Обзор и позиционирование продуктов и решений Arista

ru-se@arista.com

Agenda

- Об Arista Networks
- Обзор решений
  - ЦОД
  - Корпоративные сети
  - TapAgg
  - Сети операторов связи
  - L1 коммутация
- Обзор линеек оборудования
  - CloudVision
  - Коммутация и маршрутизация в ЦОД (7050X, 7060X, 7300X)
  - Корпоративные сети (720XP, WiFi)
  - Универсальные маршрутизаторы (7020R, 7280R, 7500R, 7800R)
  - Коммутация начального уровня (7010)
  - L1 и FPGA коммутация (7130)
- Лицензирование
- Техническая поддержка

Об Arista

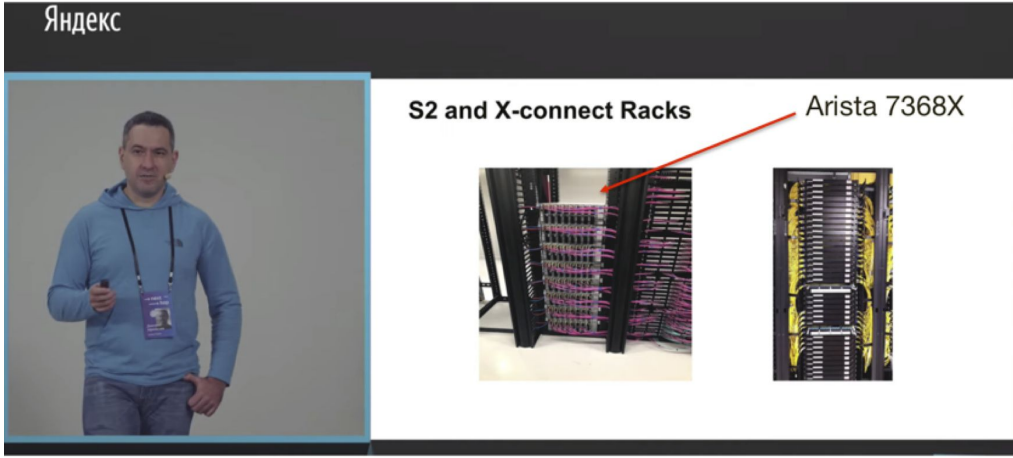
Arista Networks

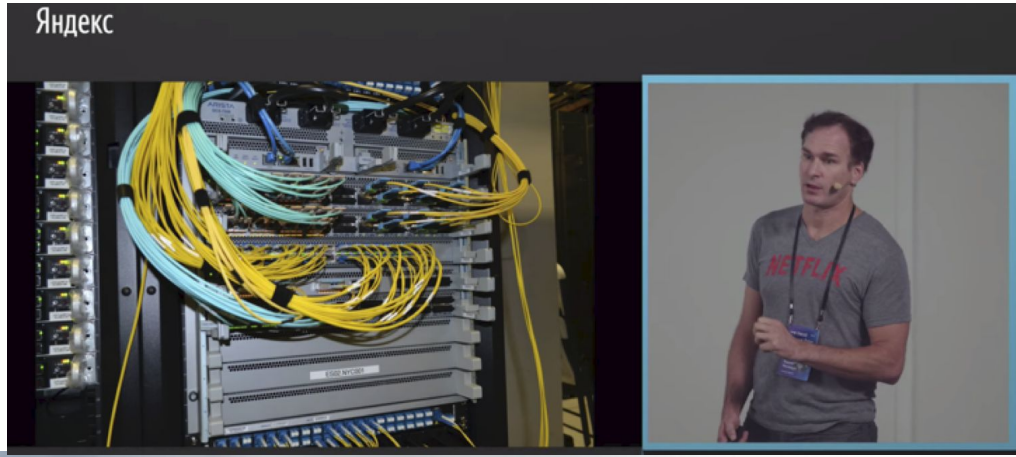
Факты

- Основана в 2004
- IPO в июне 2014
- Капитализация ~ 18 Млрд $
- Поставщик 5 из 6 глобальных «облачных» операторов
- В России и СНГ с конца 2011 (крупные инсталляции в России и СНГ)

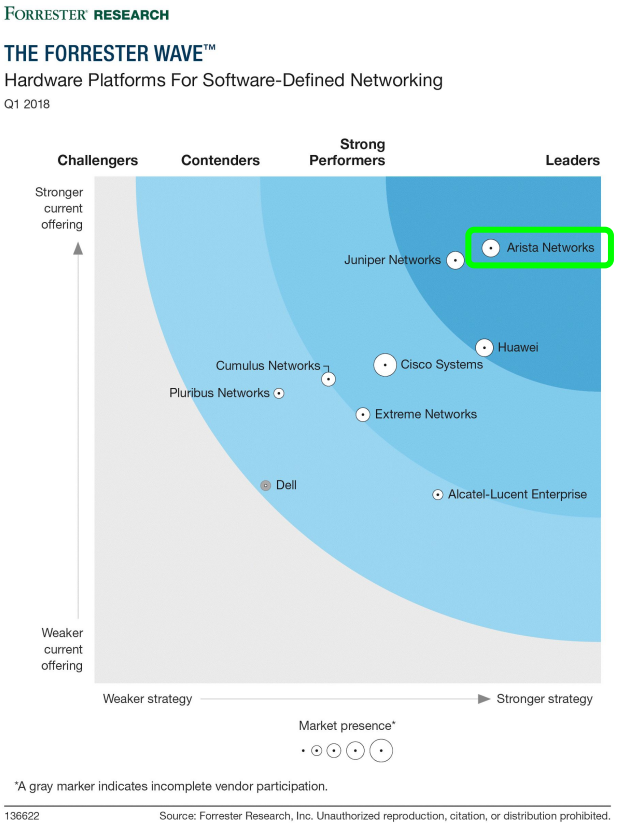
Yandex https://youtu.be/U86Xjx1rcHY?t=3214

Netflix https://youtu.be/U86Xjx1rcHY?t=13048





Arista - несколько лет подряд лидер в сегменте ЦОД



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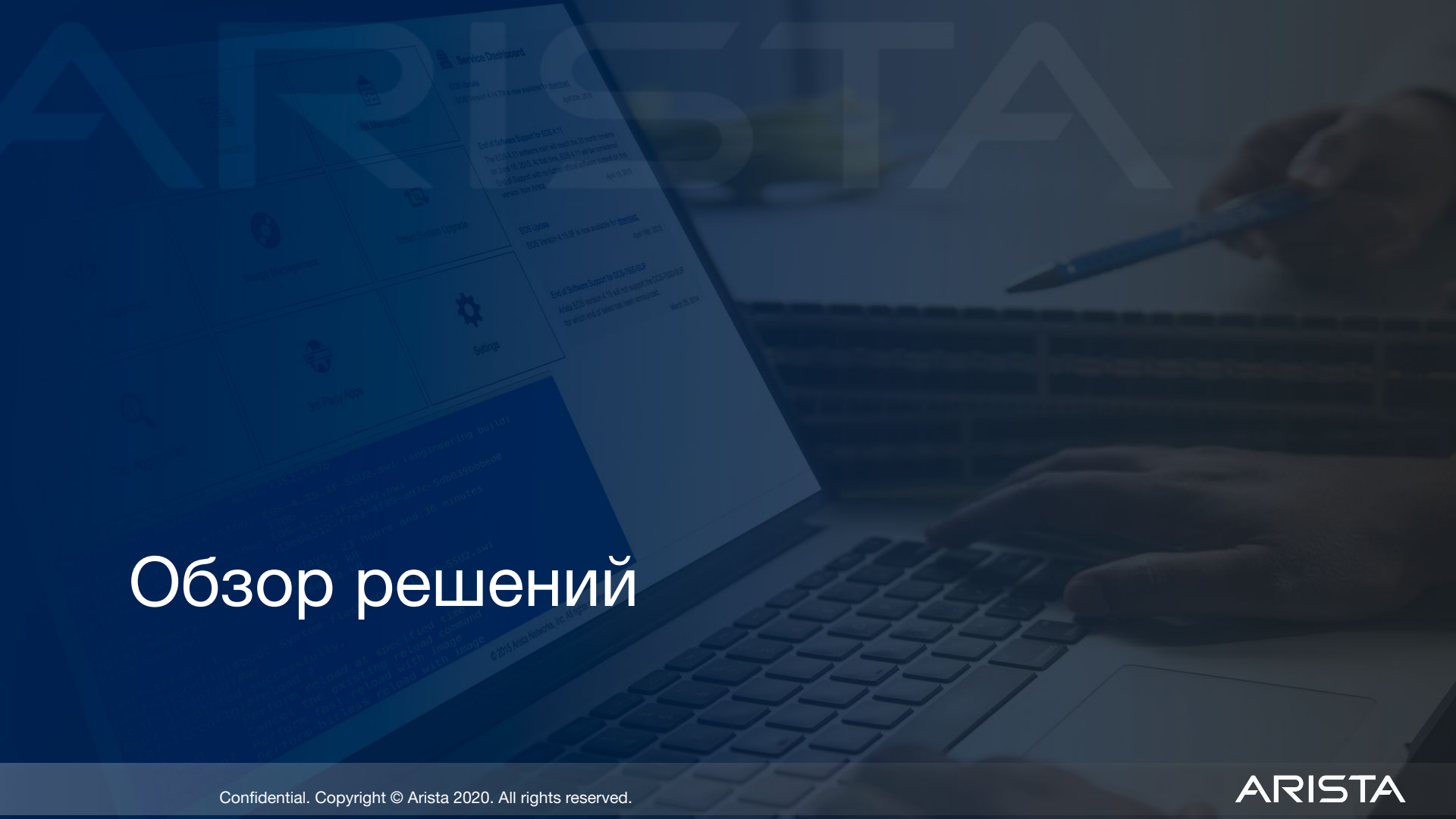
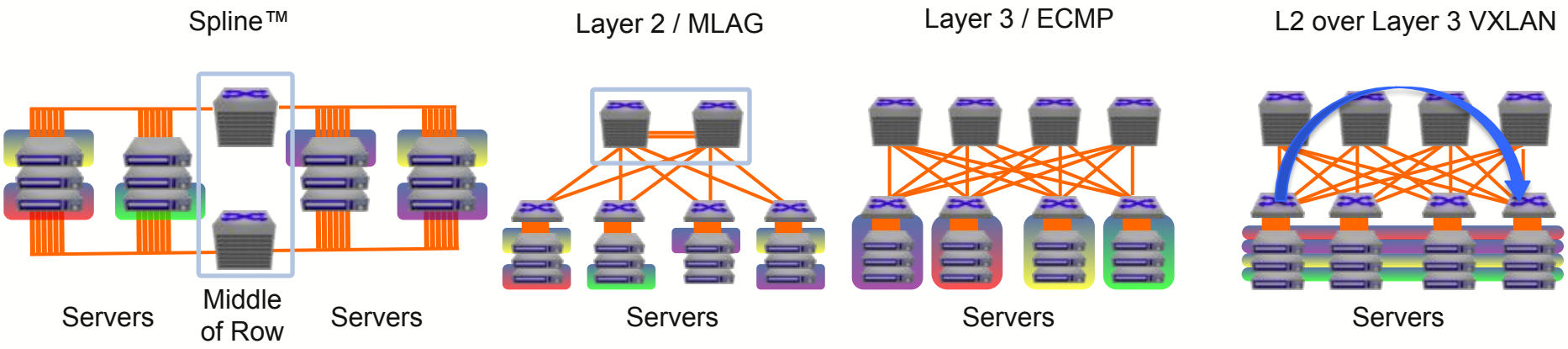


Обзор решений

ARISTA

Data Center Networking



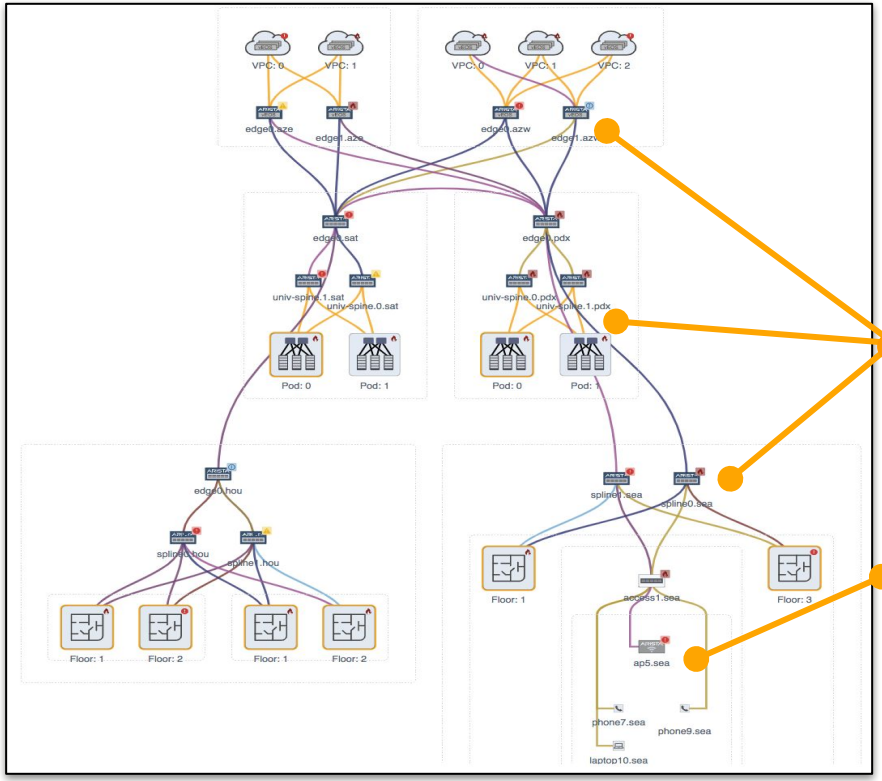
Server Scale:	100 to 2,000	100 to 10,000	100 to 100,000+	100 to 100,000+

CloudVision: Topology View

State Streaming-based
Modern, granular, complete.
(No Polling - at all!)

Overlay Telemetry Views
Performance, Events,
Segmentation and more

Starting Point...
For diving deeper into
control, data, mgmt plane



Single Management View
Consolidation of
DC + Campus + Cloud

Common Dashboard for Visibility
Wired and Wireless
3rd Party devices

Improved Visibility by Breaking down Silos

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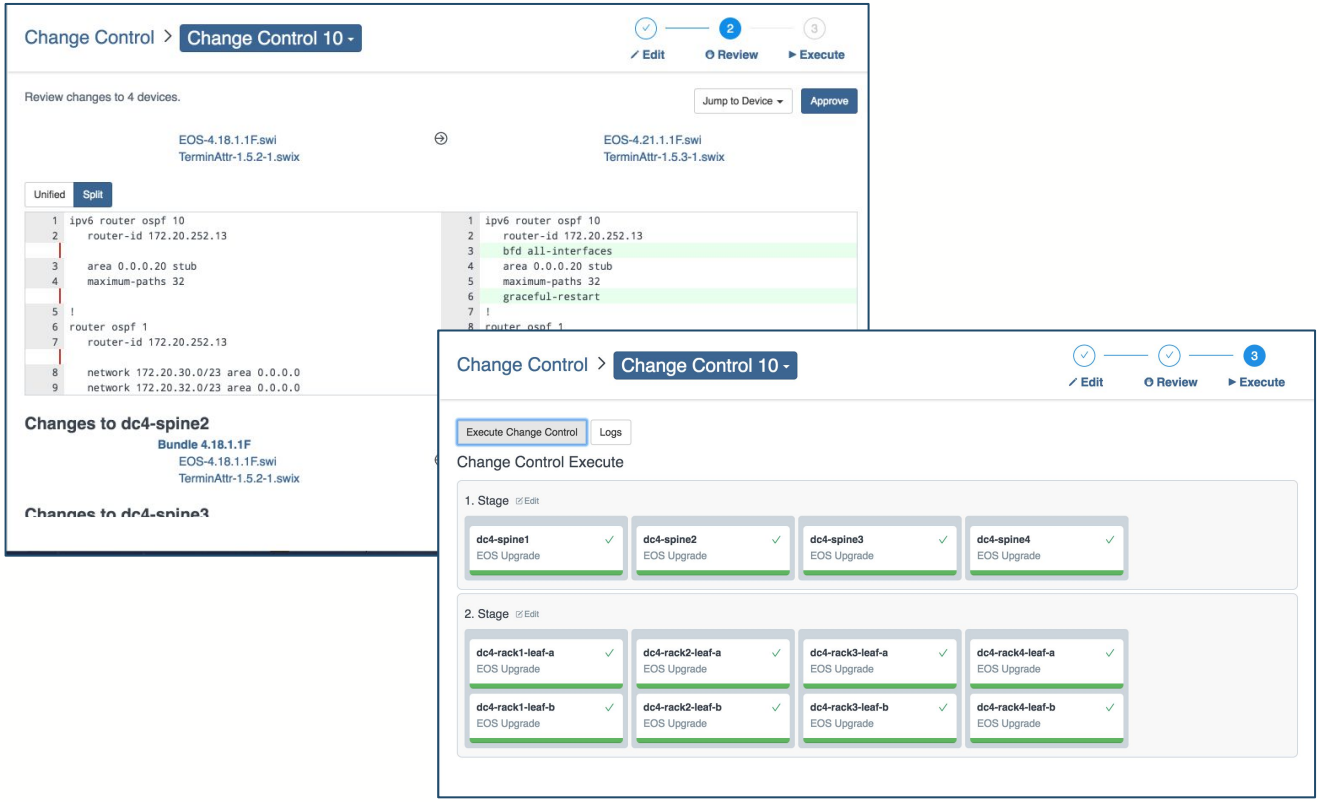
CloudVision: Change Control Management

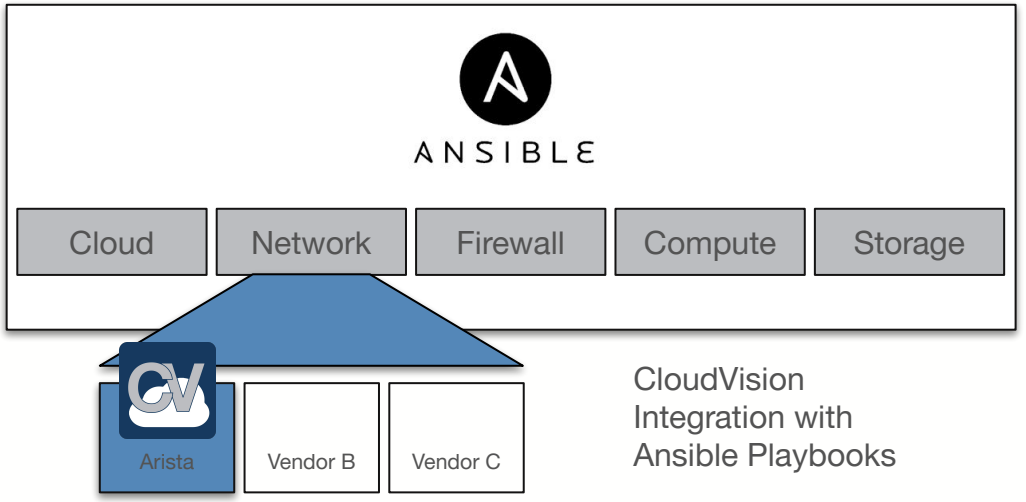


- New CVP infrastructure which is the basis for Snapshots, upgrades, rollback
- Based on the ‘Run-book’ model
- Adds the ability to order and schedule a group of tasks
- Monitor live progress of the change control

Co-ordinated automation of network-wide operations

Ansible Integration with CloudVision

- Ansible: Broad framework for infrastructure automation
- Use-case: Central source of network configuration truth
- CloudVision complements with broader functionality
- Benefits:
  - Common framework
  - Multi-vendor automation
  - Version control
  - Reduced human error with machine-generated configs

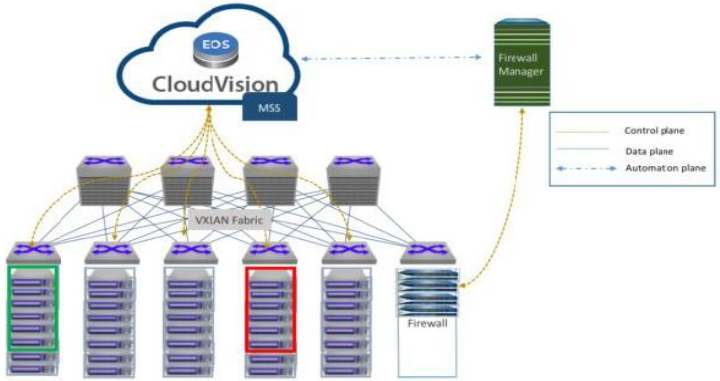


CloudVision Integration with Ansible Playbooks

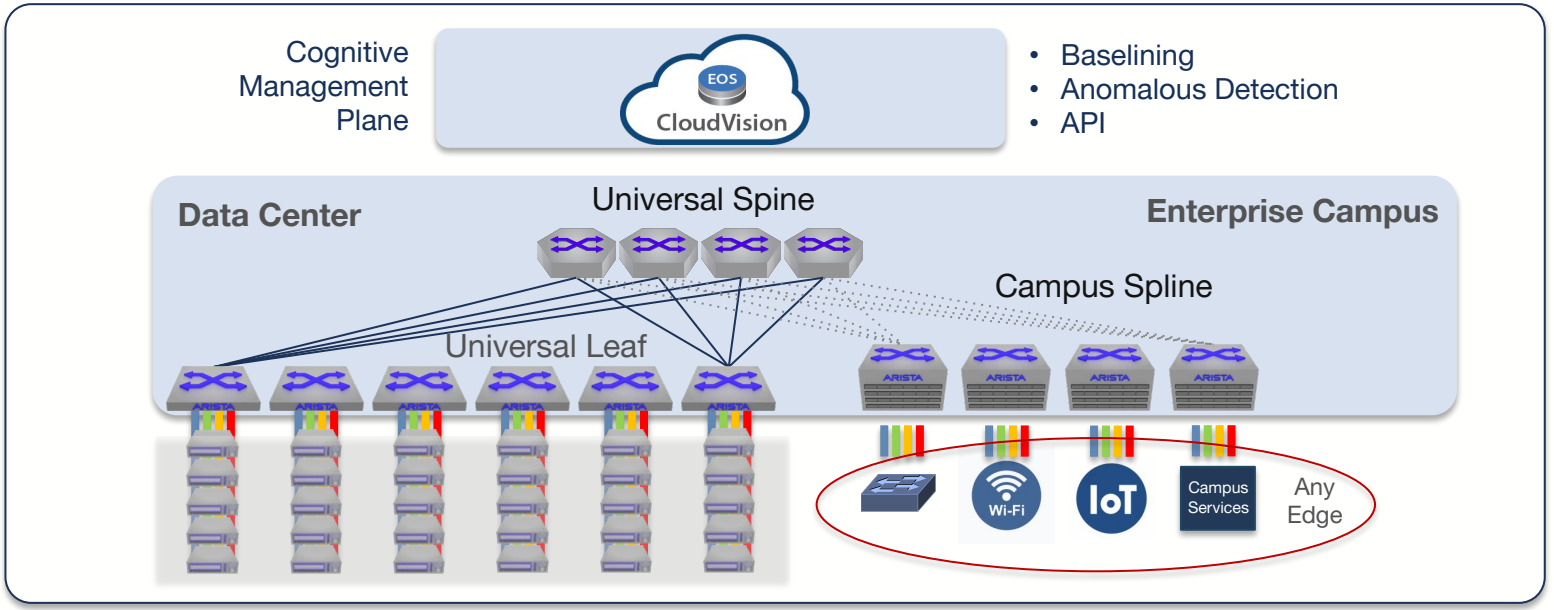
Arista's Ansible Repository
https://github.com/aristanetworks/ansible

Macro-Segmentation Service (MSS)

- **Dynamic**
  - Insert security between any data center physical and virtual workload
  - Automatic and seamless service insertion
  - Follows host / application throughout the network
- **Open**
  - No proprietary frame formats
  - Works in multi-vendor network architecture
  - Open APIs
- **Ecosystem**
  - Works with leading Security, Cloud Orchestration and Overlay Controllers
  - Integration with Palo Alto, Fortinet, Checkpoint



Arista Cognitive Campus

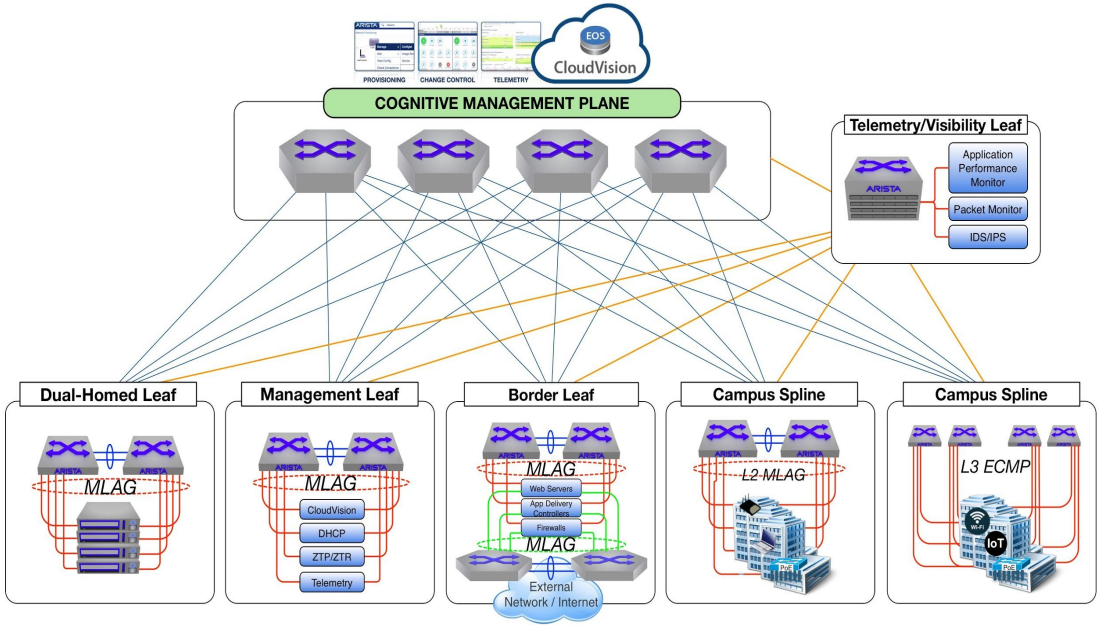


Campus Edge

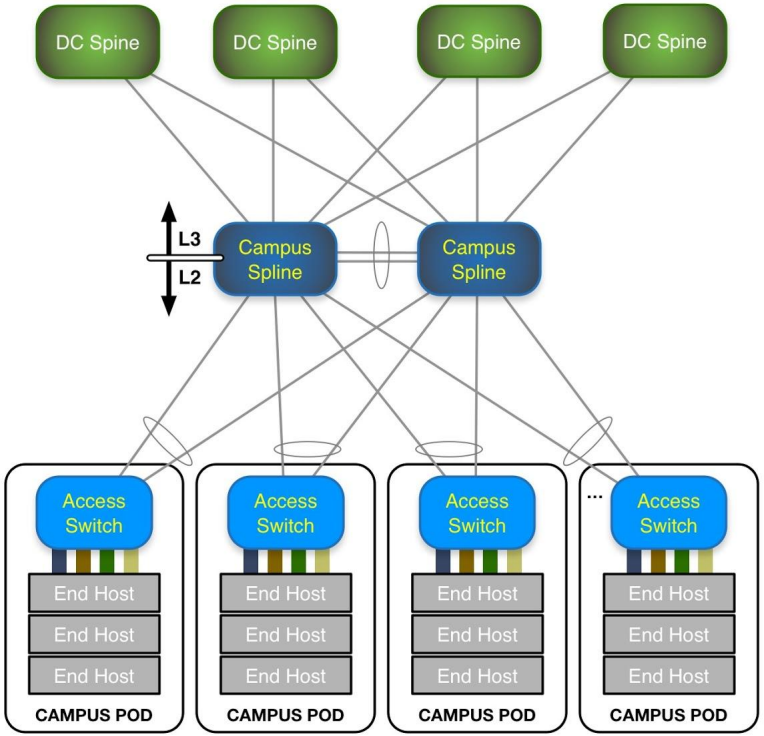
Arista PoE	IOT Visibility Segmentation Control	Wi-FI	MSS & standards-based integration

Arista Universal Cloud Network for Campus

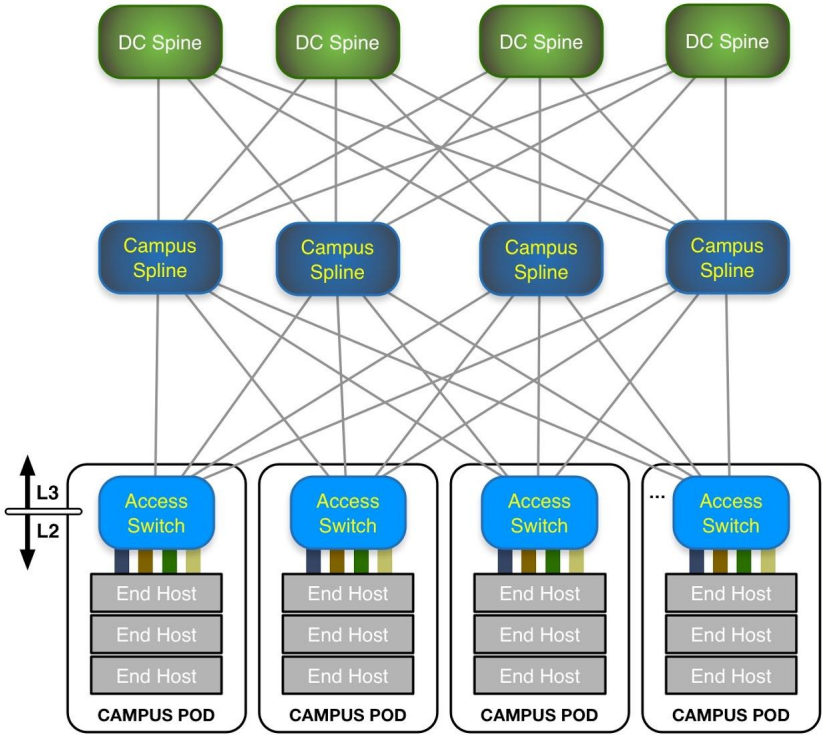
- A single network operating system
- Campus Spline as a Leaf in the data center – consistent design and extension
- Flexible choice of standards-based Layer 2 or Layer 3 connectivity from the Campus POD
- Scale out the Campus POD using standards-based protocols to enable interoperability between different hardware platforms and vendors
- Modern, standards-based segmentation protocols, such as EVPN VXLAN, enabling a scalable Layer 3 design while allowing multi-tenancy and Layer 2 adjacencies if required and constraining fault domains



Arista Campus Architecture



LAYER 2 CONNECTED CAMPUS SPLINE



LAYER 3 CONNECTED CAMPUS SPLINE

Portfolio of Intelligent Campus Systems

Single EOS Image – Comprehensive L2/L3 Solutions – Flexible, Open, Programmable, Resilient

Spine

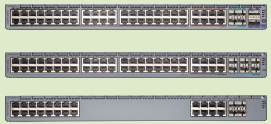
7050X3 Series
10G – 25G

7050X3 Series
100G

7300X3
10G - 100G

1RU | Modular

Leaf



720XP
1G/5G PoE+

7050X
1G to 25G

WiFi

0-105

C-100

C-110

W-118

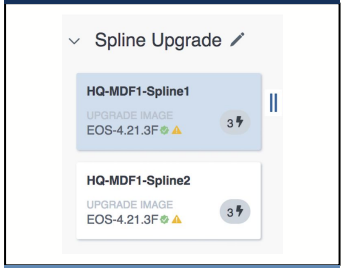
C-130

C-250

C-260

CloudVision's Value in the Campus

Change Management



Reduce Maintenance Window Time

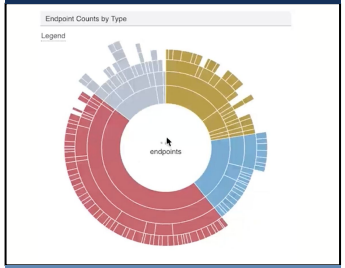
Change Control Workflows

Compliance

Assess Risk

Compliance Dashboard

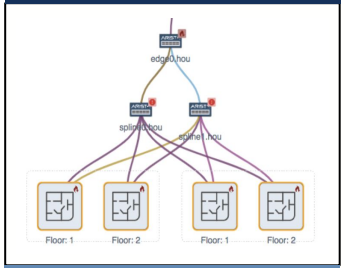
Security



Understand Threat Vectors

Device Analyzer

Visibility



Faster Mean Time To Root Cause

Consistent Dashboards

Wired + Wireless

Break down boundaries

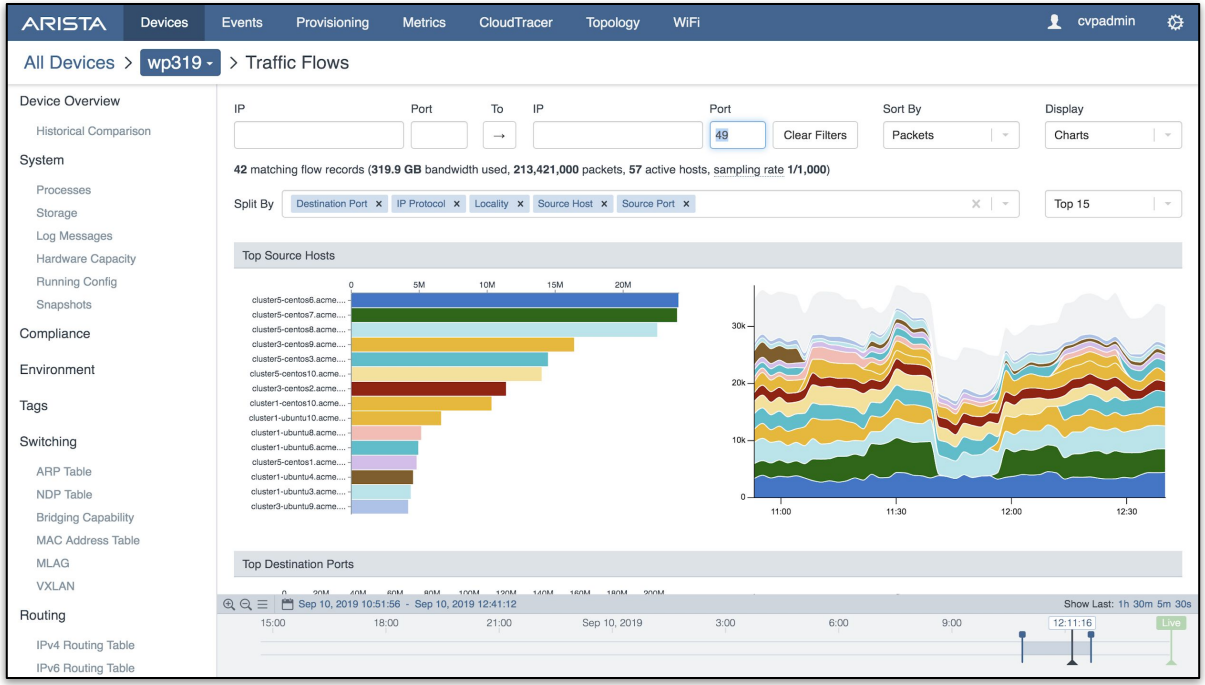
CloudVision WiFi

Break down PIN boundaries with Consistent End-to-End Operations

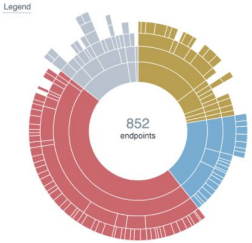
CloudVision: Data Plane Visibility

Data Plane
Understand traffic patterns

Broad Visibility
Correlations from DC to campus to cloud



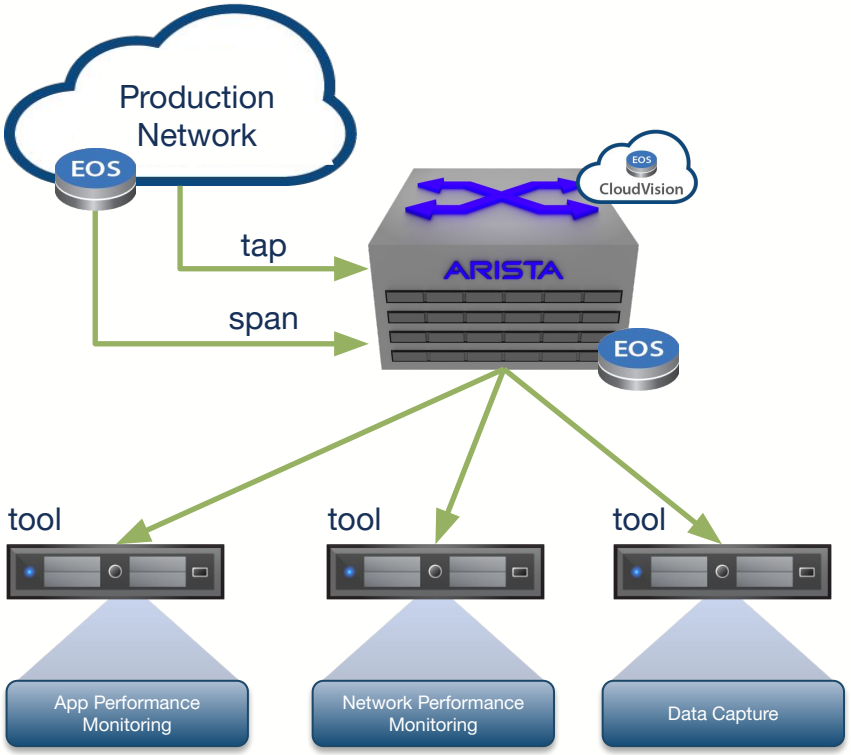
Flow Tracker
Visualization and trend analysis



+ Endpoint Inventory for Security baseline

Improved Capacity Planning and Security Baselining

What is DANZ (**D**ata **AN**aly**Z**er)?



Arista's Port Mirroring and Packet Broker suite of features

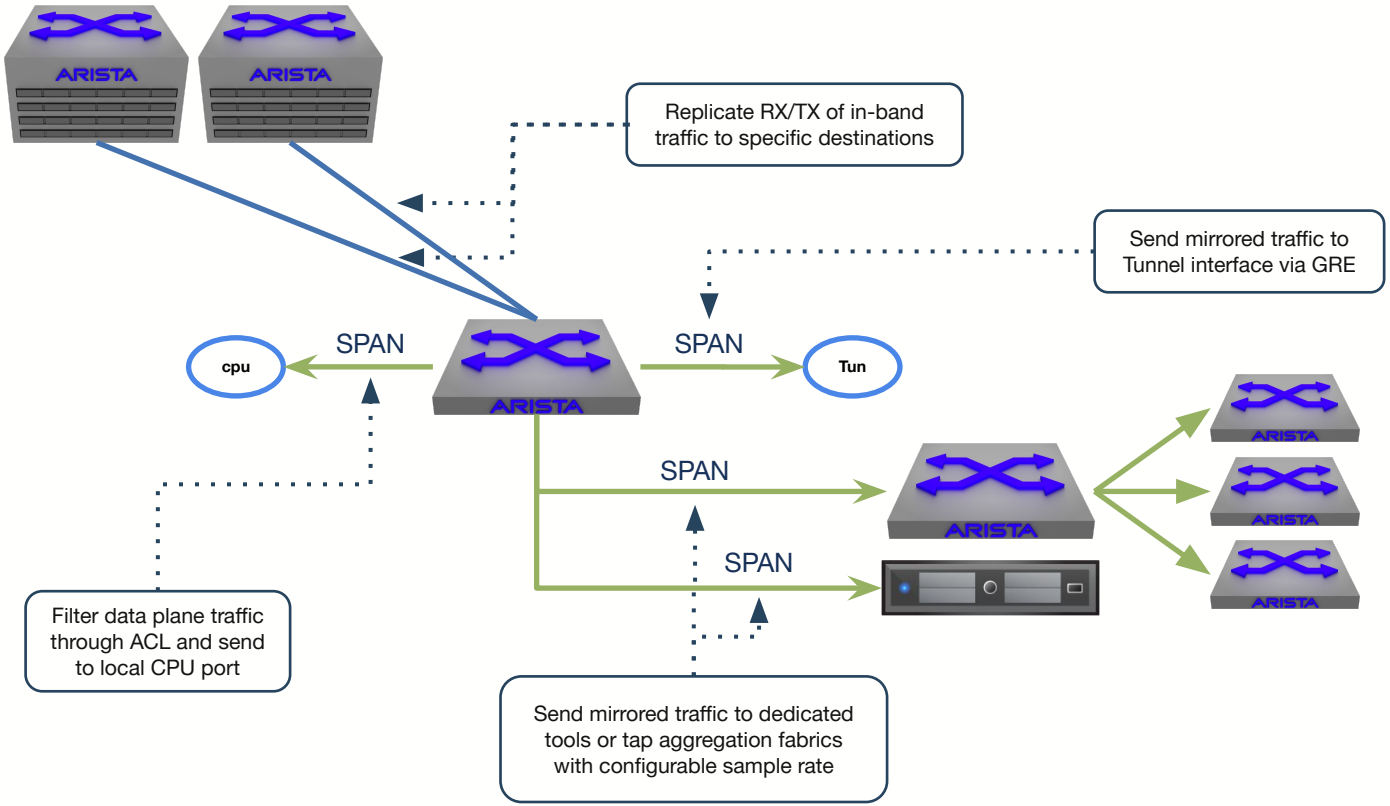
Tap(SPAN) Aggregation: Aggregate out of band monitoring into a single scalable fabric for tool ecosystem

Advanced Port Mirroring: More tools and insight for in-band troubleshooting

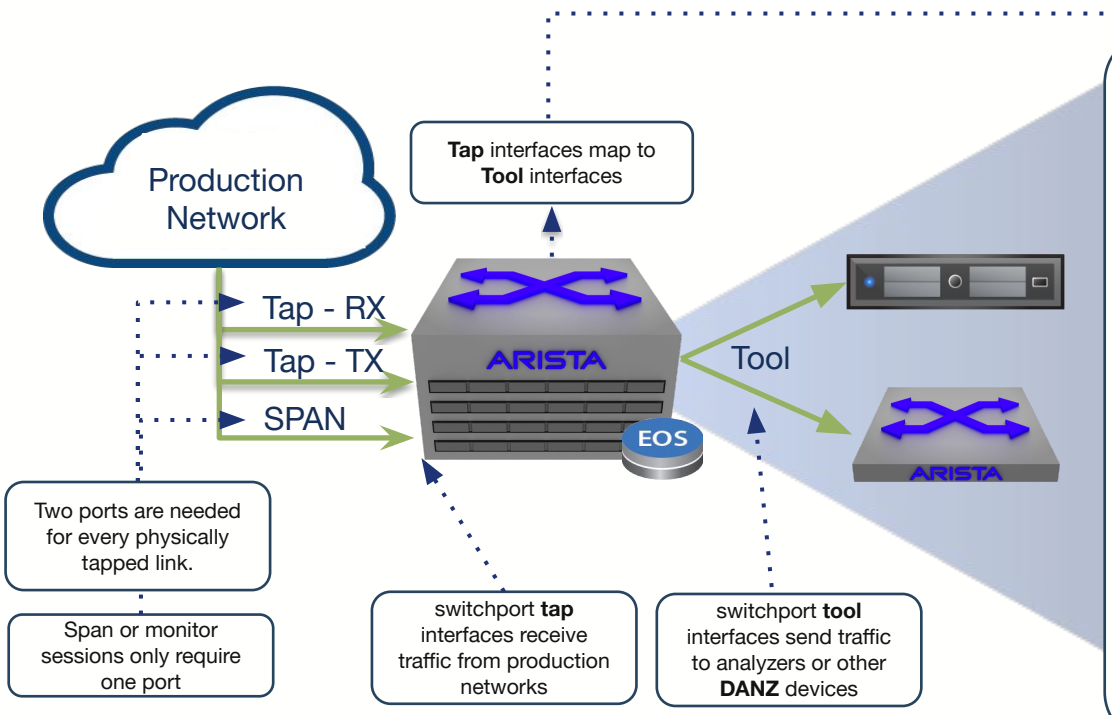
Visibility Focused: Manipulate, steer, slice, sample, tunnel and timestamp flows for more insight into the network

No specialized hardware needed: EOS delivers flexible reprogramming of merchant silicon

DANZ in a Nutshell - Advanced Mirroring



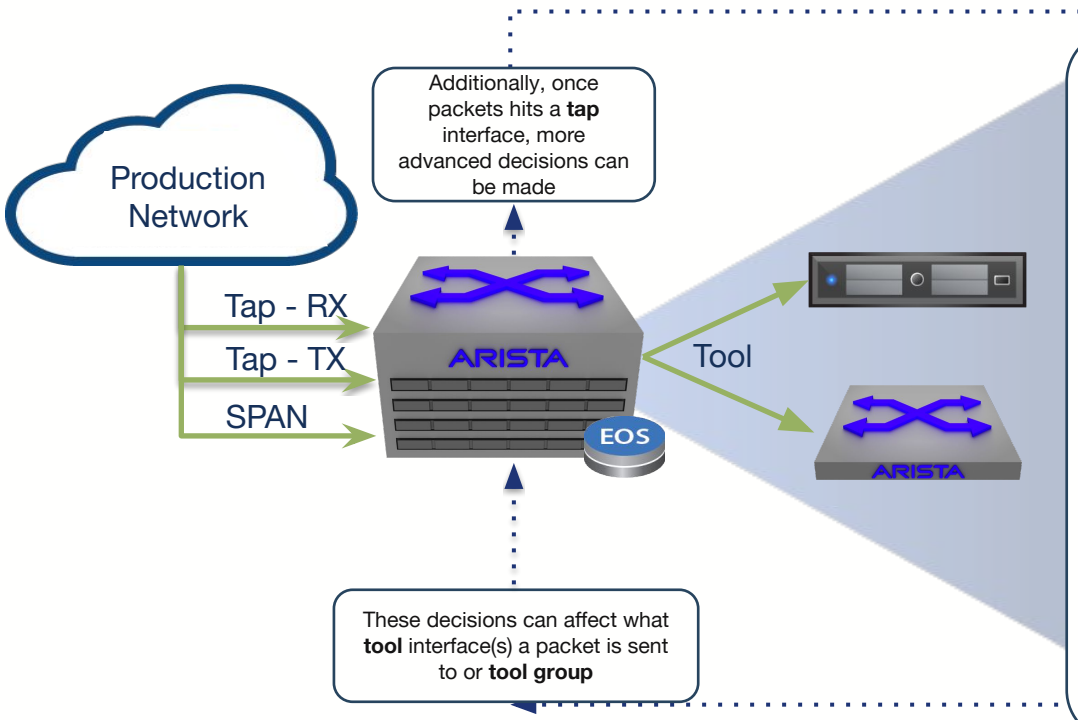
DANZ in a Nutshell - Traffic Aggregation



Tap to Tool Mappings

- Single Tap to Single Tool
- Single Tap to Multiple Tools (**tool groups**)
- Multiple Taps to Multiple Tools (**tool groups**)

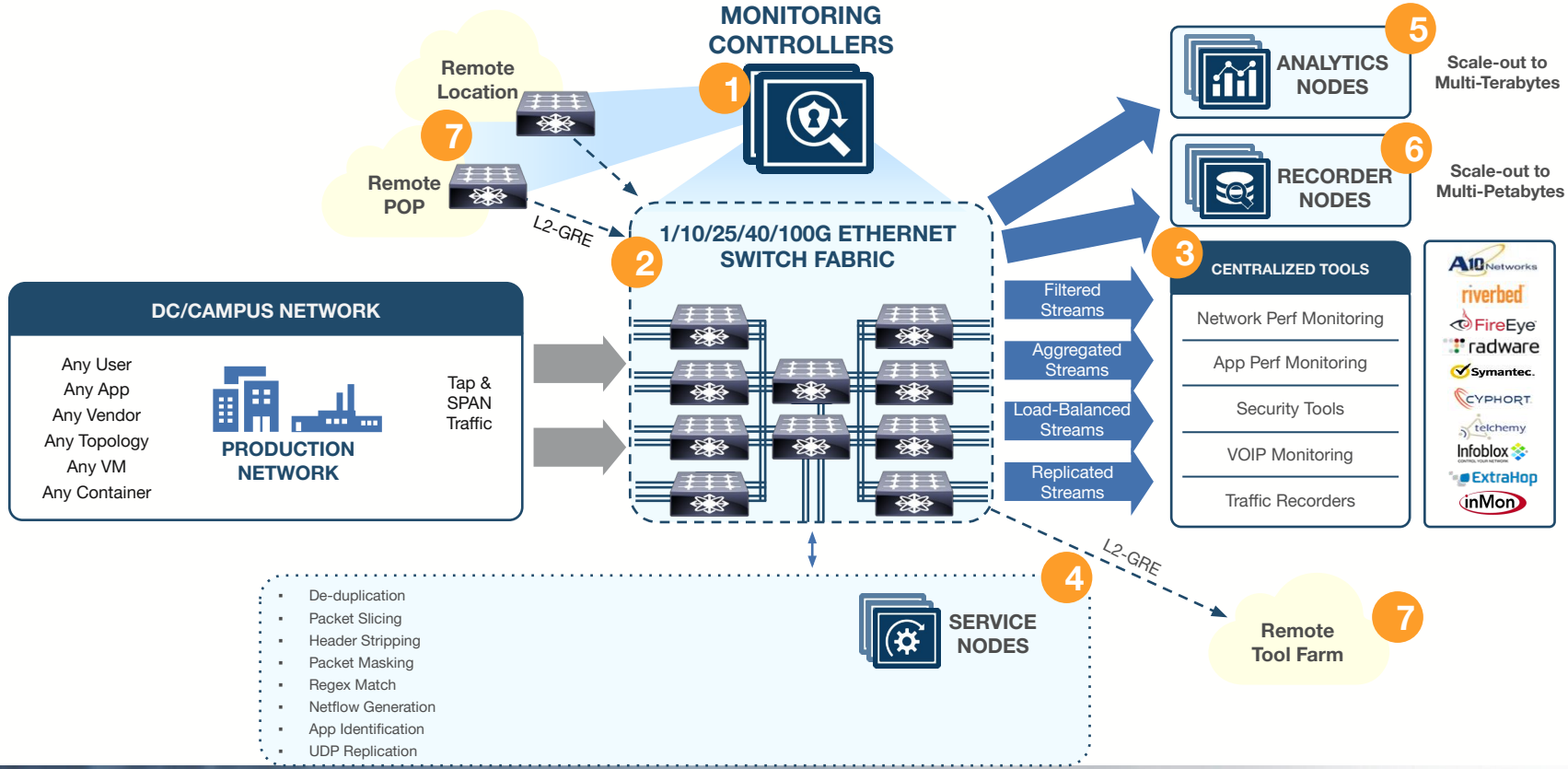
DANZ in a Nutshell - Traffic Manipulation



Possible Decisions

- Drop
- Filter
- Timestamp
- Slice/Truncate
- Inspect
- Tag (dot1q)
- Strip
- Steer

DANZ Monitoring Fabric (DMF) Architecture



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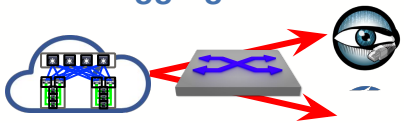
Arista Monitoring/Observability Evolution

TapAgg

DANZ

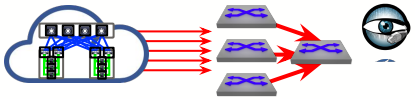
Single-Device Tap/SPAN Aggregation



Arista Platforms

Network Packet Brokers

Multi-Device Tap/SPAN Aggregation

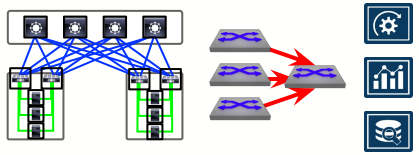


DMF w/ Arista Platforms

DMF w/ OEM Platforms

Network Observability

Integrated Aggregation/ Network Data Time Machine



DMF Smart Nodes w/ Arista:
Analytics, Recorder, Service

DMF w/ Arista Platforms

DMF Smart Nodes w/ OEM:
Analytics, Recorder, Service

DMF w/ OEM Platforms

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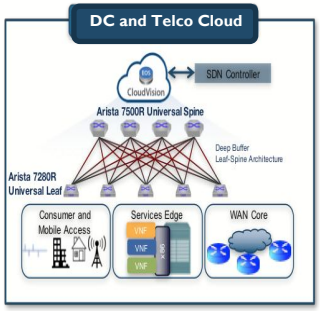
Service Provider Routing

DC and NFV fabrics

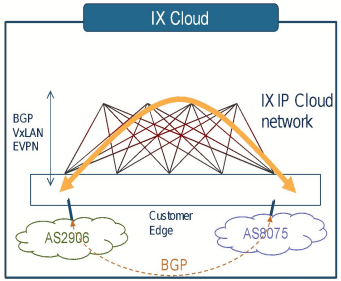
EVPN for Layer2/3 VPNs and
IP-VPN for cloud, NFV and PE



- Scalable leaf-spine fabric
- EVPN-VXLAN
- Layer 2/3 VPNs
- VRF scale for multi-tenancy
- Active-Active forwarding

Internet Exchange

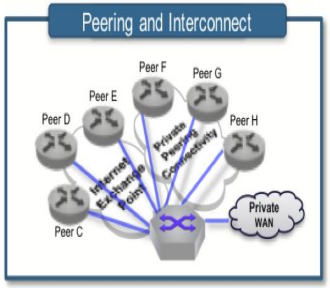
Leaf-spine with VXLAN
for scale-out layer 2 fabrics



- High-density 100G support
- VXLAN-EVPN or HER
- L2 sub-interfaces with VXLAN
- L2 sub-interfaces, shaping/policing

Rich Internet Peering

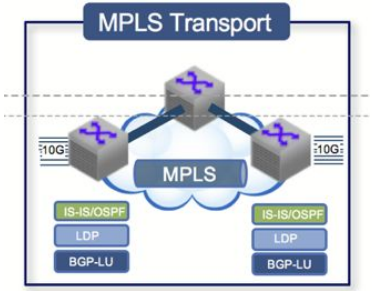
RIB and FIB table for
scale for Internet peering



- FIB and RIB Scale
- FlowSpec
- 6PE, 6VPE, VRF leaking
- GRE for DDOS
- LER functionality

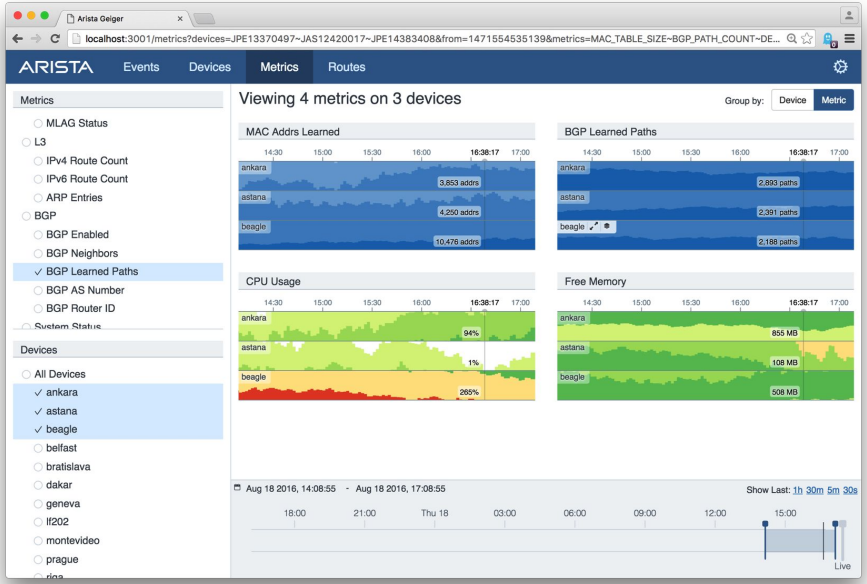
P and PE nodes

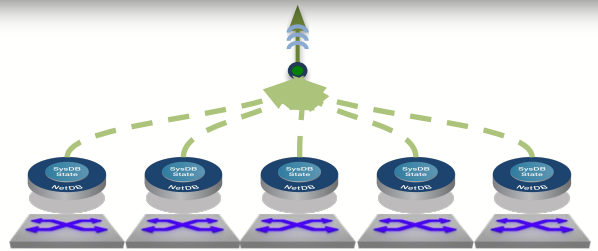
Multi-label MPLS
and Segment Routing



- MPLS-LDP, RSVP-TE
- ISIS-SR, ISIS-TE, BGP-LU
- EVPN-MPLS (layer 2/3 VPNs)
- A-A EVPN for Layer 2 VPNs
- IP-VPN (RFC 4364)

CloudVision Telemetry Apps





Complete, real-time NetDB state streaming

- CloudVision Telemetry Apps provide front-end for visibility network state
- Correlation of network-wide data over a time-series
- Views: Event, Device, Metric, and more
- Timeline view for better historic troubleshooting
- More apps to follow:
  - Other CV-based apps
  - APIs for customer & partner apps

The Value of Telemetry

CLI approach

Interface discards:

```
show interfaces counters
discards
```

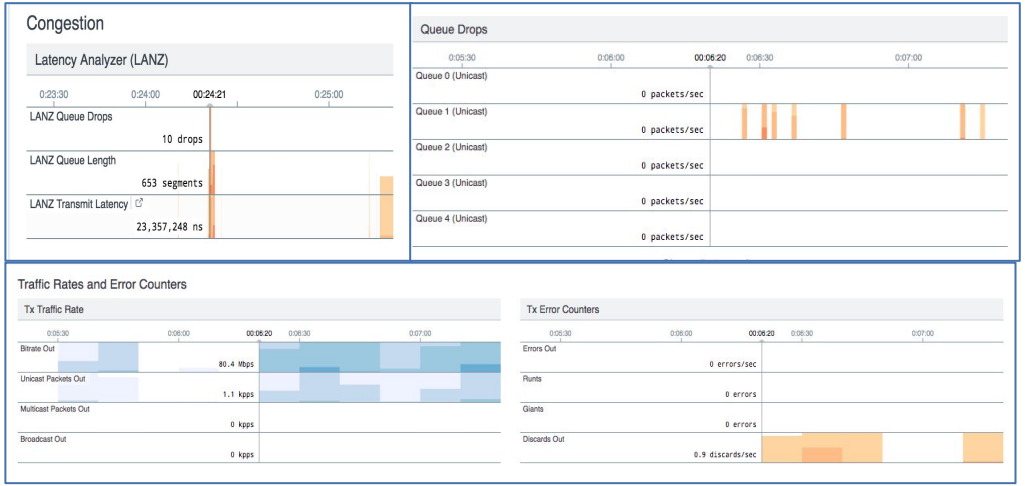
Traffic rate:

```
show interfaces counters rates
```

LANZ data:

```
show queue-monitor length drops
show queue-monitor length
statistics
show queue-monitor length
tx-latency
```

State Streaming approach



BASIC — GRANULAR — REAL-TIME, GRANULAR — REAL-TIME, GRANULAR, AGGREGATED

- Queue drops — EOS
- LANZ for Queue monitoring — EOS
- LANZ Streaming — EOS
- Correlation of discards, LANZ and Traffic rate in a time series

The Value of Telemetry

Historical state - Provides granular visibility for forensic troubleshooting

MONTH

Historical state repository, proactive tracking of state changes

WEEK

AEM to track changes to ARP, MAC, route table entries

DAYS

CLI Scheduler (scheduled tech-supports)

CV Telemetry Routing Table in Device View

Type	Prefix	Nexthops	Metric	Preference
IS-IS level-1	0.0.0.0/0	172.20.254.17 (Vlan1610) 172.20.254.18 (Vlan1610)	10	115
Kernel	0.0.0.0/8	Directly Connected	0	1
Kernel	127.0.0.0/8	Directly Connected	0	1
Kernel	127.0.0.1/32	Directly Connected	0	1
Connected	172.20.0.0/23	Directly Connected (Vlan2000)	1	0
Receive Broadcast	172.20.0.0/32	CPU	1	0
Receive	172.20.0.3/32	CPU	0	0
Receive Broadcast	172.20.1.255/32	CPU	1	0
Connected	172.20.2.0/23	Directly Connected (Vlan2002)	1	0
Receive Broadcast	172.20.2.0/32	CPU	1	0

Routing Table Changes

172.20.254.26/31 modified
Oct 6, 2017 15:14:51

172.20.254.32/29 modified
Oct 6, 2017 15:14:51

172.20.252.3/32 modified
Oct 6, 2017 15:14:51

172.20.252.3/32 modified
Oct 6, 2017 15:14:52

Automated tracking of state changes

172.20.252.3/32 removed
Oct 6, 2017 15:14:59

172.20.252.3/32 modified
Oct 6, 2017 15:20:18

0.0.0.0/0 modified

Oct 6, 2017 15:20:22 Show: Live

Oct 5, 2017 12:00 Oct 6, 2017 Oct 6, 2017 15:20:22 7, 2017 12:00 Oct 8, 2017 12:00

Historic state for Forensic Troubleshooting

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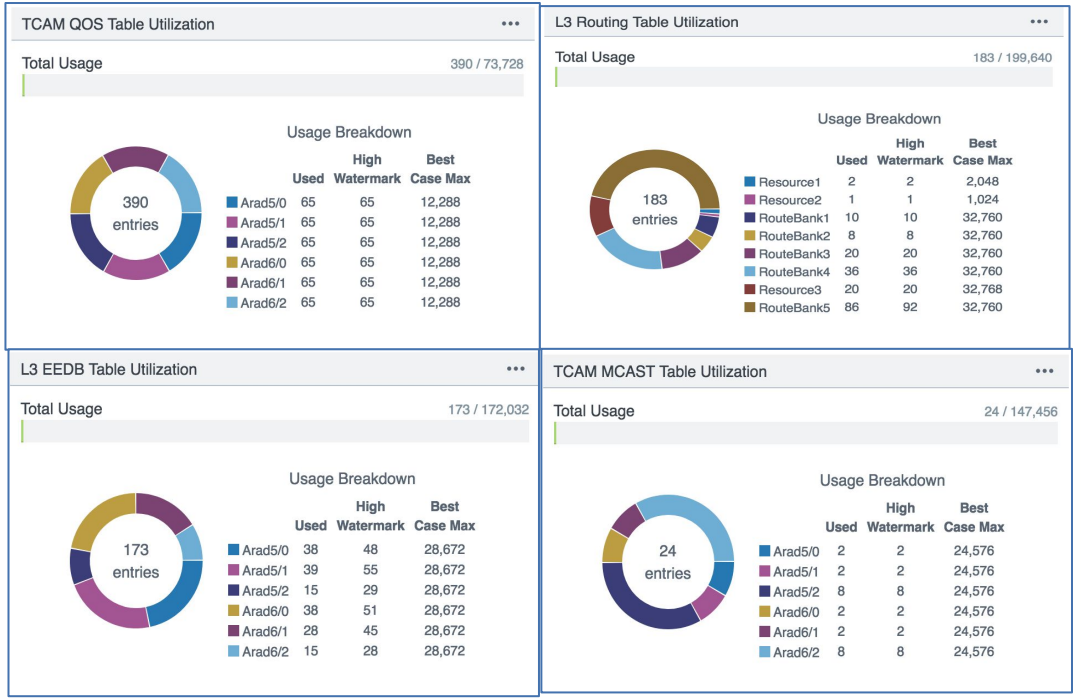
The Value of Telemetry

Abstraction of platform level data

```
show platform fm6000 tcam usage
show platform trident tcam summary
show platform arad tcam summary
```

```
show hardware capacity
utilization percent
exceed [0-100]
```



DIFFERENT ACROSS PLATFORMS → UNIFORM ACROSS PLATFORMS → VISUALIZATION & ANALYTICS ACROSS PLATFORMS

Platform specific commands

CLI level abstraction

Network wide abstraction across all platforms

Ultra-Low Latency, High Precision Application Platform

Ultra-Low Latency and Deterministic

- 5 nanoseconds L1 replication
- Sub 40 ns multiplexing with MetaMux
- Virtually no jitter
- Sub-nanosecond precision

Application Ready

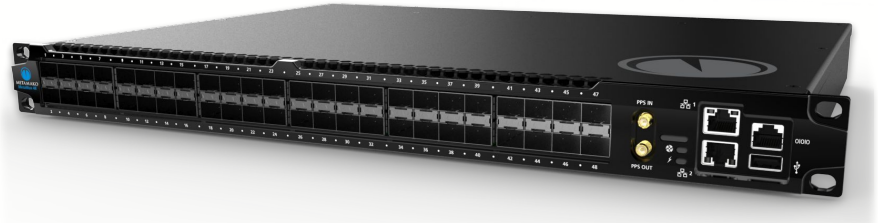
- Leverage Arista applications
  - MetaMux
  - MetaWatch
- Develop your own apps or leverage 3rd party apps

Converged Features

- Media conversion
- Signal regeneration
- Dynamic patching and link management
- Port mirroring

Enhanced Monitoring Capabilities

- Packet statistics on every link
- Signal quality monitoring
- High precision clock
- Precision time stamping *(using MetaWatch)*



Applications

MetaWatch – Advanced network monitoring

- Tapping
- Time synchronisation
- Picosecond-precise timestamping
- Deep buffering (32GB)
- Multi-port capture

Protect™ Firewall – Secure ACL-based filtering

- Filter latency of 112 nanoseconds
- Cut-through filtering with up to 510 rules per ACL
- Comprehensive logging

MetaMux – Low-latency multiplexing

- Data Aggregation in 45 nanoseconds
- Deterministic
- Packet Statistics

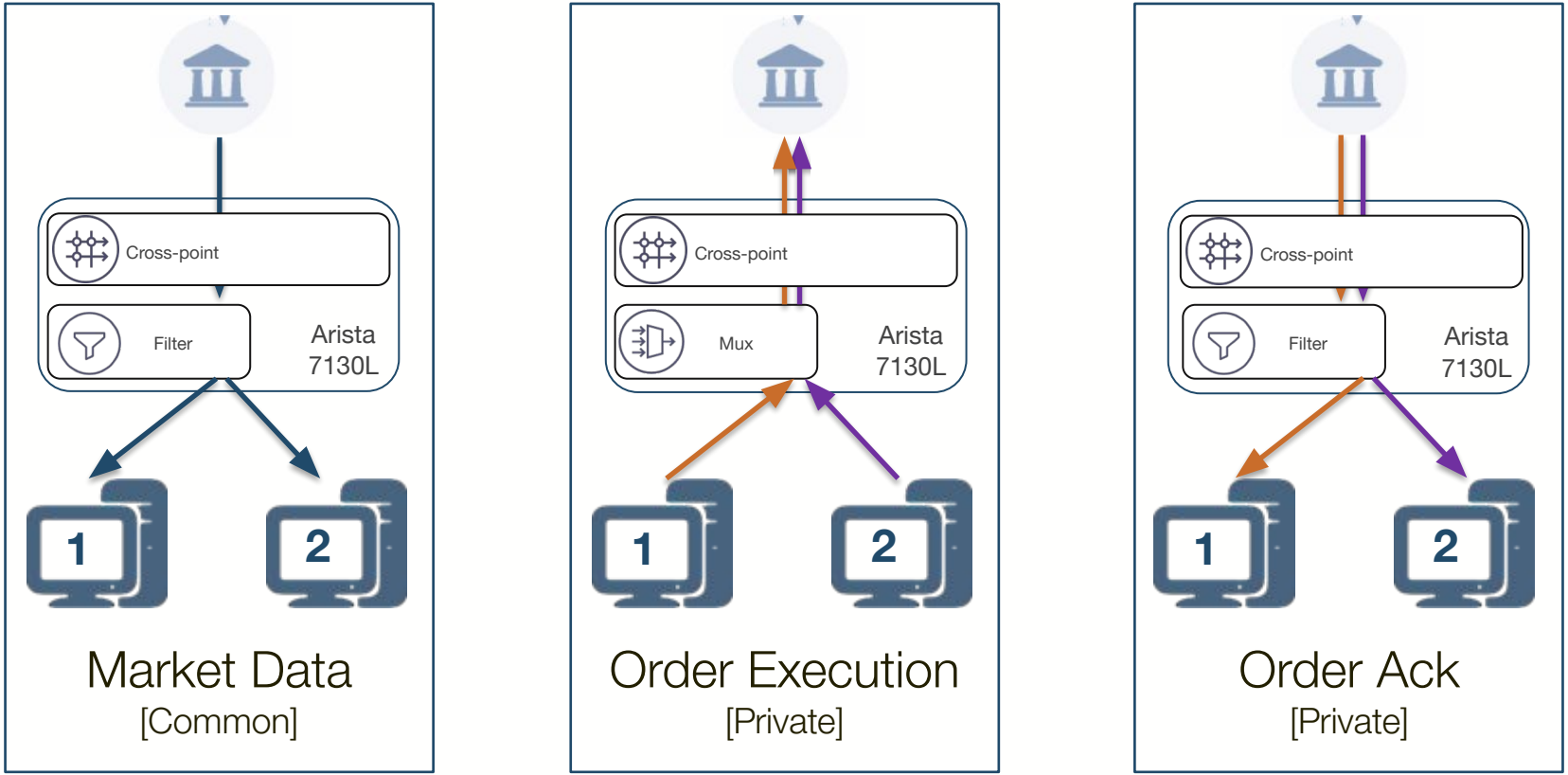
MultiAccess – Shared services

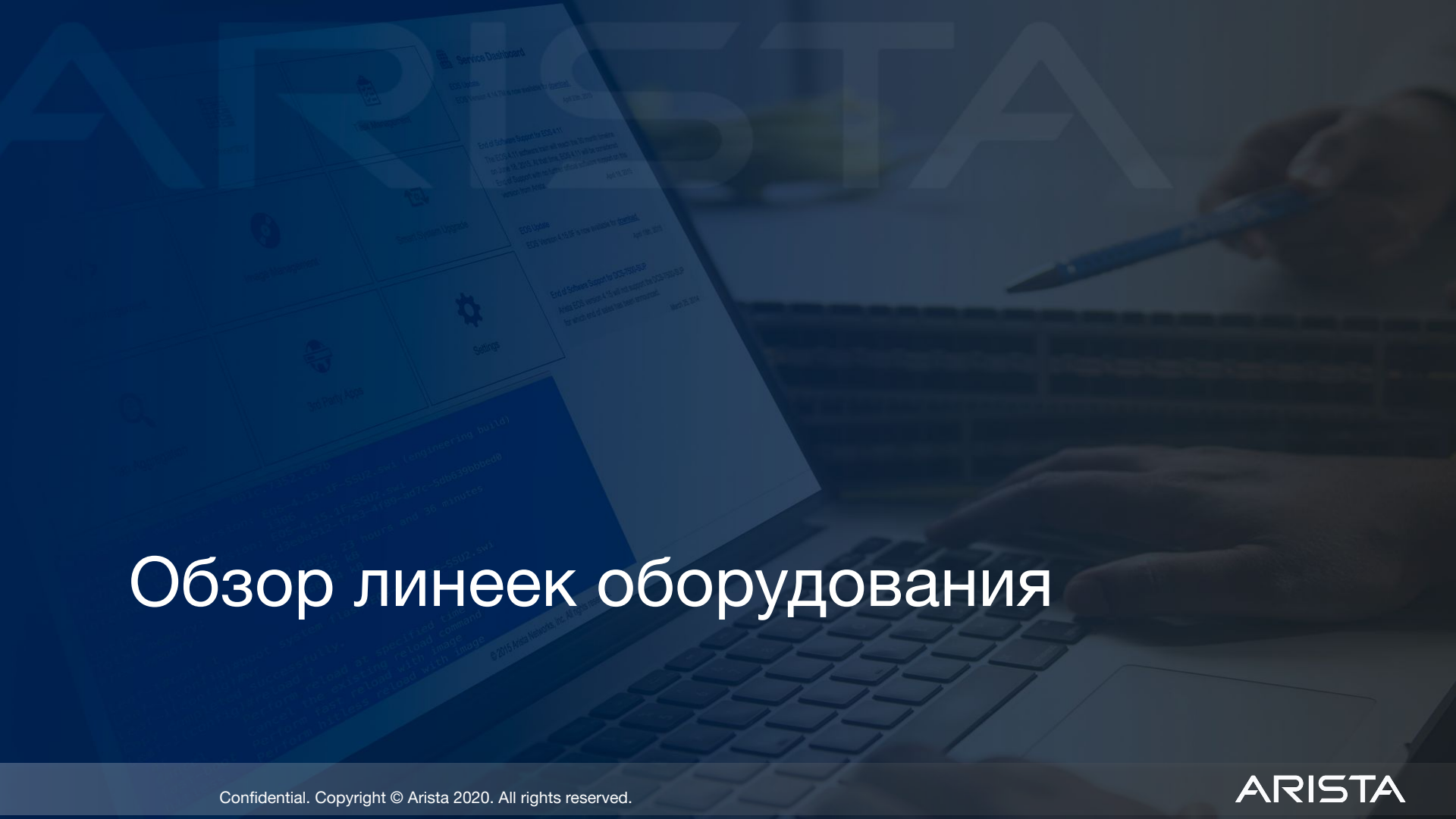
- MetaMux aggregation 95 nanoseconds
- Packet filtering in just 95 nanosecond
- Per port filters for different data subsets
- Deterministic

ExchangeApp – Deterministic Execution

- Timestamp insertion at the edge
- Remove network as a source of latency
- Built-in monitoring and telemetry

MultiAccess – Supporting Multi-tenancy and Isolation





Обзор линеек оборудования

ARISTA

https://www.arista.com/assets/data/pdf/AristaProductQuickReferenceGuide.pdf

General purpose platforms (the most popular)

7010 (Helix4)

- Legacy 1G servers (no VXLAN)
- IPMI / iLO

7020R (Qumran-AX)

- Deep buffers
- Dedicated storage racks
- IPSec on 7020SRG
- TAP aggregation

7050X / 7250X (Trident)

- Flexible chipset (BC Trident)
- Main product for DC
- 1G/10G/25G leaf
- 100G spine

720XP (Trident)

- Campus
- Power over Ethernet

7300X (Trident/Tomahawk)

- Modular Spine / End of Row
- 100G/400G spine

7280R (Jericho)

- Deep buffers
- High scale routing
- Spine
- DCI
- High-end leaf
- Internet peering
- Service Provider routing
- AlgoMatch on (A) models
- TAP aggregation

7500R / 7800R (Jericho)

- Modular
- Deep buffers
- High scale routing
- Spine
- DCI
- Internet peering
- Service Provider routing
- AlgoMatch on (A) models
- TAP aggregation

Purpose-built platforms

7060X / 7260X (Tomahawk)

- High performance (BC Tomahawk)
- 100G/400G spine

7130 (Metamako)

- Ultra Low latency
- L1 switch

7150 (Intel FM6000)

- Low latency
- Timestamping
- NAT
- TAP aggregation

7160 (Cavium XP80)

- Programmable pipeline
- AlgoMatch

7170 (Barefoot Tofino)

- Fully programmable pipeline
- P4 compiler
- AlgoMatch

CloudVision: Multi-Function NetOps Platform

Automated Deployments

Zero Touch Provisioning,
Hierarchical Config, Extensibility

Real-time Telemetry

Granular state streaming for time-series metrics, flows, and events

Change Controls

Orchestrate network-wide upgrades, rollback and snapshots

Cognitive Analytics

Correlations, trend analysis, predictive algorithms across wired and wireless state, network-wide

Compliance / Risk

Continuously assess, report, and remediate deviations, vulnerabilities, bugs

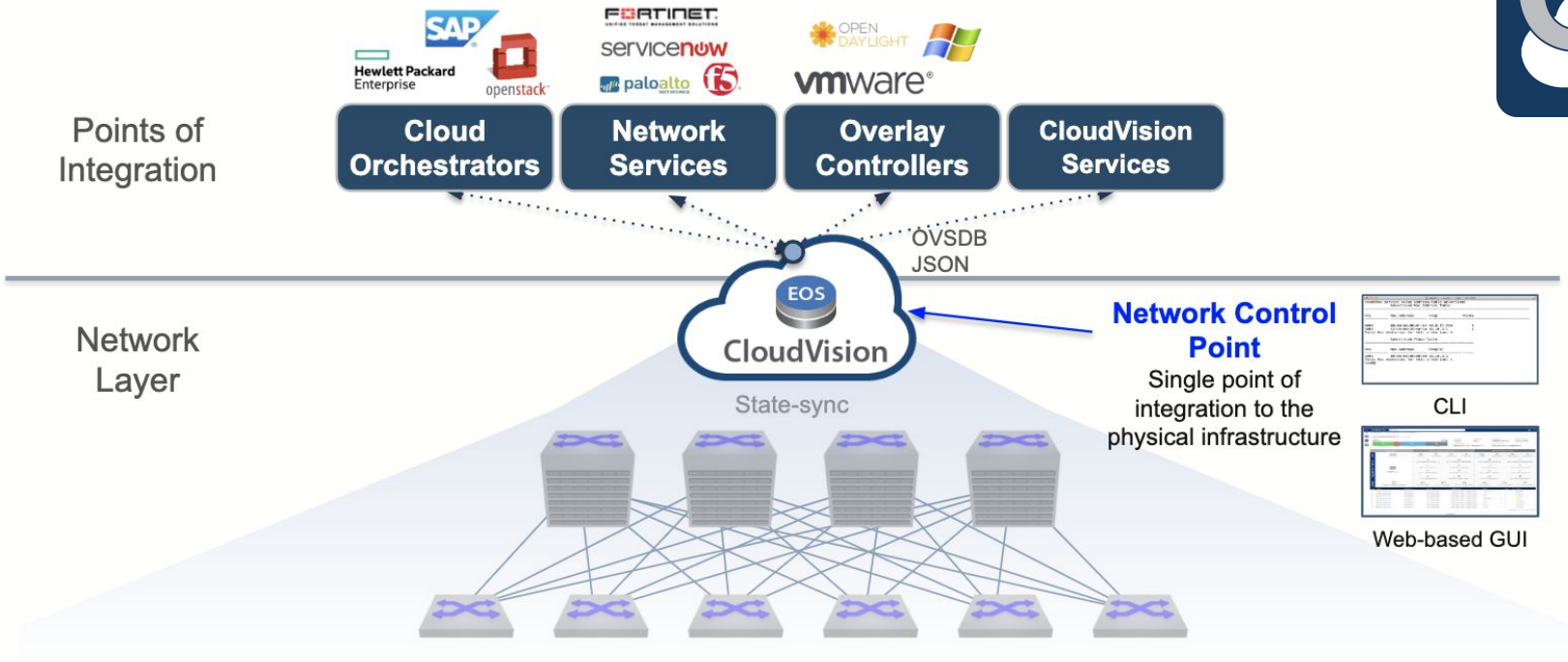
Security Services

Security policy enforcement,
Policy server integration, Wireless IPS

Data Center, Campus Wired/WiFi, Public Cloud, TapAgg

ARISTA

Integration Point to the Underlay

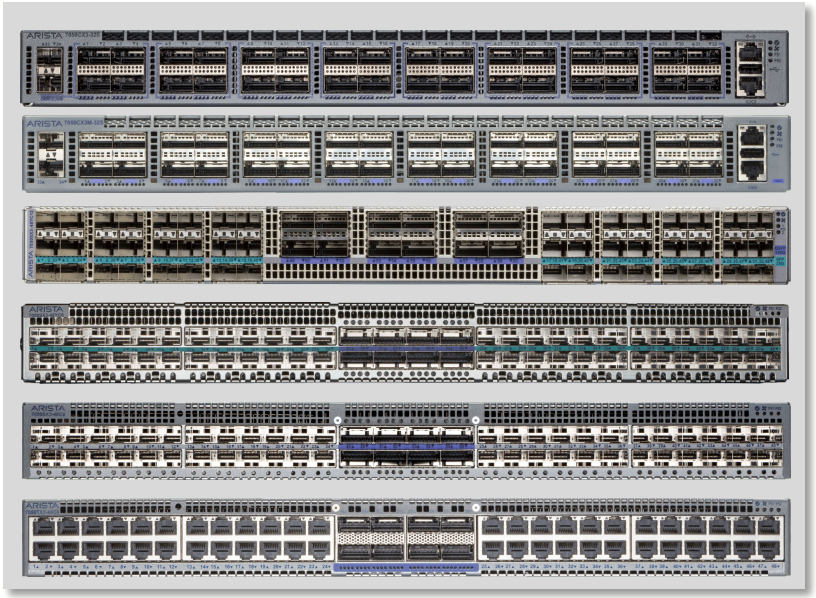


7050X3 Series 25G/100G Systems

DC Leaf / Spine
Campus Spine

Flexible 10G-25G and 40-100G Leaf

- Next Generation high performance systems
  - 3.2T of full duplex 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



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

7050X3 Portfolio

DC Leaf / Spine
Campus Spine

	10G Systems	25G Systems	100G Systems
TD3.X7		 48 x 25G, 12 x 100G QSFP	 32 x 100G QSFP  32 x 100G QSFP MACsec
TD3.X5	 48 x 10G, 8 x 100G QSFP  48 x 10G-T, 8 x 100G QSFP	 48 x 25G, 8 x 100G QSFP	

ARISTA

7260X3 Series 100GbE

100G High Performance Fixed Spine

- Low Latency 100GbE high performance system
  - Latency - 450ns port to port with cut-through mode
  - Shared 42MB buffer and monitoring with LANZ
  - High Performance with 12.8Tbps and up to 4.2Bpps
- Data Center Optimized
  - Data Center Spine and next gen Leaf
  - Under 6W per 100G port typical power
  - Increased L2 and L3 tables
- Comprehensive L2 / L3
  - OSPF, BGP, Multicast & MLAG
  - Support for 256K 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

64 Ports 100GbE – 12.8Tbps

Agile deployment of 10G to 100G

- Flexible 10/25/40/50/100G
- QSFP for broadest connection choices

Consistent certification, knowledge, sparing, and architecture

7060X4 Provides Choice of 400G Systems

- 32 x 400G OSFP
  - 128 x 100G with parallel optics and cables
  - 32 x 100G with OSFP to QSFP Adapter
  - 100% Compatible with QSFP28 optics

- 32 x 400G QSFP-DD
  - 128 x 100G with parallel optics and cables
  - 32 x 100G with QSFP28 optics
  - 100% Compatible with QSFP28 optics

Consistent Architecture with choice 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

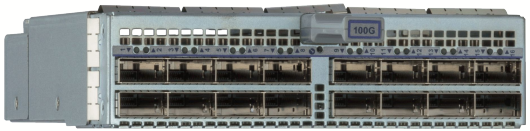
32 Ports 400G – 12.8Tbps

Tomahawk3

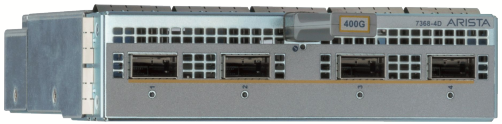
Consistent certification, knowledge, sparing, and architecture

7368X – 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



QSFP – 100G



QSFP-DD – 400G

OSFP – 400G

ARISTA

7300X3 Series Family Overview

High Performance Data Center and Campus Solutions

Cloud Compute – Scale out leaf and spine – Higher density with more features

BigData – High performance – Added scale with flexible L2 and L3

Virtualized Data Centers and Campus – Scalable L2 over L3 – VXLAN and H/W Encapsulation

Features and Benefits:

Wirespeed performance with low latency

L2 and L3 Scalability:

- 288K MAC, 384K IPv4, 128 Way ECMP

Support for Advanced Features:

- VXLAN, PTP, LANZ, SSU

Unique Features for Cloud networks:

- ASU, Resilient Hashing and 128-way multi-pathing

Arista EOS – Modular, Linux tools and Extensions

Arista 7300X3 Series Line cards

Flexible 25G and 100G Spine

7300X3 Series 32 100GbE ports

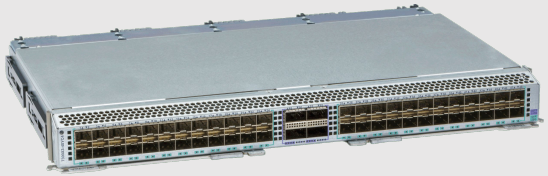
7300X3 Series 48 25GbE and 4 100G ports

- DLB optimized path selection / congestion avoidance
- Comprehensive packet statistics and analytics
- VXLAN routing in hardware
- Consistent 7300X and 7050X Series Features

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

7300X3-32C – 32 x 100G
64MB Buffer



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

Arista 720XP Series – 10M-1G Systems

Gig PoE Campus Access Layer

- High Performance mGig platforms with campus features
  - High Performance with up to 198Gbps throughput
  - Real-time flow telemetry with IPFIX
  - Shared 8MB Smart-buffer and monitoring with LANZ
- Campus Access Optimized
  - Wiring closet access layer switching
  - PoE+ (802.3at) standards-based PoE up to 30W
  - Redundant fans and power supplies
  - Default single PSU, optional additional PSU for redundancy or increased power budget
- Campus networking scalability
  - OSPF, BGP, Multicast, MLAG, VXLAN & EVPN
  - 802.1X Enhancements and MAC Authentication Bypass
  - PoE system controls

48x10M-1G 30W PoE+ Ports
6x25G SFP

24x10M-1G 30W PoE+ Ports
6x25G SFP

Consistent certification, knowledge, sparing, and architecture

Arista 720XP Series – 10M-5G Systems

mGig PoE Campus Access Layer

- High Performance mGig platforms with campus features
  - High Performance with up to 560Gbps throughput
  - Real-time flow telemetry with IPFIX
  - Shared 8MB Smart-buffer and monitoring with LANZ
- Campus Access Optimized
  - Wiring closet access layer switching
  - PoE+ (802.3at) & 4PPoE (802.3bt) standards-based PoE up to 60W
  - Redundant fans and power supplies
  - Default single PSU, optional additional PSU for redundancy or increased power budget
- Campus networking scalability
  - OSPF, BGP, Multicast, MLAG, VXLAN & EVPN
  - 802.1X Enhancements and MAC Authentication Bypass
  - PoE system controls

40x10M-2.5G 30W PoE+ Ports
8x100M-5G 60W 4PPoE Ports
4x25G SFP
2x100G QSFP

16x100M-2.5G PoE 30W PoE+ Ports
8x100M-5G PoE 60W 4PPoE Ports
4x25G SFP

Consistent certification, knowledge, sparing, and architecture

Arista WiFi Family







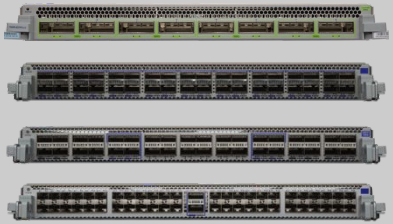

O-105/E	C-100	C-110	C-120	C-130	W-118	C-250	C-260
• 2x2:2 MIMO 802.11ac • Wave 2	• 2x2:2 MU-MIMO 802.11ac • Wave 2	• 2x2:2 MU-MIMO 802.11ac • Wave 2 • Tri-Radio	• 4x4:4 MU-MIMO 802.11ac • Wave 2	• 4x4:4 MU-MIMO 802.11ac • Wave 2 • Tri-Radio	• 2x2:2 MU-MIMO • Wave 2 • Tri-Radio Wallplate	• 8x8:8 • 4x4:4 • MU-MIMO • Tri-Radio • BLE	• 8x8:8 5GHz • 4x4:4 2.4GHz • MU-MIMO • Tri-Radio • BLE
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	2x 2.2 Gigabit Ethernet	2x 5 Gigabit Ethernet
• 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	• Highest performance • Highest density • Persistent scanning with 3rd radio	• Highest performance • Highest density • Persistent scanning with 3rd radio

7500R and 7280R Deep Buffer Systems

Common single EOS image, Deep Buffer, Lossless Architecture, Large Tables

Choice of form factors, density and port speeds for varying use cases

Standards based switching for reliable deployments



10G, 25G, 40G and 100G Linecards

7500R/R2 Series

48 10G-T and 6 100G

48 10G-SFP and 6 100G

48 25G SFP and 6 100G

24 10G SFP + 24 25g and 6 100G

40 10G SFP and 2 200G CFP2-DCO

24 40G and 12 100G QSFP

56 40G and 16 100G QSFP

7280R/R2 Series

30 100G QSFP

48 100G and 8 40G QSFP

60 100G QSFP

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7500R/R2 Series Line Cards

Industry leading performance and density

8 200G CFP2-ACO DWDM ports
MacSec, Coherent QPSK, 8/16QAM

36 40G-QSFP ports - no
40G & price optimized

36 100G-QSFP ports
Options: MacSec, 2M Routes

48 SFP, 2 QSFP ports
Options: 10G, 25G, 2M Routes

- 10/25/40/50/100G Ethernet Support
- 650MB+ of buffer per 100G port
- Wirespeed Layer2 & Layer3
- Low latency 3.5µsec port to port
- 1.0, 1.3 and 2.4 Million Routes
- VXLAN Routing
- EVPN, MPLS, Segment Routing
- Integrated MACsec at 100GbE

Next Generation R-Series Portfolio

7280R3

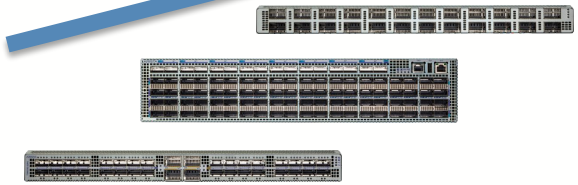
7500R3

7800R3

115Tbps – 460Tbps

76Tbps – 230Tbps

4Tbps – 19Tbps

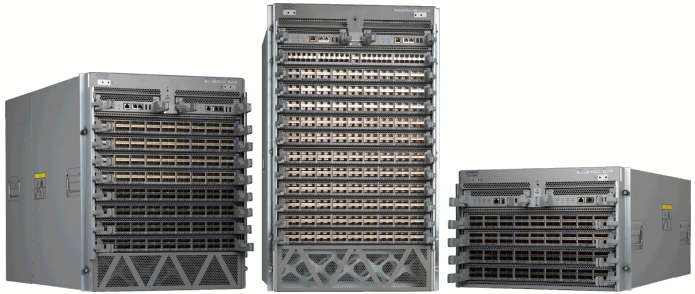


ARISTA

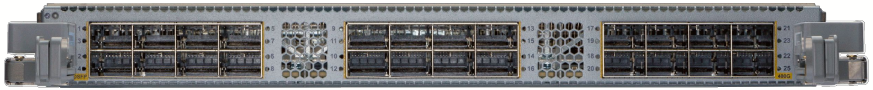
7500R3 High Density 400G and 100G Systems

High Performance 100G / 400G Spine:

- 230Tbps of throughput with choice of Chassis
- Consistent VOQ / Deep Buffers
- Backward compatible with 7500R and 7500R2



Chassis	400G OSFP	4 x 100G	100G QSFP
DCS-7512	288	1152	432
DCS-7508	192	768	288
DCS-7504	96	384	144



400G Linecard:

- 24 x 400G OSFP linecards
- Supports range of optics and cables to ZR and ZR+
- Breakout to 4x100G and 2x200G

100G Linecard:

- 36 ports of 100G with QSFP
- Supports copper cables, AOC, data center to DWDM optics
- 2.5M Route Scale Option

7280R3 Series Fixed 100G/400G Switches

Wire Speed 100/400G with Deep Buffers

High Performance:

- Up to 24 x 400G wire speed ports
- Non-blocking up to 9.6 Tbps and 4 Bpps
- FlexRoute™ - 1.3M / 2.5 Million+ IPv4 & IPv6 Routes

R-Series Architecture:

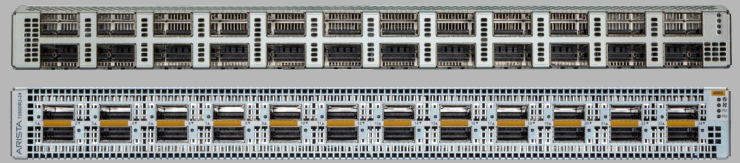
- VOQ architecture and deep buffers for lossless forwarding
- EOS for convergence and scale

Advanced Features:

- VXLAN Routing, Advanced Load Balancing
- Algorithmic ACLs, Network Telemetry and Accelerated sFlow
- EVPN, MPLS, Segment Routing

Cloud and Carrier Grade Networking:

- Dense 100G and 400G for SP, Cloud, Internet, HPC & CDN
- DC Optimized airflow and AC / DC power



7280PR3-24, and 7280DR3-24 (plus K Versions)

7280CR3-96 (plus K Version)

7280CR3-32P4, 7280CR3-32D4 (plus K Versions)

7800R3 Series Next Generation 100G/400G

Cloud and Carrier Grade Networking

High Performance for next 10 years:

- Up to 576 x 400G wire speed ports
- Non-blocking up to 460 Tbps and 96Bpps
- 14.4 Tbps / slot with 36 x 400G linecards
- Upgradable to 800G (28.8Tbps /slot) for higher density

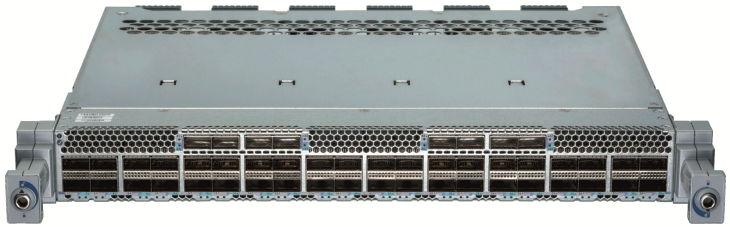
R-Series Architecture:

- VOQ architecture and deep buffers for lossless forwarding
- FlexRoute™ - 1.3M / 2.5 Million+ IPv4 & IPv6 Routes
- EOS for convergence and scale

Advanced Features:

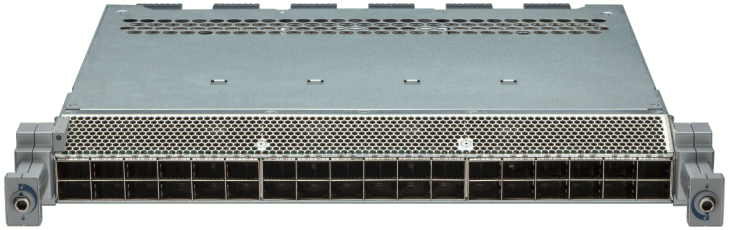
- VXLAN Routing, Advanced Load Balancing
- Algorithmic ACLs, INT and Accelerated sFlow
- EVPN, MPLS, Segment Routing
- Dense 100G and 400G for SP, Cloud, Internet, HPC & CDN

Highest Capacity 400G and 100G System



100G Linecard:

- 48 ports of 100G with QSFP
- Supports copper cables, data center to DWDM optics
- 2.5 Million Routes with features



400G Linecard:

- 36 ports of 400G OSFP – 14.4Tbps
- 6 Billion Packets per second of L2 and L3
- Range of optics and cables - ZR and ZR+
- Flexible 4x100G and 2 x 200G Modes

High Performance System:

- Choice of Chassis (4/8/16 slot)
- Future higher density and 800G

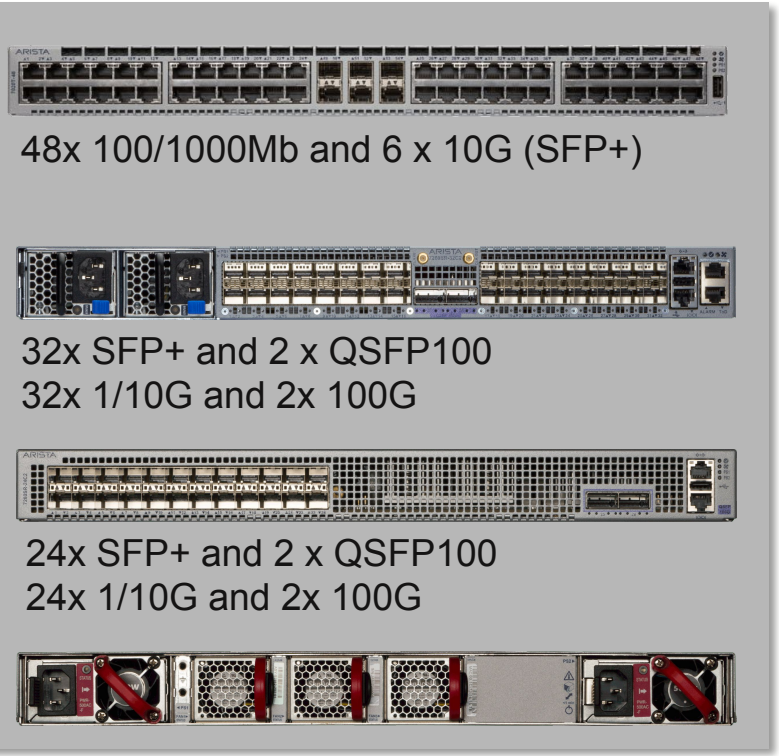
Chassis	Throughput	400G OSFP	4 x 100G	100G QSFP
DCS-7816	460Tbps	576	2304	768
DCS-7808	230Tbps	288	1152	384
DCS-7804	115Tbps	144	576	192

7020R Series – 1RU – Fixed Systems

DC Leaf / TapAgg
Simple MPLS

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 and SyncE Support
- Front (Ports) to Back airflow and reverse
- Redundant power - Choice of AC or DC
- Hotswap Fans
- Compact Chassis form factors



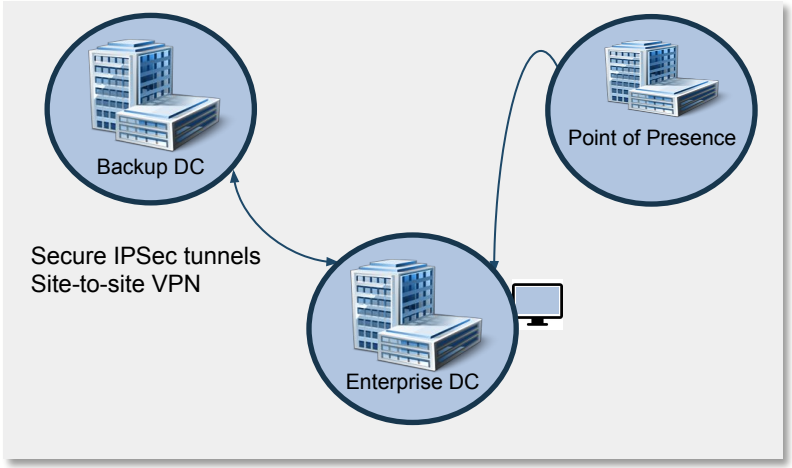
Consistent High Performance and Extensible EOS

ARISTA

7020SRG-24C2 10G 1U – IPSec

- 24 x 10G, 2 x 100G Interfaces
  - 1/10G on SFP+ and 10G to 100G on QSFP100
- IPSec Support
  - Aggregate 20 Gbps (half-duplex)
  - 96 tunnels
  - AES128/256, SHA1/2, tunnel mode
- High Performance and Scalable
  - Qumran-AX Based w/ IPSec capability
  - Deep Buffers – 3GB
  - Throughput - 300Mpps, 440G
  - FlexRoute (200K) IPv4 Routes

Software Release 4.22.0F



7010T – High Performance Power Efficient

- Key Features:
  - 48 10/100/1000BASE-T ports
  - 4 1/10G SFP+ uplinks
  - Comprehensive IPv4 and IPv6 features
  - Optimal Resource Utilization for L2 and L3 Scale
  - Non-blocking L2/3 performance
  - Reversible front-to-rear airflow
  - Redundant power with choice of AC and DC

- Use Cases:
  - Optimize 1G servers connecting to 10G networks
  - Management networks and IPMI / iLO ports

Arista 7130 **Connect** Series

- A fully featured **layer 1+** switch
- 16, 48, or 96 port devices
  - Unrestricted 1:1 or 1:N
  - Port replication/mirroring/tapping
  - Bit for bit forwarding
  - Non-blocking
  - 1RU or 2RU
  - Dual power supply/fans
    - Configurable air flow
    - AC or DC

DCS-7130-16#: Arista 7130 Series Connect 16 Layer-1 Switch
DCS-7130-48#: Arista 7130 Series Connect 48 Layer-1 Switch
DCS-7130-96#: Arista 7130 Series Connect 96 Layer-1 Switch

Arista 7130 models with FPGA

NEW L-Series

- 1x Xilinx Virtex® UltraScale+™ VU7P “L”
- 1x Xilinx Virtex® UltraScale+™ VU9P “LB”
- 32, 64 & 96 port models
- Optimized for MetaWatch or MetaMux

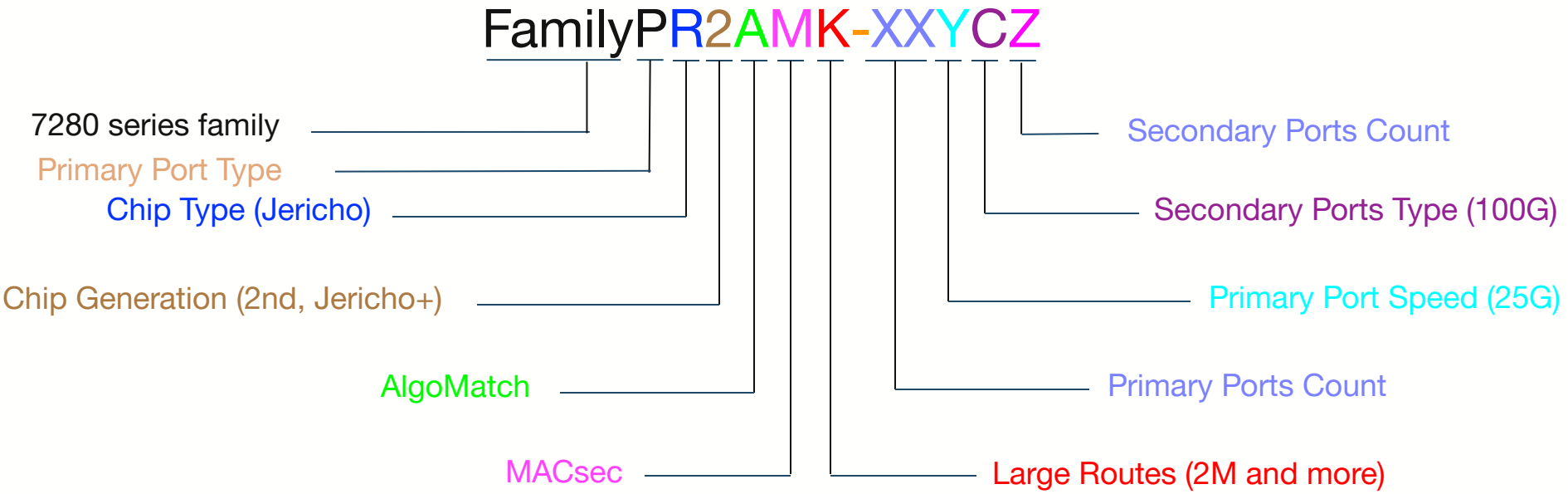
E-Series

- 1x or 3x Xilinx Kintex® UltraScale™ KU095
- 1x or 3x Xilinx Virtex® UltraScale+™ VU9P
- 32, 64 & 96 port models
- Optimized for MetaMux and MultiAccess

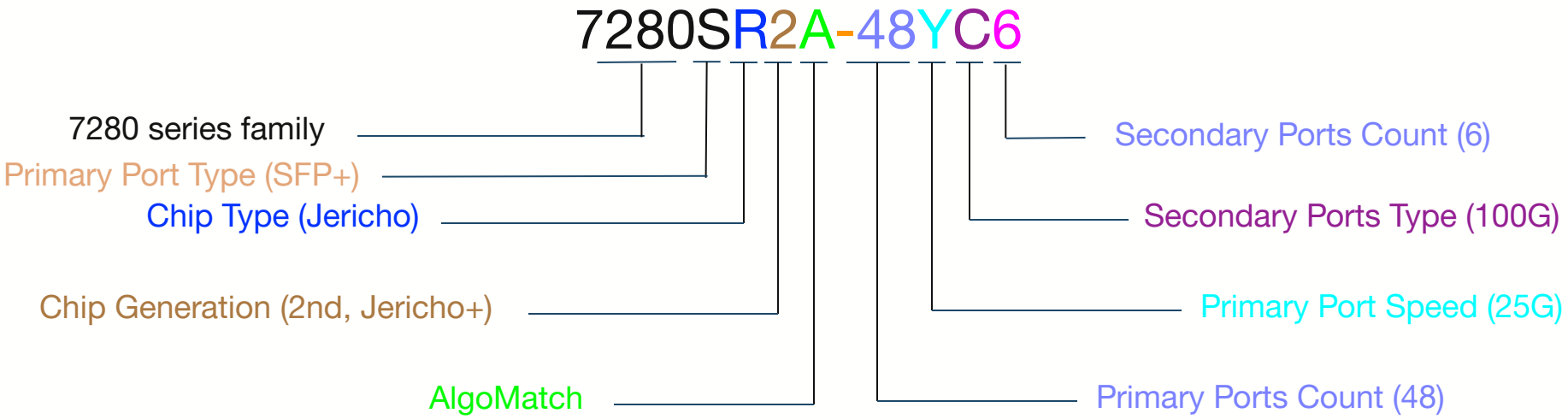
Application Support

	Layer 1+	MetaMux	MetaWatch	MultiAccess	Exchange	Protect	FPGA Dev
7130L	✓	43ns	✓	✓	✓		1 x Ultrascale + VU7P-2
7130LB	✓	39ns		✓			1 x Ultrascale + VU9P-3
7130P	✓					✓	1 x Intel Arria 10
7130EH	✓	45ns		✓			1 x Ultrascale + VU9P-3
7130	✓						

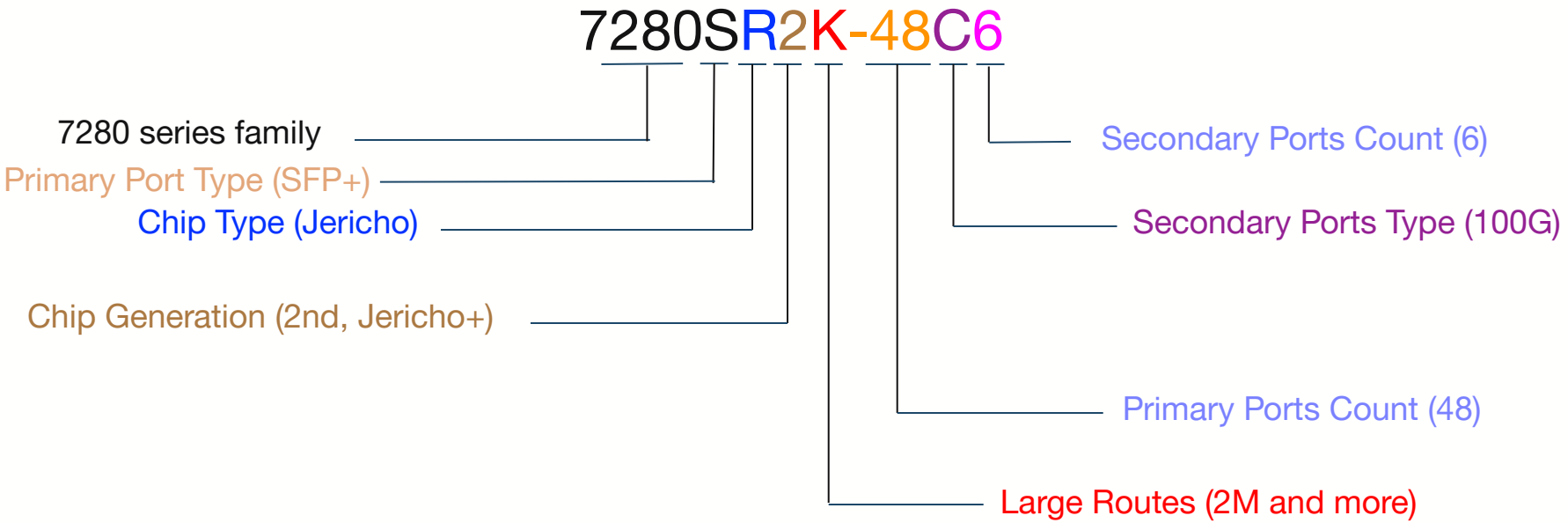
SKU Decoder Ring



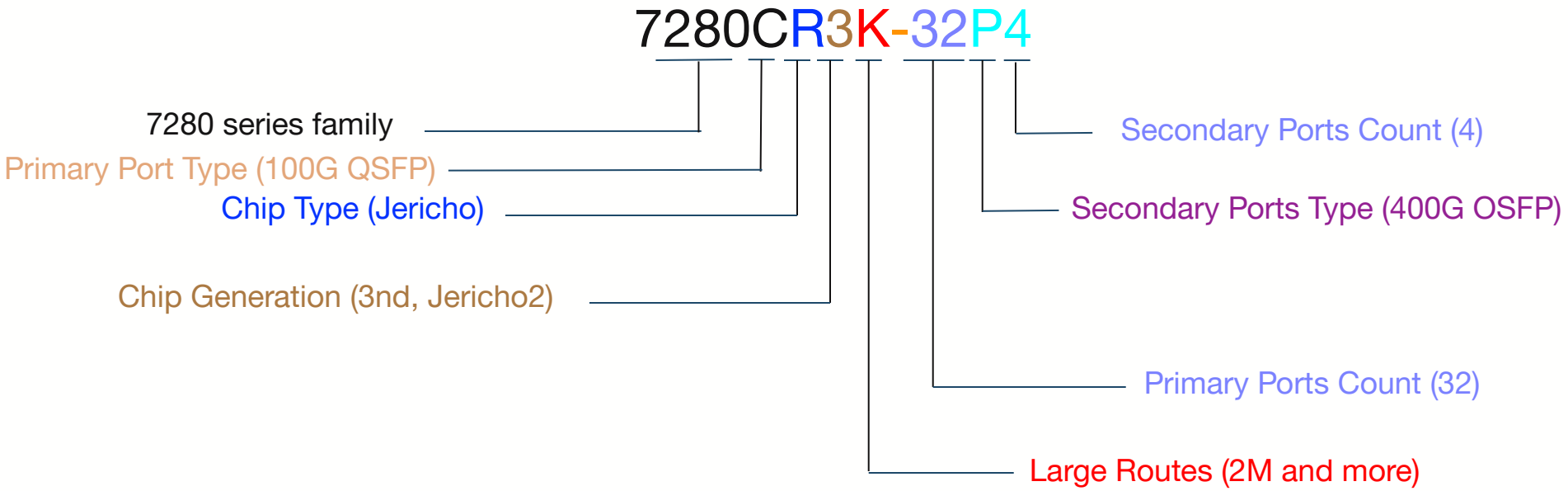
7280R Switch SKU Decoder Ring

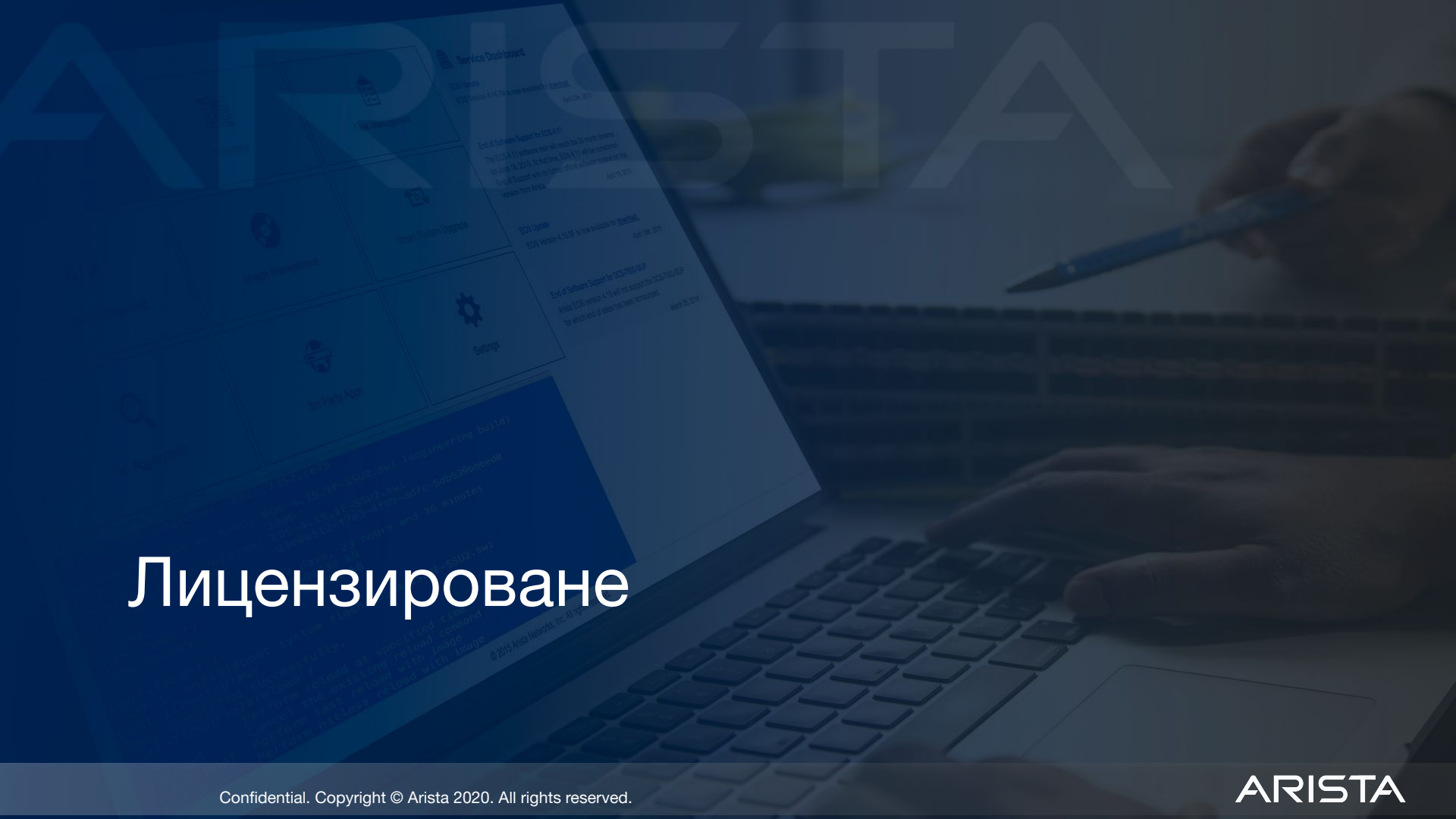


7280R Switch SKU Decoder Ring



7280R Switch SKU Decoder Ring





Лицензиране

ARISTA

Функциональное лицензирование коммутаторов

Коммутаторы имеют следующие типы функциональных лицензий (лицензии perpetual):

- Базовая (нет лицензии)
  - L2 коммутация, статическая маршрутизация
- -E
  - Все динамические протоколы маршрутизации (кроме BGP-EVPN)
  - Статический VXLAN (без EVPN)
  - **Как правило эта лицензия используется на уровне Spine в ЦОД**
- -FLX-L
  - Функциональность лицензии -E
  - Поддержка BGP-EVPN
  - Базовая поддержка MPLS (без L3VPN и Traffic Engineering)
  - **Как правило эта лицензия используется на уровне Leaf в ЦОД**
- -FLX (**применимо только для 7280R, 7500R, 7800R**)
  - Функциональность лицензии -FLX-L
  - Полная поддержка MPLS
  - Масштабирование таблиц маршрутизации до уровня Интернет
- -Z
  - Использование API на коммутаторах
  - TAP агрегация
  - Если заказчик использует CloudVision, то эта лицензия не нужна (она включена в лицензию на CloudVision)

Лицензирование в зависимости от типа коммутатора

Тип лицензии зависит не только от функциональности, но и в зависимости от категории коммутатора (его производительности):

- **LIC-MOD-1-** для модульных 4-слотовых шасси
- **LIC-MOD-2-** для модульных 8-слотовых шасси
- **LIC-MOD-3-** для модульных 12-слотовых шасси
- **LIC-MOD-4-** для модульных 16-слотовых шасси
- **LIC-FIX-1-** для фиксированных коммутаторов из категории 1
- **LIC-FIX-2-** для фиксированных коммутаторов из категории 2
- **LIC-FIX-3-** для фиксированных коммутаторов из категории 3
- **LIC-FIX-4-** для фиксированных коммутаторов из категории 4
- **LIC-FIX-MG-** для фиксированных 1G и mG (2.5G / 5G) коммутаторов

Как узнать к какой категории принадлежит коммутатор?

- Это написано в datasheet
- Это приведено в этом документе:
  - https://www.arista.com/assets/data/pdf/Software-Licensing-Framework.pdf

Лицензирование CloudVision

- CloudVision продается исключительно в виде лицензий, ограниченных по времени (подписка)
- Покупается лицензия на каждое устройство
- Гранулярность лицензирования: 1 устройство + 1 месяц (минимальный заказ 12 месяцев на одно устройство)
- Чаще всего используются следующие лицензии:
  - **SS-CV-SWITCH-1M** - 1 месяц на один коммутатор с портами 10G и более
  - **SS-CV-G-SWITCH-1M** - 1 месяц на один коммутатор с портами менее 10G
- “Упрощенные” варианты CloudVision:
  - Для использования в лаборатории:
    - **SS-CV-SWITCH-LAB-1M**
  - Без телеметрии, без аналитики, без TapAgg:
    - **SS-CV-LT-SWITCH-1M**
    - **SS-CV-LT-G-SWITCH-1M**
- https://www.arista.com/en/support/product-documentation/eos-feature-licensing#datatab3316
- Требования к серверам для установки CloudVision:
  - https://www.arista.com/en/cg-cv/cv-system-requirements

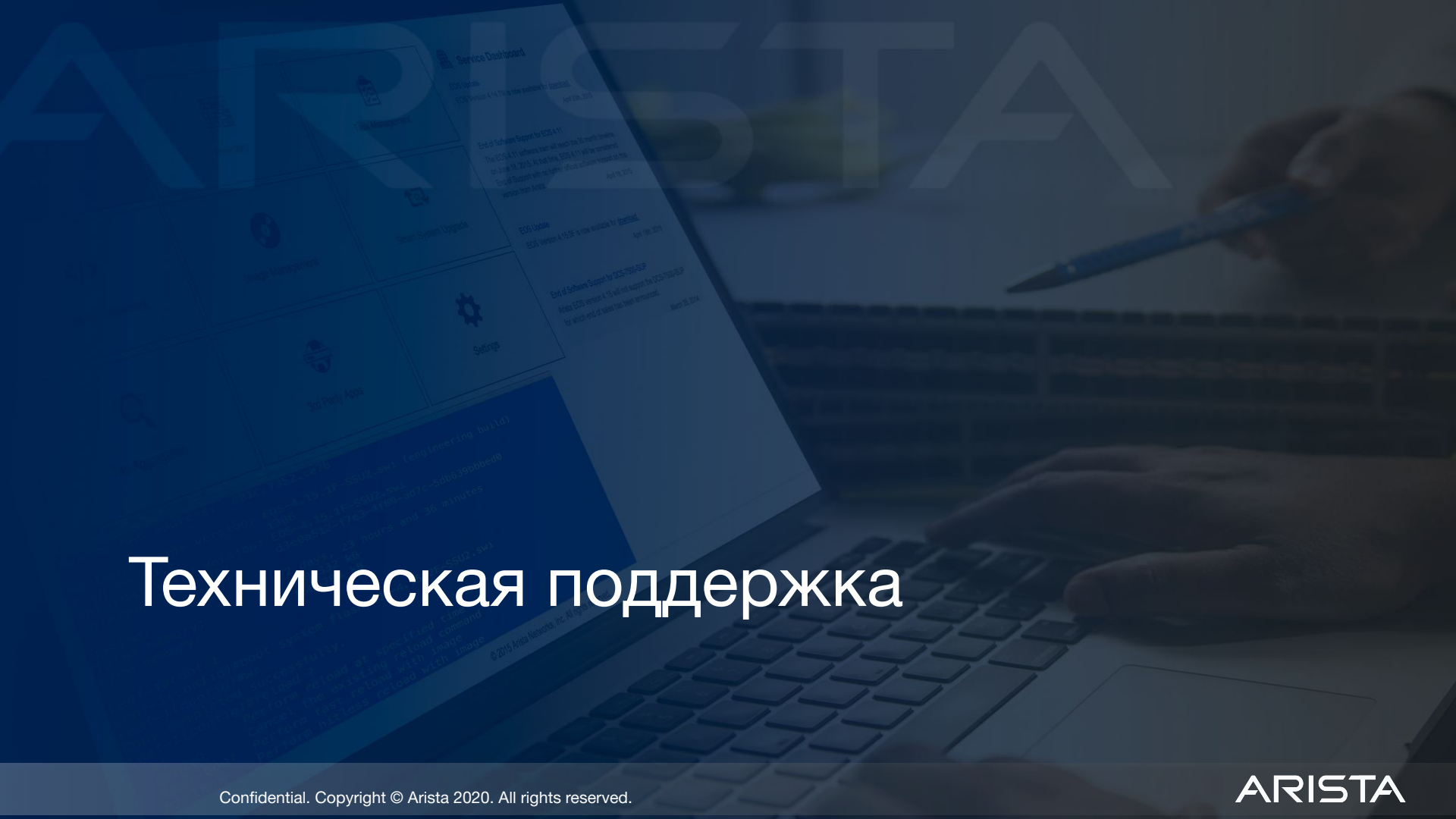
Полезные ссылки

Детали лицензирования доступны по следующим ссылкам:

- https://www.arista.com/en/support/product-documentation/eos-feature-licensing
- https://www.arista.com/en/support/product-documentation/eos-feature-licensing#datatab3315

Соответствие коммутаторов категориям:

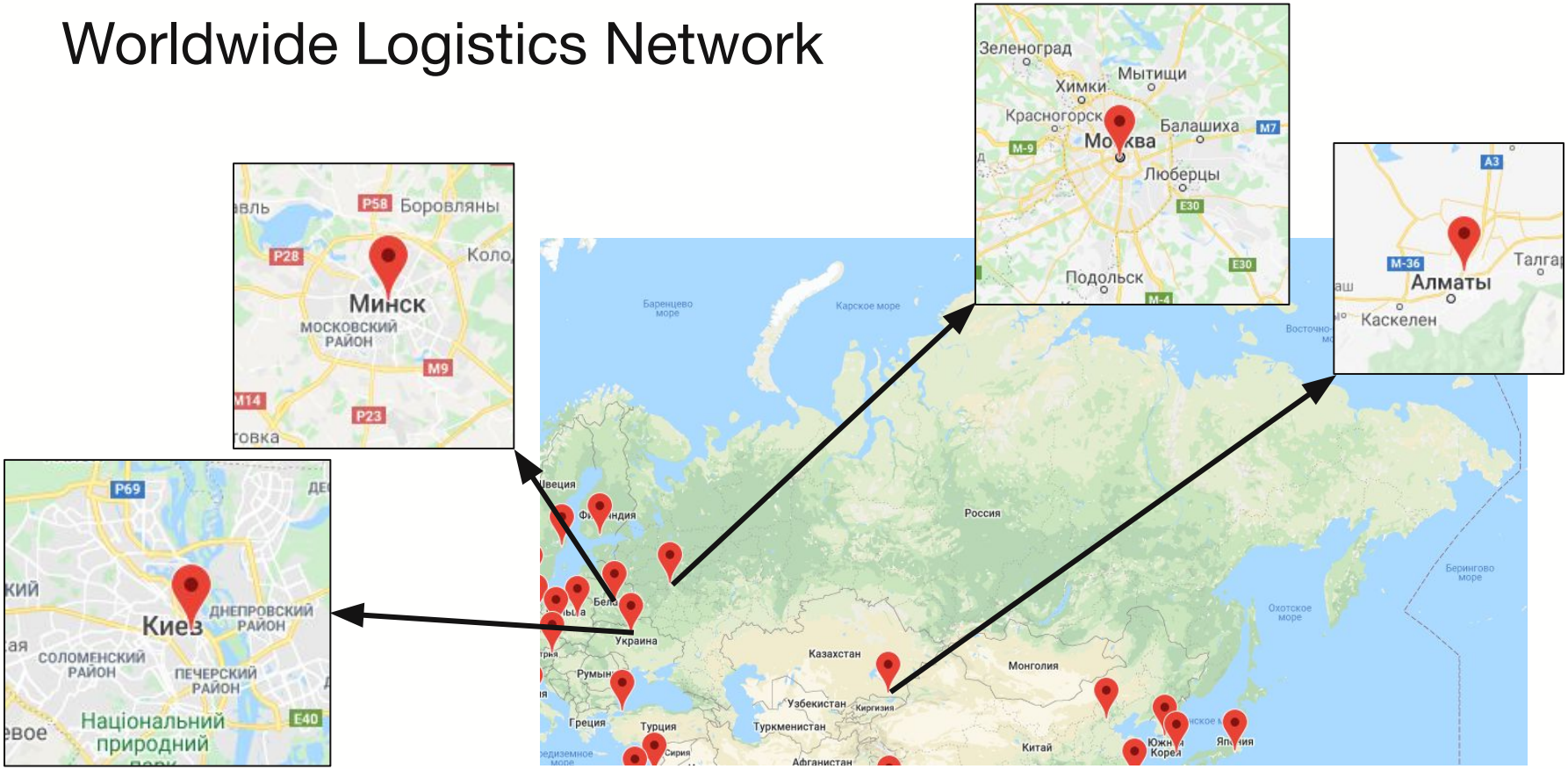
- https://www.arista.com/assets/data/pdf/Software-Licensing-Framework.pdf



Техническая поддержка

ARISTA

Worldwide Logistics Network



154 active depots – 75 North America, 30 APAC, 49 EMEA Additional depots brought online as needed

More details: https://www.arista.com/assets/data/pdf/Global-Service-Depots.pdf

ARISTA

Arista A-Care Service Offerings

	A-Care Services
TAC Support	24x7x365
Software Download	Unlimited
Online Case Management	✔
Arista Community Forums	✔
Advance Replacement of Hardware	✔
RMA service level	Next Business Day, 4 Hour, or 2 Hour service levels
Onsite hardware replacement	Optional
Extended Services	1 Year or 3 Year Service Options

Global TAC Support

Worldwide support distributed between four major TAC centers of excellence

ARISTA

Arista Case Priority Levels

SR Priority Level	Customer Impact	Arista Networks Responsibilities	Customer Responsibilities
P1	Critical	Response within one hour, both during standard business hours and after hours. Arista Networks will work with the customer using all required resources until a solution is found or workaround is in place.	The customer will dedicate a technically appropriate resource who will be available to work with Arista Networks until resolution, both during normal hours and after hours.
P2	Significant	Response within one hour during standard business hours. Arista Networks will work with the customer during standard business hours until a solution is found or workaround is in place.	The customer will provide a technically appropriate resource who will be available to work with Arista Networks during normal hours until resolution.
P3	Acceptable	Response within one hour during standard business hours. Arista Networks will work with the customer during standard business hours until the issue is resolved.	The customer will provide a technically appropriate resource who will be available to work with Arista Networks during normal hours until resolution.
P4	Administrative	Response within twenty four hours during standard business hours. Arista Networks will work with the customer during standard business hours until the issue is resolved.	The customer will provide a technically appropriate resource who will be available to work with Arista Networks during normal hours until resolution.

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