 25G and 100G Migration
- Data Center Optimized
  - OSPF, BGP, Multicast & MLAG
  - Support for 384K routes, 128-way ECMP, 64 way MLAG
  - VXLAN routing in single pass in hardware
  - DLB optimized path and congestion avoidance
  - Comprehensive packet statistics and analytics
  - UFT mode for flexible topology choice

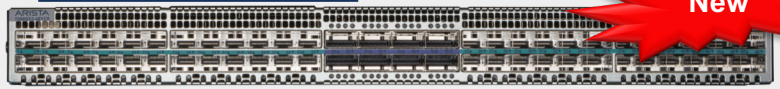
7050CX3-32S

32 Ports 100G – 6.4Tbps

7050SX3-48YC12

48 25G, 12 100G Ports - 4.8Tbps

7050SX3-48YC8



48 25G, 8 100G Ports - 4Tbps

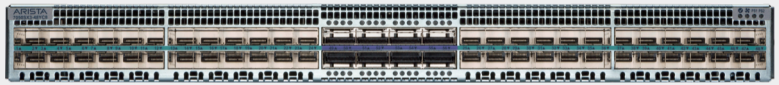
32x 100G, 32MB Buffer, Large Resources and IEEE 25G Support

Arista 7050X3-48YC8

1RU High Density Fixed 25G Leaf

- Server rack optimized front to rear airflow
- High performance servers – 1:1 subscription
- Full range of cables and optics:
  - 10G & 25G cables and optics 1.5W per port
  - Full range of 100G options up to 3.5W per port
- Comprehensive L2 / L3 Feature Support
- OSPF, BGP, Multicast & MLAG
  - Support for 384K routes, 128-way ECMP, 64 way MLAG
  - Dynamic Flow Distribution for large scale ECMP networks **
  - UFT mode for flexible topology choice
  - VXLAN Routing in hardware
- Hot-swap / redundant power supplies
  - AC and DC Power options
- Two hot-swap / redundant fan modules

7050SX3-48YC8



48 25G, 8 100G Ports - 4.8Tbps

Trident-3

Agile deployment of 1/10/25G

- Flexible 40/100G and 4x10G / 4x25G
- Flexible combination of 1/10G and 25G

Consistent certification, knowledge, sparing, and architecture

Arista 7020R Series – 1RU Fixed Systems

Deep Buffer System for Small Environments

- Choice: Consistent with 7500R and 7280R
- Flexible: Simple High Density Server ToR
- Wire speed L2 & L3 with VXLAN
- <4usec latency
- Ultra deep buffer – Up to 3GB
- Power Efficient under 4W per 10G port
- IEEE 1588 Support
- Front (Ports) to Back airflow and reverse
- Redundant power - Choice of AC or DC
- Hotswap Fans
- Compact Chassis form factors

7020TR/TRA-48

48x 100/1000Mb and 6 x 10G (SFP+)

7020SR-32C2

New

32x SFP+ and 2 x QSFP100
32x 1/10G and 2x 100G

7020SR/SRG-24C2

New

24x SFP+ and 2 x QSFP100
24x 1/10G and 2x 100G

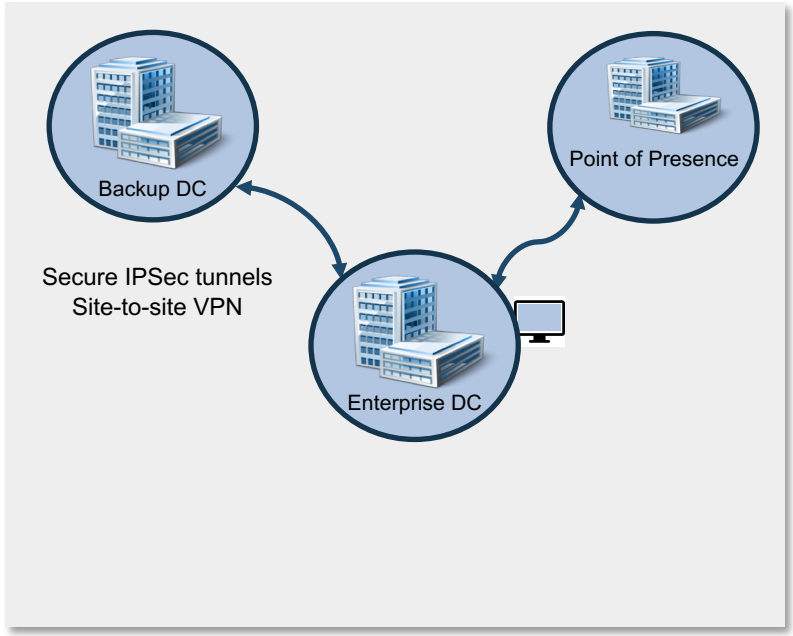
Consistent High Performance and Extensible EOS

Arista 7020SR/SRG-24C2 10G 1RU – Low cost, Low power

7020SR-24C2

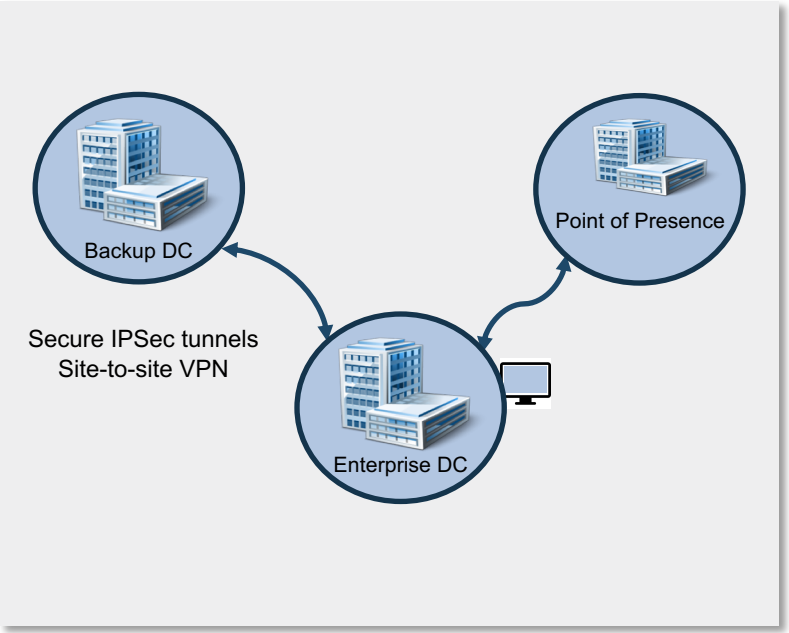
7020SRG-24C2

- 24 x 10G, 2 x 100G Interfaces
  - 1/10G on SFP+ and 10G to 100G on QSFP100
- High Performance and Scalable
  - Qumran-AX Based
  - Deep Buffers – 3GB
  - Throughput - 300Mpps, 440G
  - FlexRoute (200K) IPv4 Routes
  - 95W Typical Power, reversible power and fans
- Accelerated sFlow enabled
- No support for AlgoMatch
- IPSec ready (SRG) – site-to-site secure tunnels
- Features consistent to 7020TR Series



Arista 7020SRG Site to Site VPN

- High Performance IPSec Router
- Up to 20Gb of secure traffic
- AES-256 and SHA-256
- Up to 100 Tunnels
- Any physical interfaces
- Virtual output Queues and dynamic deep buffers
- Requires EOS IPSec License and Keys



Arista 7020R-32C2 10G 1RU – Compact form factor

10G Deep Buffer Router

32 x 1/10G and 2 x 100G

Up to 200K Routes with FlexRoute

Optimized for Class 2 cabinet

- Compact 1RU Chassis only 13” deep

Operational consistency with EOS and CloudVision

Lossless architecture and buffer monitoring use cases:

- General Purpose Compute
- IP Storage and Big Data
- Routing Solutions with FlexRoute
- Digital Media and Entertainment

Switching PPS	300 Mpps
System Capacity	1.04 Tbps
Buffer	3GB
ACLs	12K
MAC	256K
IPv4/v6 Hosts	80K / 80K
IPv4/v6 Routes	32K / 16K
FlexRoute v4/v6	200K / 200K
ECMP	128-way
Typical Power	Under 150W

Consistent High Performance and Extensible EOS

7280RK Series – 1RU – Fixed System with 2M routes

Expanded Range of Deep Buffer Systems for HPC and Storage Solutions

- Choice: Consistent with 7500R and 7280R
- Flexible: 10G/40G/100G and 40G/100G
- Enabler for Secure Leaf Spine designs
- Power Efficient under 3W per 10G port
- Wire speed L2 & L3 with VXLAN
- Large scale routing up to 2M routes
- Ultra deep buffer – 4GB DDR5
- Flexible Deployment Ratios: 10/25G &100G
- Full Internet Route Scale
- <4usec latency
- Reversible Airflow
- Choice of AC or DC
- 32GB DRAM options for FlexRoute

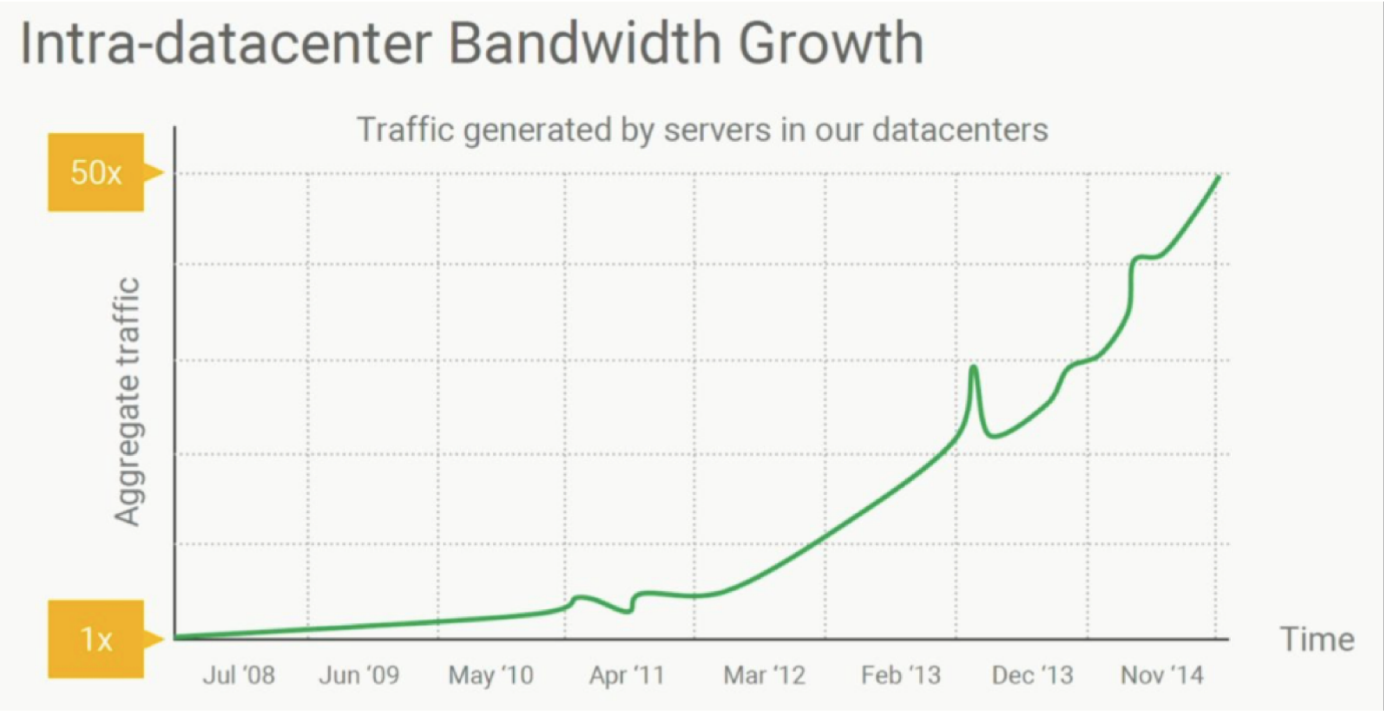
24x SFP+, 24x SFP28 and 6 x QSFP100
24x 10G, 24 x 25G and 6x 100G

Product	Interfaces	RU	Forwarding Rate	Throughput	10G	25G	40G QSFP	100G QSFP
7280SR2K-48C6	24 SFP+. 24 SFP28 / 6 QSFP100	1	837Mpps	2.88Tbps	48	24	6	6

Hardware Update

400GbE and Optics

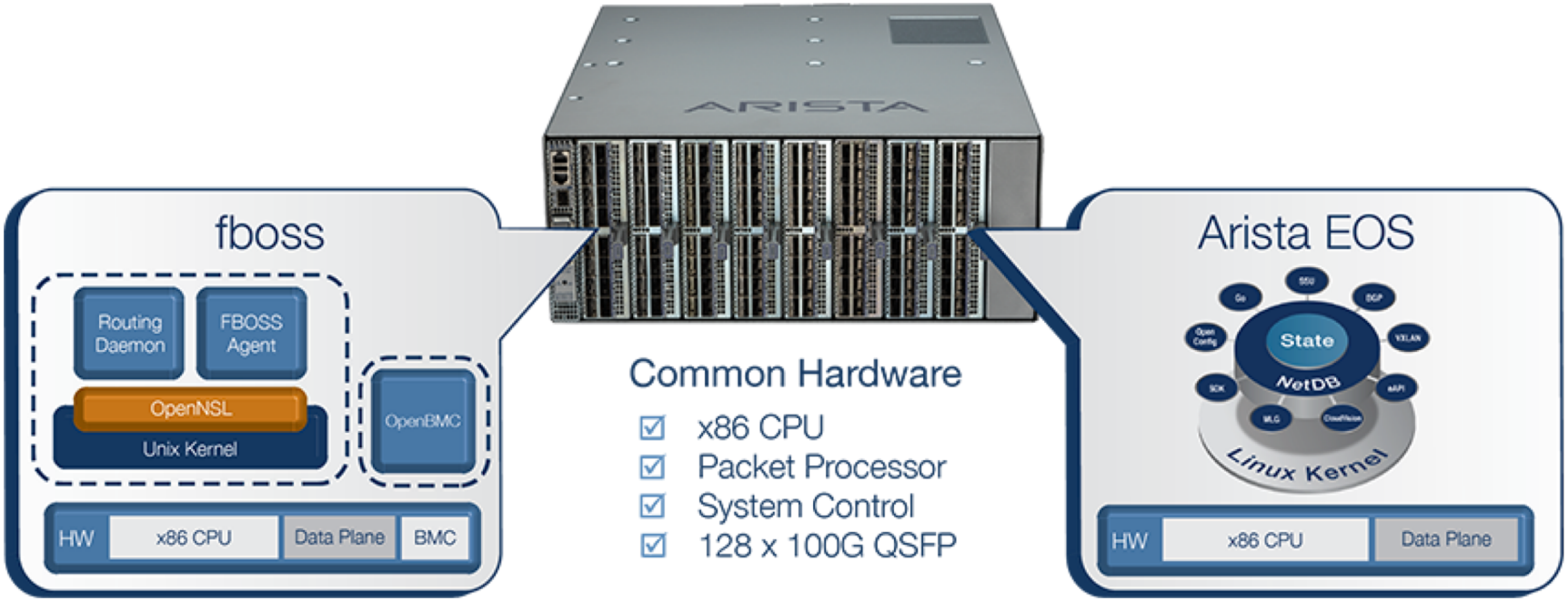
Cloud Network Bandwidth Demand Doubling/Year



Source: Urs Hoelzle, Google, OFC 2017

Driven by Flash IO, Serverless Compute, AI and ML

…Arista Introduces Open Cloud-Scale Platform..



Range of Systems for 100G/400G Scale-out Applications

7368X4

High Network Radix Modular System

- Choice of port module configurations
- Improved power efficiency per bandwidth
- Upgradeable to next generation
- 128x 100G QSFP or 32x 400G in 4RU

7060DX4-32

7060PX4-32

Efficient for density, performance and power

- Flexible 400G options with OSFP or QSFP-DD
- Ease migration to 400G with 128 x 100G mode
- Low Power, Latency and Scalable performance

Consistent Architecture with choices of industry standard interfaces

Arista 7368X4 Series 100G/400G

100/400G High Performance Semi-Fixed System

- High Performance 100G/400G system with hyperscale features
  - High Performance with 12.8Tbps and 8Bpps
  - Latency - 700ns port to port with cut-through mode
  - Shared 64MB Smart-buffer and monitoring with LANZ
- Datacenter Optimized
  - Datacenter Spine and next gen Leaf
  - Under 10W per 100G port typical to lower TCO
  - Increased routing scale and robustness
  - Elephant Flow Detector to automatically manage large flows
- Hyperscale Cloud Networks Scalability
  - OSPF, BGP, Multicast & MLAG - 400K routes, 128-way ECMP
  - Dynamic Load Balancing & Dynamic Group Multipath
  - Optimized hashing and ALPM for large scale IPv4 and IPv6

128 Ports 100G – 12.8Tbps

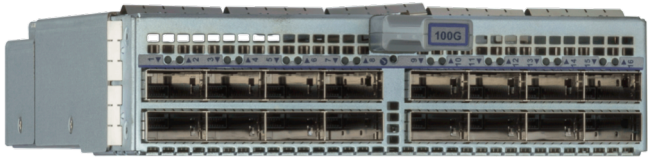
32 Ports 400G – 12.8Tbps

Tomahawk3

Consistent certification, knowledge, sparing, and architecture

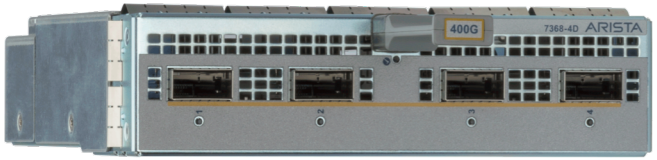
7368X – 100G and 400G Modules

- 16 x 100G Module
  - QSFP100 ports for range of cables and optics
  - Optional 200G Mode with Alternate ports
  - Hotswap with no power off
  - Integrated ejector and handle

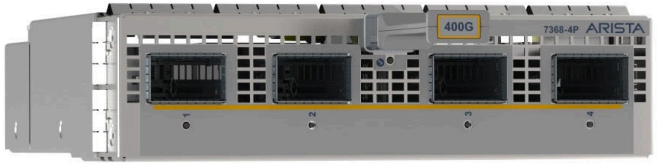


QSFP – 100G

- 4 x 400G Modules
  - QSFP-DD or OSFP
  - Widest range of cables and optics
  - Flexible 400G or 4x 100G (and 2x 200G) modes
  - Hotswap with no power off
  - Integrated ejector and handle



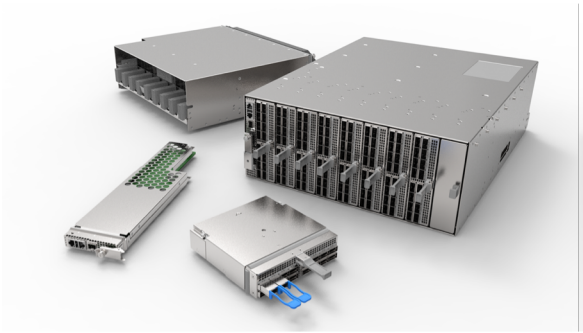
QSFP-DD – 400G



OSFP – 400G

7368X – Architected for Cloud Operations

- Switch Card – removes from rear without cable changes
- Management Module – removes from front
- Power Supplies – rear accessible and hot swap
- Fan Modules – individually removable and hot swap
- Choice of 100G and 400G Modules – mix and match



OSFP and QSFP-DD 400G Optics

Arista will have OSFP and QSFP-DD products

- Two connector standards: OSFP and QSFP-DD
- We prefer OSFP as it is technically superior
  - Higher power budget, easier to cool
  - More choices earlier in OSFP (not dependent on 7nm gearboxes)
  - More options for high-power optics (like ZR 120km 400g / ZR+ 1000km)
  - Supports 100G electrical which is the ***most*** cost-effective
- QSFP-DD is backwards-compatible with QSFP-100

Solution: OSFP-to-QSFP Adapter for 100G compatibility

- Inserts into an OSFP slot
- Lets you deploy a 400G switch and run it at 100G!
- Mechanical adaptor - purely passive

400G OSFP Optics

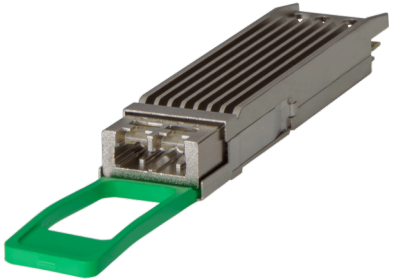
- 400G-SR8: up to 70m MMF
- Compliant to industry standards
- MTP-16 Connector

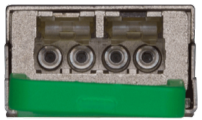
Standards Compliant

- 400G-DR4: up to 500m SMF
- Compliant to industry standards
- MTP12 Connector

Plug and Play

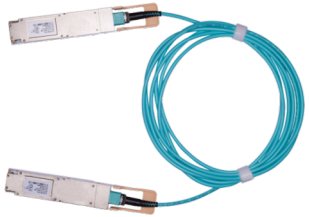
- 400G-2FR4: 2km-10km SMF
- Compliant to industry standards
- Dual SC (CS) Connector



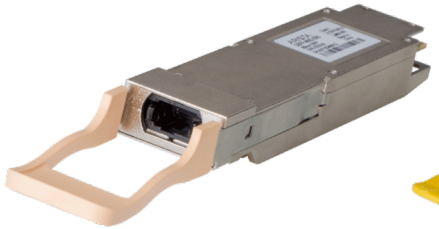


OSFP Form Factor

400G Optics breakout to 100G

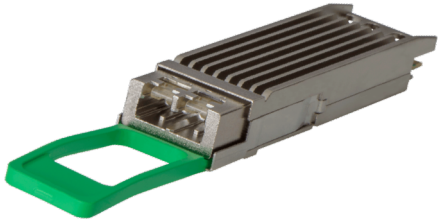


400G-AOC



400G-SR8

400G-DR4



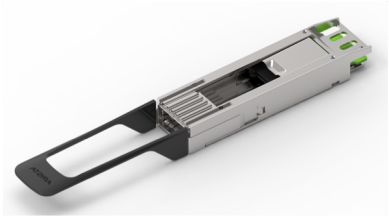
400G-2FR4

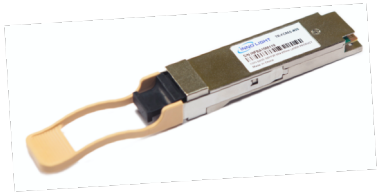
OSFP → QSFP Adapter

100G-SR4

100G-DR1

100G-CWDM4

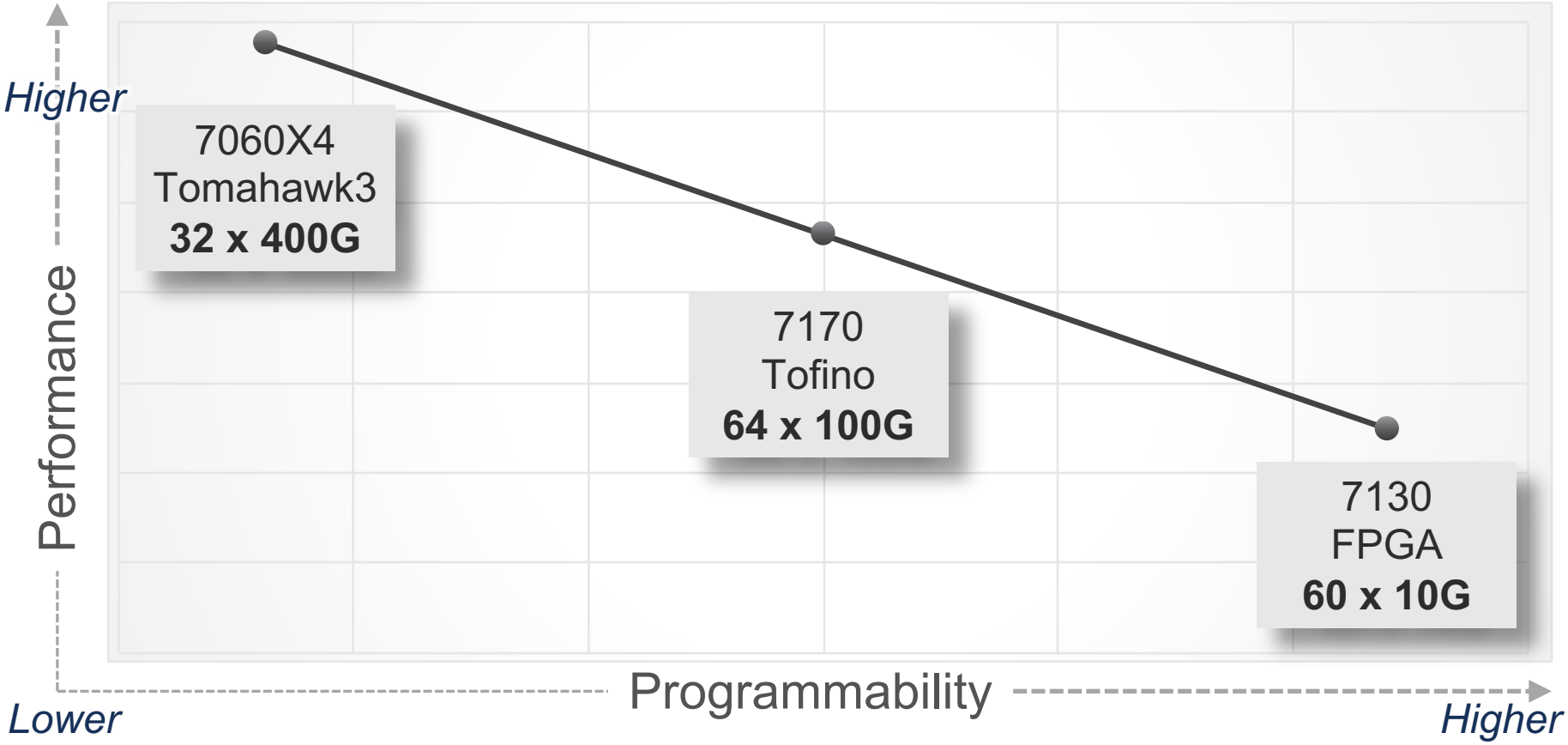




Hardware Update

Programmable

Performance *vs* Programmability

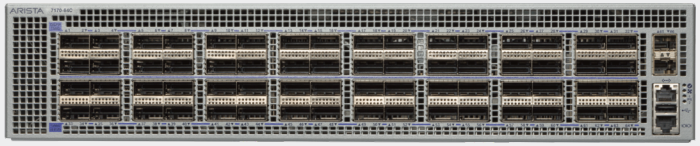


New 7170 Series 100G Systems

100G Programmable Spine

- High Performance 100GbE Systems
  - Up to 5Bpps Throughput
  - Shared 22MB buffer and monitoring with LANZ
  - Sub usec Latency
- Data Center Optimized
  - Data Center Spine and next gen Leaf
  - Under 12W per 100G port typical power
  - Flexible L2 and L3 tables
- Programmable Pipeline
  - Allows for flexible set of features and scale
  - CD variant offers dual processing pipeline for additional programming flexibility

7170-64C



64 Ports 100GbE – 12.8Tbps

7170-32C

32 Ports 100GbE – 6.4Tbps

7170-32CD

32 Ports 100GbE – 6.4Tbps

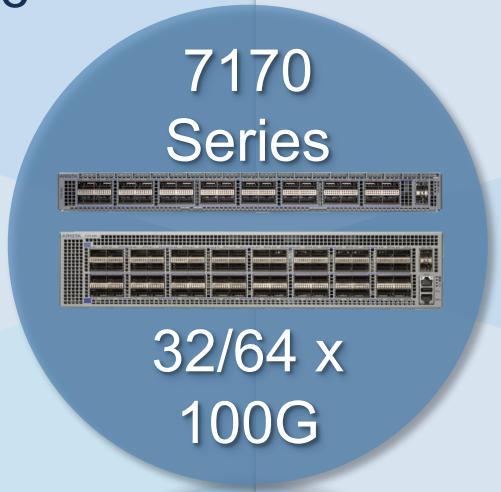
Flexible Pipeline for rich feature combinations and custom applications

7170 Series – A Multifunction Programmable Platform

Enhanced Tunnel Scale

Application Telemetry

Flexible Routing



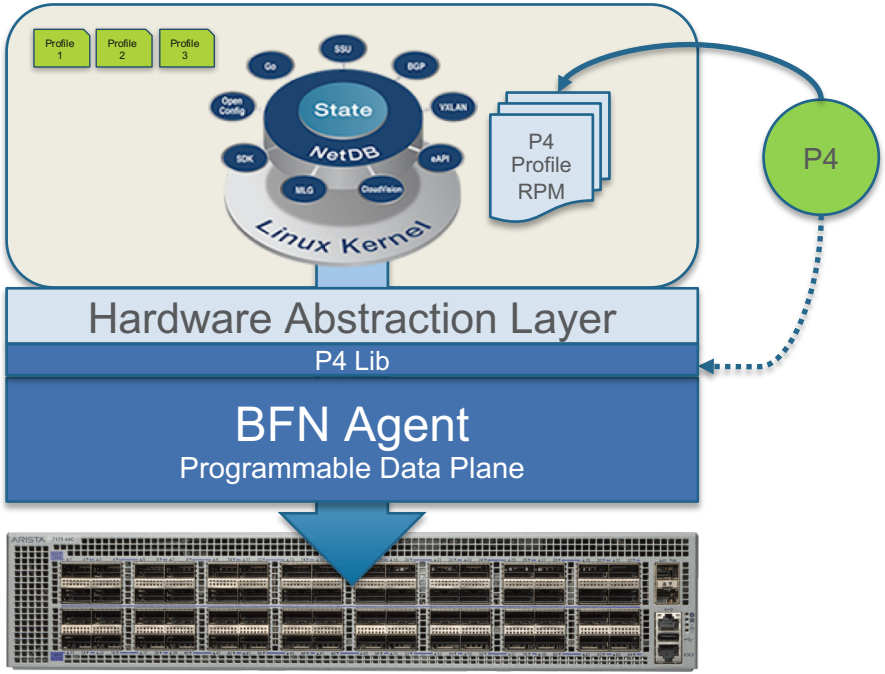
Network Security

Large Scale NAT

Large Scale ACLs

One Switch – Multiple Personalities

- Multiple Profiles Available
  - Hitless profile change, with brief processing pause
  - Cloud Profile includes many rich features for cloud deployment
  - Additional profiles add features or alter scale
  - New Profiles added via EOS upgrade or loading a new RPM
- Open up programming of unused stages, with customer contributing code
  - Requires engagement of Arista engineering
- Customers can develop in P4 and load directly into the system hardware
  - Customers can run locally developed code
  - Full Customization is possible



Loading new profiles

Install RPM

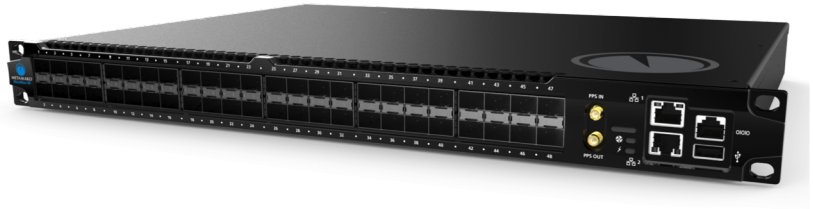
```
extension p4-nat.rpm
```

Load profile

```
platform barefoot profile NAT Bfn0
```

The NEW Arista 7130 L Series

- Go-forward platform choice for FPGA applications
  - Customers can choose which app to run
  - No longer need to buy application specific K or E Series devices
- Combines the best features of E-Series and K-Series into a single platform
- 32GB RAM with 3x memory access speed to allow for deeper buffering for MetaWatch
- Allows capture across all ports on 48 port device for MetaWatch
- More output ports for MetaWatch (4)
- Onboard OCXO by default
- Better FPGA's for faster MetaMux
- Consistent 32 & 48 port 1RU models
- Consistent 96 port 2RU model

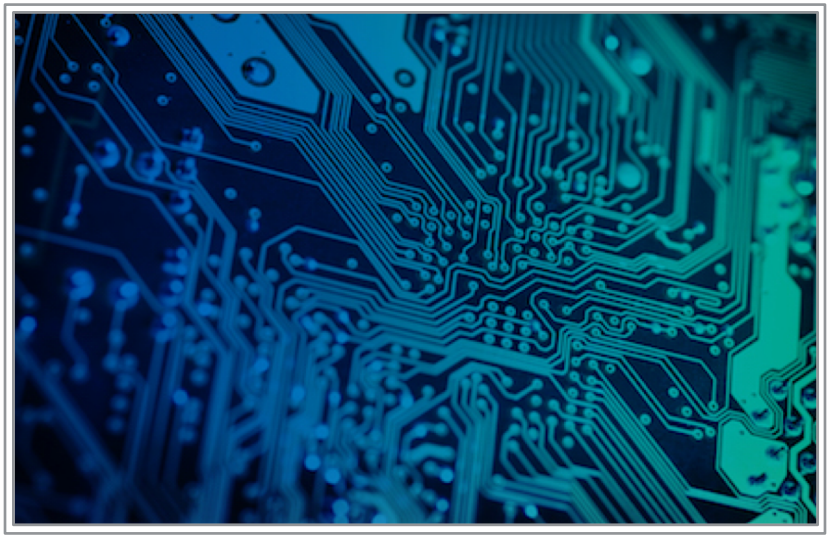


Arista 7130: Why 7130 series?

- Ultra low latency
  - Technology path for electronic trading applications and deployments
- Application freedom
  - Layer 1+ and FPGA allows for unlimited application possibilities
- Arista network applications
  - Supported applications for common use cases
  - Deploy high performance, precision FPGA applications without requiring FPGA development skills
- Development flexibility
  - Leverage Arista IP Cores and development kits

Arista 7130L Series: FPGA development

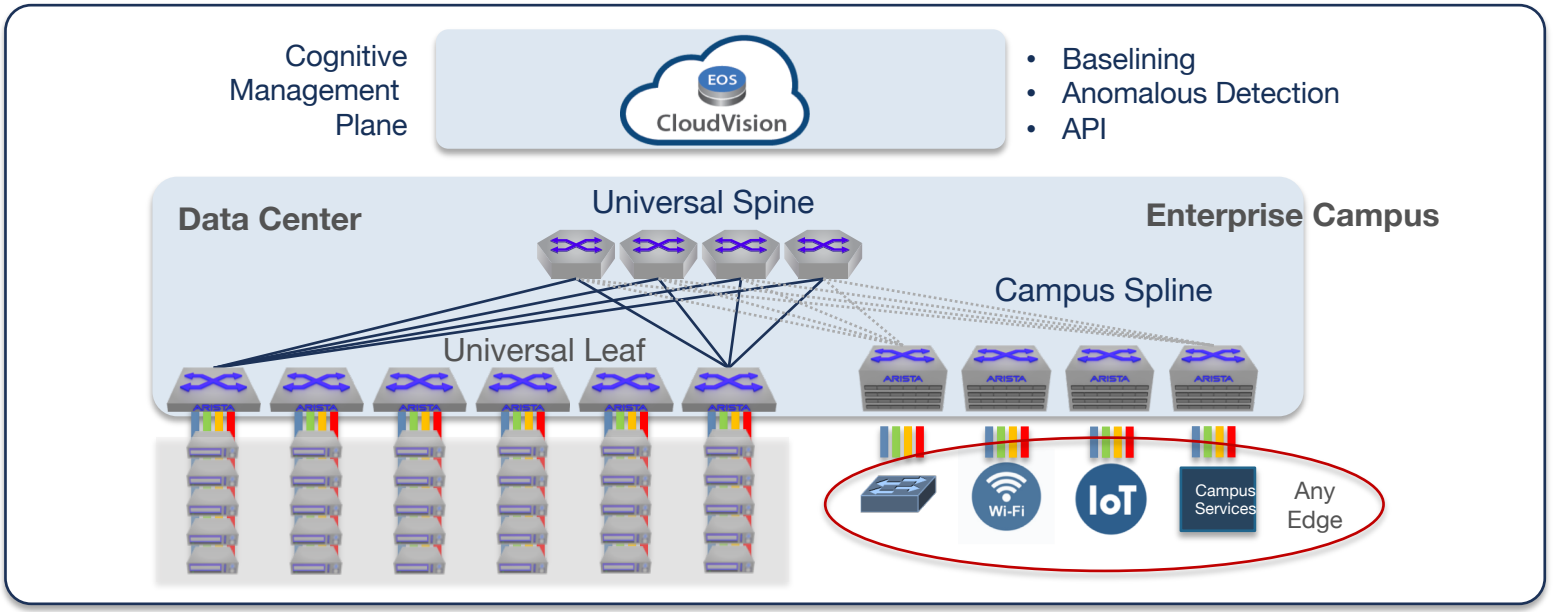
- Flexible custom application platform
- Development and deployment of custom applications
- Deployment of third party applications (e.g. Enyx)
- Leverage layer 1+ functions to provide operational visibility
  - Packet counters
  - Port replication
  - tcpdump
  - Eye diagrams
- Package as an application to simplify install
- Full access to FPGA with
  - Up to 60 transceivers connected
- Suite of IP cores to reduce development time

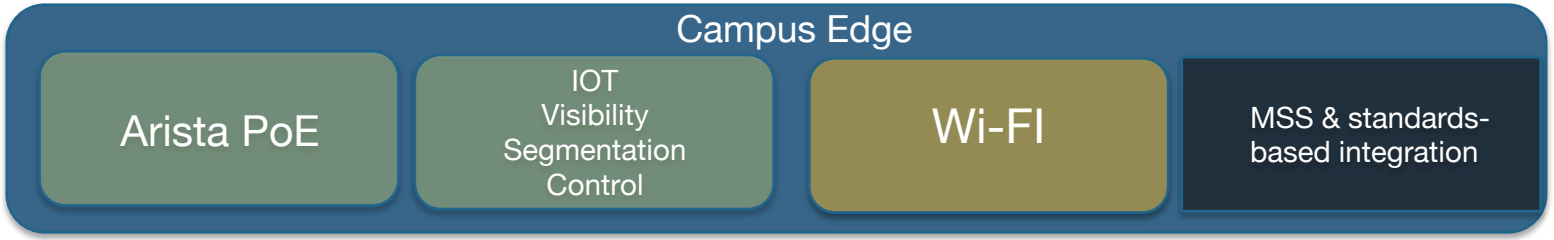


Hardware Update

Campus

Arista Cognitive Campus Strategy





Introducing Arista 7300X3 - Large/Medium Campus Spline

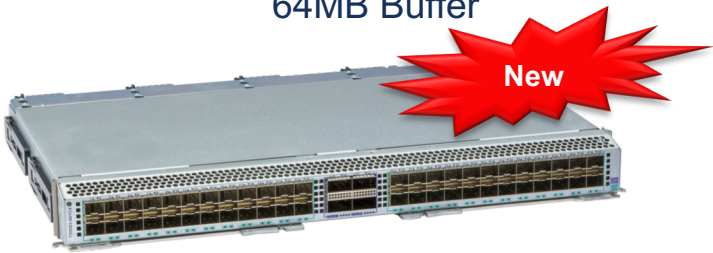
- High Density 100G/25G for Campus
- Two Chassis:
  - 4 and 8 slot options
  - 25 to 50Tbps Fabric
- Two Linecards:
  - 32x100G QSFP
  - 48xSFP-25G + 4x100G
- Single EOS image
- CloudVision & Cognitive Features

Arista 7300X3 Series Line cards

Flexible 25G and 100G Spine

- NEW - 7300X3 Series 32 100GbE ports
- NEW - 7300X3 Series 48 25GbE and 4 100G ports
  - DLB optimized path selection / congestion avoidance
  - Comprehensive packet statistics and analytics
  - VXLAN routing in hardware
  - Consistent 7300X and 7050X Series Features

7300X3-32C – 32 x 100G
64MB Buffer



7300X3-48YC4 – 48 25G, 4 100G
32MB Buffer

NEW - 7300X3 Series Fabric Modules

- Up to 6.4Tbps full duplex per line card slot
- Active-Active with graceful degradation
- 100Gbps connections to line cards

Arista 802.11ac AP Family- Disaggregated APs

O-105/E	C-100	C-110	C-120	C-130	W-118
					
• 2x2:2 MIMO 802.11ac • Wave 2	• 2x2:2 MU-MIMO 802.11ac • Wave 2	• 2x2:2 MU-MIMO 802.11ac • Wave 2 • Tri-Radio	• 4x4:4 MU-MIMO 802.11ac • Wave 2	• 4x4:4 MU-MIMO 802.11ac • Wave 2 • Tri-Radio	• 2x2:2 MU-MIMO • Wave 2 • Tri-Radio Wallplate
1x Gigabit Ethernet Port	1 x Gigabit Ethernet Ports	1 x Gigabit Ethernet Port	2x Gigabit Ethernet Ports	2x Gigabit Ethernet Ports	1x GigE Uplink 3x GigE Wired ports 1x Passthrough port
• Internal & external antenna options • Best for stadiums, outdoor spaces, weather-affected environments	• Low cost Wave-2 • Best for medium density, SMB, Retail, K-12	• Low cost Wave-2 • Best for medium density SMB, Retail, K12 Schools, Enterprise • Integrated BLE	• Latest QCA chipset • Best for high density, enterprise, classroom and auditoriums	• Latest QCA chipset • 2x2 ac 3rd radio for dedicated WIPS/RF monitoring • Best for high density, enterprise, classroom and auditoriums	• 2x2 ac 3rd radio for dedicated WIPS/RF monitoring • Best for conference rooms, classrooms, hospitality, dormitories, etc. • Integrated BLE

ARISTA

Hardware Update

Appliances

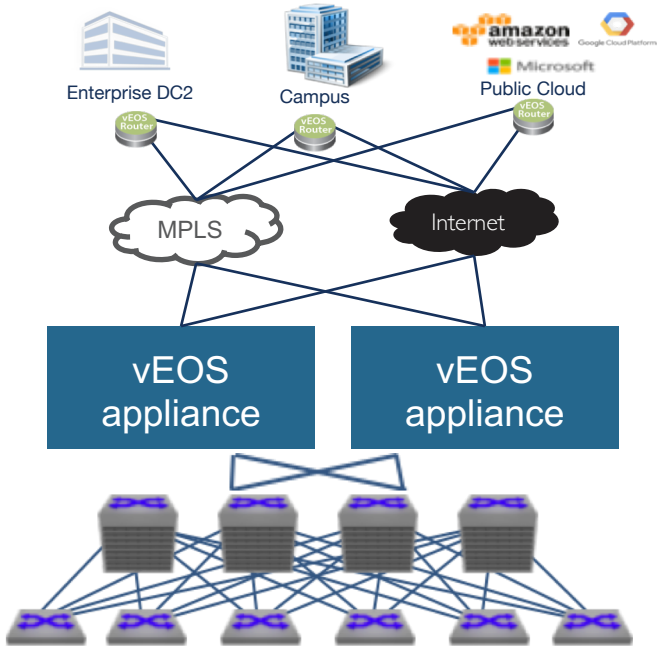
Introducing the Arista 200 Series Appliance

- Arista appliance available as an alternative to existing virtual appliances
- Two Offerings for the DCA-200:
  - **CloudVision**, including CVP, CVX, and AWM (WiFi) apps
  - **vEOS**, including vEOS Router and 10G NICs
- Software Subscription licenses purchased separately

DCA-200-CV
DCA-200-VEOS

vEOS Physical Appliance - DCA-200-VEOS

- vEOS (DCA-200-VEOS), including vEOS Router and 4x10G interfaces (2xNICs).
- One appliance supports up to 20 Gbps (IMIX) with 2 vEOS.
- Same server spec as CVA appliance.
- Software Subscription licenses purchased separately
- Supplied with the appliance…
  - OS & Hypervisor: Centos, KVM
  - vEOS image
  - Interactive Scripts: start a number of vEOS Routers with different flavors (CPU, memory, NICs and etc.)



Thank You