



**ARISTA**

# Automatisierter Netzwerkbetrieb Status Quo und Zukunft

Arista Networks

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# Wer ist Arista Networks?

- Gegründet 2004 von **Andreas von Bechtolsheim**
- Hauptsitz in Santa Clara, Kalifornien
- Börsennotiert seit 2014 aber mehrheitlich in **Privatbesitz**
- Bewertet mit ca. **140 Milliarden €**
- **Jahresumsatz >7 Milliarden US-Dollar**
- Zweitgrößter Hersteller von **Netzwerk Lösungen**



# Gründer & Management

**Andy Bechtolsheim**  
Founder, Chief Architect  
and Chairman

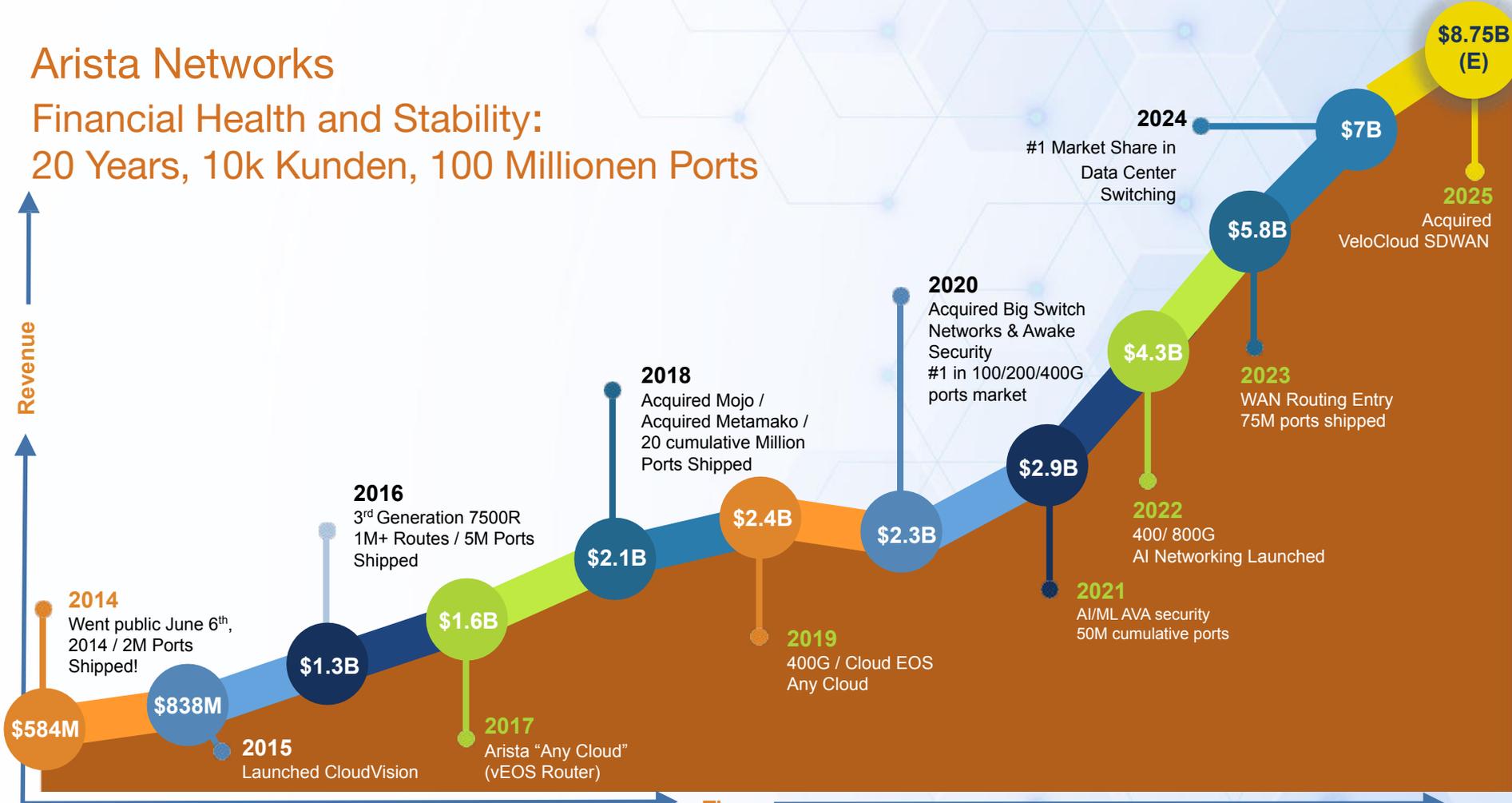
**Jayshree Ullal**  
President and CEO



**Kenneth Duda,**  
CTO, SVP Software Engineering

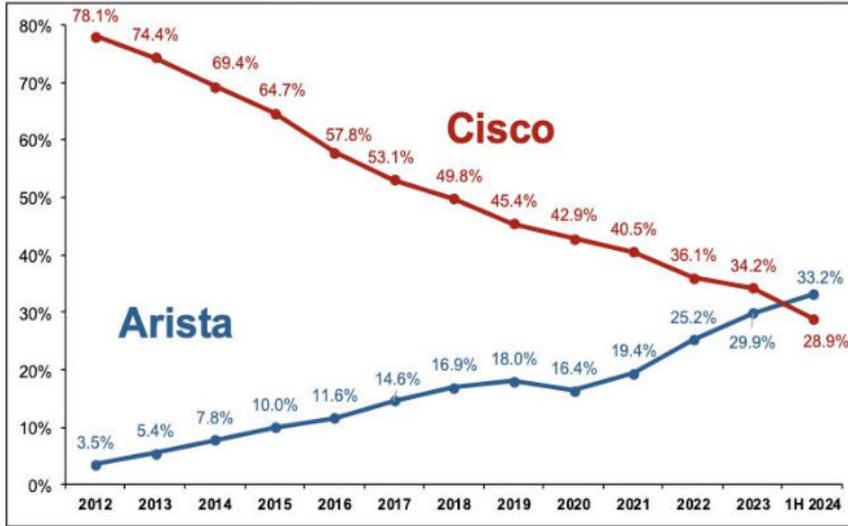
# Arista Networks

## Financial Health and Stability: 20 Years, 10k Kunden, 100 Millionen Ports

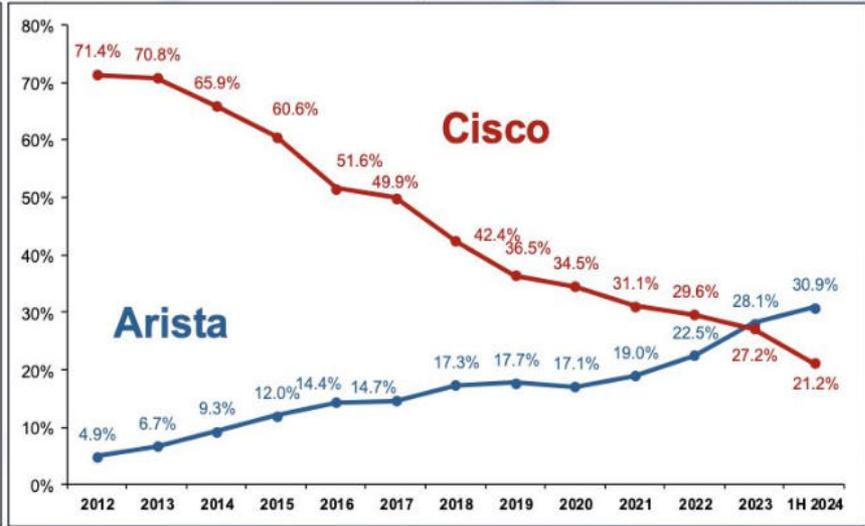


# Market Share in Bewegung

## Share in Dollars



## Share in Ports



Source: Crehan Research Data Center Switch Market Share Report 2Q'24

Note: 10GbE and Higher - Excludes blade switches

**Strong, Continual Share Gains Continue Into 2024**

# Was haben diese Switches gemein?

710P (64 Gb/s)  
12x1G, 2x10G



EOS-4.30.5M.swi  
(same file)



7816R3  
(460Tb/s)  
576x 400G  
768x 100G

# Was haben diese Switches gemein?

710P (64 Gb/s)  
12x1G, 2x10G



Common  
Management  
Automation  
Telemetry/visibility  
Documentation

7816R3  
(460Tb/s)  
576x 400G  
768x 100G



# Lizenzierung

## Feature Lizenzen

- Perpetual
- Vertrauensbasiert
- Keine Seriennummern Bindung
- Keine Lizenz/Registration Keys



## Verschlüsselung Lizenzen

- Perpetual
- Seriennummern Bindung
- Lizenz Keys



# The Arista Way (Kenneth Duda, 15.05.2023)



We will never compromise on quality.

We know our right to build new products depends on our existing products truly working.

We will never take the privilege of being in your network for granted.

We'd rather apologize 100 times for a missing feature or late release, than apologize even once for melting down your network.



Making the network work takes priority over all new development.

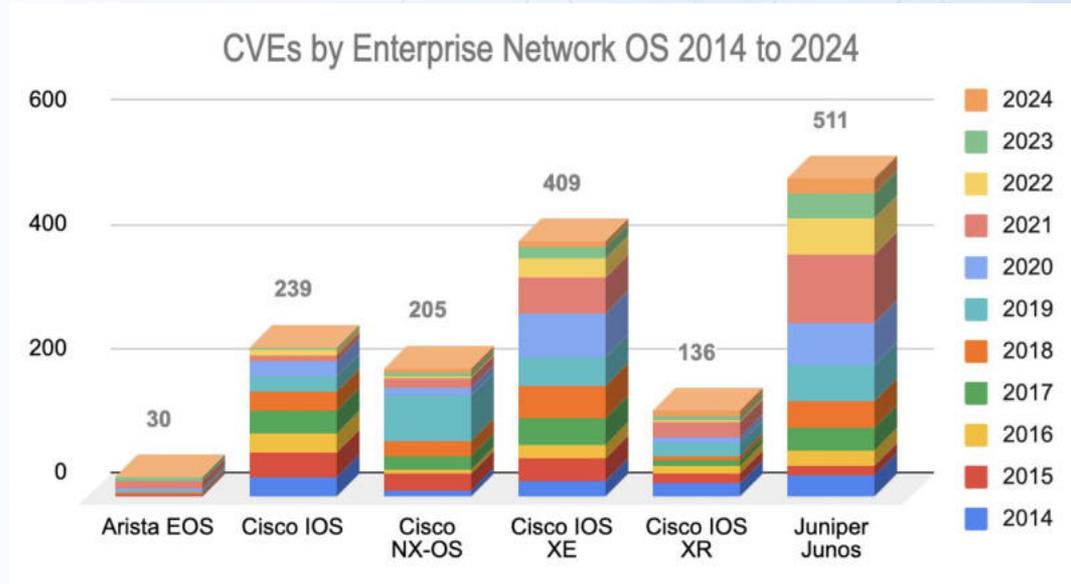
No matter how big or small the customer, no matter how exciting the new feature: new development can wait. Making the network work cannot.

# Stabile Software für stabile Netze

## Kosteneinsparungen durch Innovation - Softwarequalität



- Beste Software Qualität in der Industrie
- Geringste Anzahl an CVEs\*
- Weniger Einfallstore für Angreifer
- Weniger Aufwand für Patching
- Niedrigere Betriebskosten



\*Common Vulnerabilities and Exposures - Gemeinsame Schwachstellen und Gefährdungen, erhoben durch US-Regierung

<https://cve.mitre.org/about/>  
<https://cve.mitre.org/cgi-bin/cvekey.cgi?keyword=NX-OS>  
<https://cve.mitre.org/cgi-bin/cvekey.cgi?keyword=EOS>

ARISTA

Was macht Arista Networks?

# Was macht Arista Networks?

## Datacenter & Routing

- Leaf & Spine
- Fix & Modular
- Data Center Features
- L2/3, ECMP und VXLAN Fokus
- Echtzeit Telemetrie
- 1/10/25/40/50/100/200/400G/800G



## Campus

- Leaf & Spine, Access
- Segmentierung, Visibilität und Sicherheit
- mGig und 25/100G
- PoE Support bis 90W
- Controllerless WiFi
- WiFi 6, 6E, 7



## Observability

- SDN gestützte Netzwerk Visibilität
- Proaktive Risikoanalyse
- 360° Rundumsicht
- Integrierte Workload/Applikation und Infrastruktur Visibilität
- Echtzeit Impact Analysis



## Security

- Ermöglichung von Universal Zero Trust Networking
- AI gestützte Erkennung zum Aufdecken von Angriffen
- Multi-Domain Segmentierungs-Services
- AI Unterstützung zur Vereinfachung von administrativen Aufgaben



## Cloud and Data Center

7388X, 7368X, 7358X, 7060X(AI), 7050X Series

- High density leaf & Large radix Spine
- ToR, MoR, EoR options
- Rich DC oriented features
- L2/3, ECMP and VXLAN focused
- Streaming Telemetry and MACsec
- 1/10/25/40/50/100/200/400G



- Variety of form factors
- Rich segmentation, visibility and security
- Consistent features with DC
- Broad options with mGig and 25/100G
- PoE support up to 90W

7050X3, 750X, 720X, 720P, 710P Series  
**Campus and Branch**

## Core Routing & Intensive Workloads

7280R3/R3A, 7500R3, 7800R3/R4(AI), 7700R4(AI) Series

- High scale, full featured routing solutions
- Deep Buffer, VOQ architecture
- High capacity scaling
- MPLS, EVPN, SR + DC features
- Metro and long haul with TunnelSec
- Fixed and Modular form factors
- 1/10/25/40/50/100/200/400G



- Highly programmable pipelines
- Complex L2/3/4 operations
- Application specific solutions
- Server offload and acceleration
- Finance, SP, Cloud, Web profiles
- Ultra-low latency and Layer 1

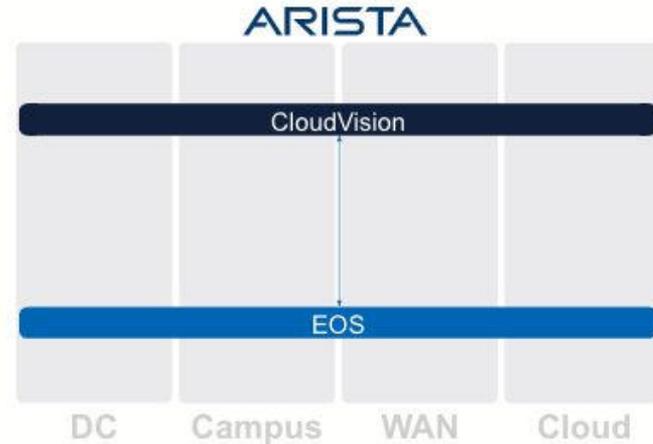
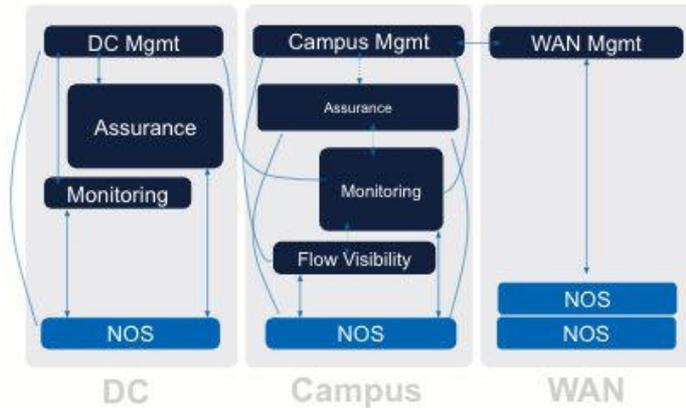
7130, 7170 Series  
**Specialist Applications**

**EOS**

Cloud, Big Data, AI, Storage, Data Center, Broadcast, WAN, SP, IXP, Campus, Multi-cloud

# Vereinheitlichung & Vereinfachung

Kosteneinsparungen durch Innovation - 1 Betriebssystem & 1 Management



Netzbetriebs-Teams können ein einheitliches  
Betriebshandbuch nutzen für:

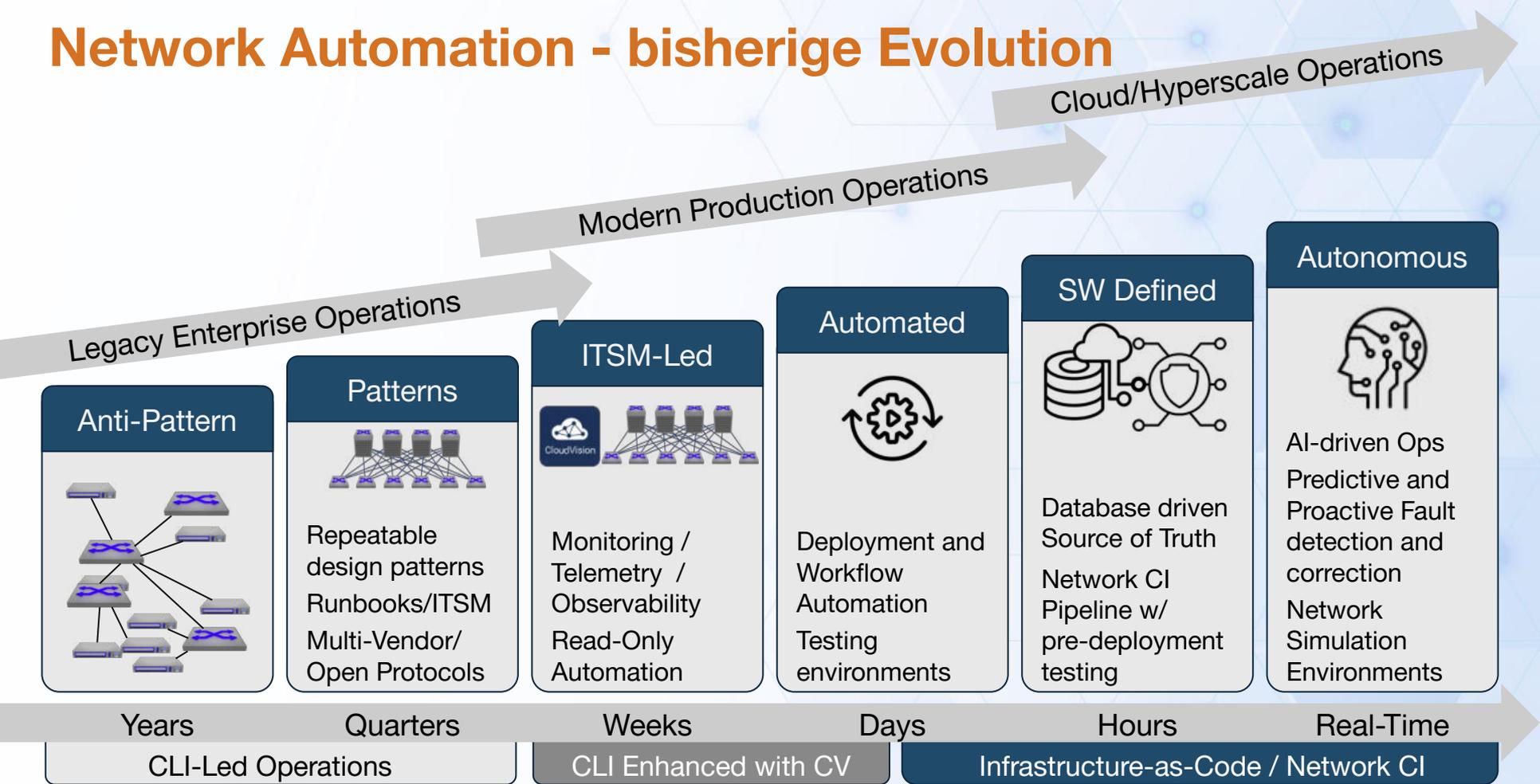
- Upgrades
- Zertifizierungen
- Lifecycle Management
- Schwachstellen Management
- Netzwerk Design
- Troubleshooting
- Automatisierung
- Management Plattformen
- Ökosystem Integration
- Und mehr...



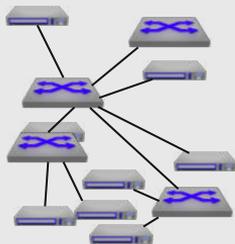
ARISTA

# Automation, Management und Betrieb von Netzen

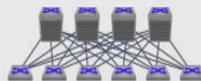
# Network Automation - bisherige Evolution



## Anti-Pattern



## Patterns



Repeatable design patterns  
Runbooks/ITSM  
Multi-Vendor/  
Open Protocols

## ITSM-Led



Monitoring /  
Telemetry /  
Observability  
Read-Only  
Automation

## Automated



Deployment and  
Workflow  
Automation  
Testing  
environments

## SW Defined



Database driven  
Source of Truth  
Network CI  
Pipeline w/  
pre-deployment  
testing

## Autonomous



AI-driven Ops  
Predictive and  
Proactive Fault  
detection and  
correction  
Network  
Simulation  
Environments

# Enterprise Network Evolution

Modern Operating Model

Autonomous Software-led NaaS

Modern Engineering Blueprints

## Prescriptive Design Patterns



Repeatable design patterns  
Scalable, Federated, Open  
Protocols

## Infrastructure-as-Code



Workflow Automation, Telemetry-based  
troubleshooting  
Procedural configuration, testing, and  
documentation generation - no CLI  
Arista Continuous Integration Pipelines  
Functional Virtual Twins for Simulation

## Network-as-a-Service



Autonomous and automated  
network operations, software-led  
and delivered  
AI-driven Operations:  
Predictive and Proactive Fault  
detection and correction  
Digital Twinning Simulation  
Environments

CloudVision Application Platform

NaaS/Infrastructure-as-Code / Network CI

# Netzwerk Management Ansätze

Volle Flexibilität



Kunden Spektrum



**D.I.Y.**

Integration von selbst entwickelten Tools

Software Development Ansatz



EOS SDK  
eAPI



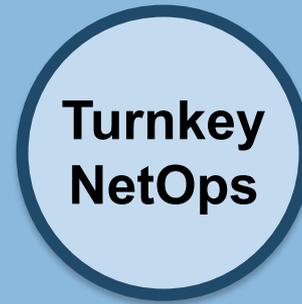
**DevOps**

Nutzung von existierenden Konfigurations-Management Tools (Puppet, Chef, Ansible)

Integration und Management via Skript



EOS DevOps Toolkit  
Ruby/Python Object Model



**Turnkey  
NetOps**

Ablösung von limitierten, veralteten Management Lösungen

Schlüsselfertige Management Lösung



CloudVision

# Arista AVD - Architect, Validate, Deploy



- Erweiterbare, netzwerkweite Modelle, die die Konfiguration vereinfachen, Konsistenz gewährleisten und Fehler reduzieren
- Prozedurale Generierung von Konfiguration und Dokumentation
- Validierungsfunktionen durch Testautomatisierung
- Integration mit GitOps, CloudVision und weiteren 3rd Party Tools

Open sourced: <https://avd.arista.com/>



# CloudVision: Einheitliche Netzwerk Automatisierung

## Automatisierte Deployments

Zero Touch, netzwerk-weite Konfig Modelle, Pre-Deployment Workflows

## Change Controls

Netzwerke-weite Upgrades, Rollback und Snapshots

## Compliance / Risk

Durchgehende Bewertung, Reporting und Korrektur von Abweichungen, Schwachstellen und Bugs

## Echtzeit Telemetrie

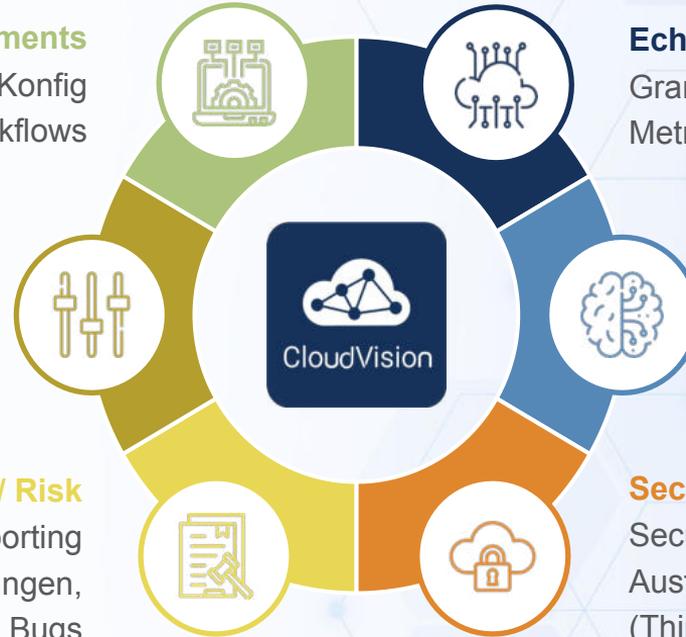
Granulares "State Streaming" für Metriken, Flows, Events uvm

## Cognitive Analytics

Trend Analysen, vorausschauende Algorithmen für Zustand von Netzwerk und Applikationen

## Security Services

Security Policy Management / Ausführung, Policy / Identity Integration (Third Party), Wireless IPS



**Eine Plattform für konsistenten Netzwerk Betrieb**

# CloudVision: Prebuilt Advanced Telemetry + Automation

### Compliance Dashboards

**Bug Exposure**  
269 Devices  
179 Exposed to high priority bugs  
90 No known bugs detected

**Security Advisories**  
269 Devices  
13 No known PSIRTs detected  
43 Exposed

**Configuration and Software Image**  
269 Devices  
116 Compliant  
153 Out of Compliance

### Real-Time Topology Views

### Network-Wide Host Search

### Hitless Patching

View in Topology

EOS-4.24.3M

- 1 EOS-4.24.3M.swi  Reboot Required
- 2 TerminAbt-1.10.5-1.swi  Reboot Required

### Network-Wide Rollback

Name	IP Address
BLD-A-LVL3-S...	192.168.101.81
BLD-A-LVL3-S...	100.100.101.82
DC1 (4)	101.83
DC2 (4)	101.84
	101.86
	101.87
	101.88
D-A-SPLINE-1	192.168.101.90
D-A-SPLINE-2	192.168.101.91

### Data Plane & Endpoint Visibility

### Monitor Real-Time PoE Usage

Campus Power

Power over Ethernet Utilization for all campus devices.

56 endpoints

Device	Streaming Status	Total Power Ap...	Total Power Di...	Total Power Co...	Mean of Device...
HQ-IDF-Leaf1	Active	700.0 W	865.0 W	438.0 W	1.0 Mbps
HQ-IDF-Leaf5	Active	888.0 W	828.0 W	308.2 W	3.4 Mbps
HQ-IDF-Leaf3	Active	740.0 W	705.0 W	341.0 W	0.8 Mbps

### Anomaly Detection

**Anomaly in CloudTracer latency metric on Oslo**  
Lasted 20 minutes - Mar 11, 2020 14:07:14 GMT - 37 hours ago  
Event on Oslo: Detected anomaly in CloudTracer latency metric for host www.bbc.co.uk

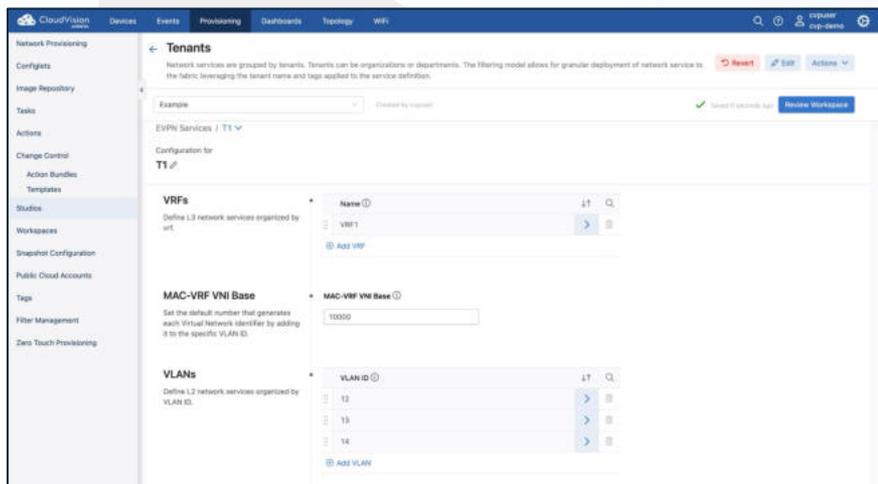
### Early Warning on Congestion

**Queue size above threshold on Ethernet1 on HQ-IDF3-Leaf**  
Lasted 9h - Started Nov 17, 2020 13:13:14 (22h ago)  
Event on Ethernet1 on HQ-IDF3-Leaf: Queue size above threshold of 3000.0

**Latency Analyzer (LANZ)**

LANZ Queue Drops	2,497 drops
LANZ Queue Length	8,211 segments
LANZ Transmit Latency	975,346,634 ns

# CloudVision Studios



## Simplified Config Management with New Declarative Model

### Key Features → Benefits

- Point-n-Click Network Automation → Instantly spin-up Arista Validated Network Designs with guided workflows
- Flexible Config 'Wizards' → Craft customizable, user-specific workflows
- Network-wide Data models → Abstractions for simpler automation of network-wide changes

Bringing Agility to Network Config Management

The ARISTA logo is displayed in a bold, dark blue, sans-serif font in the top left corner. The background of the slide features a complex network of blue hexagons and lines, with some hexagons highlighted in a darker shade of blue, creating a digital or network-like aesthetic.

# ARISTA

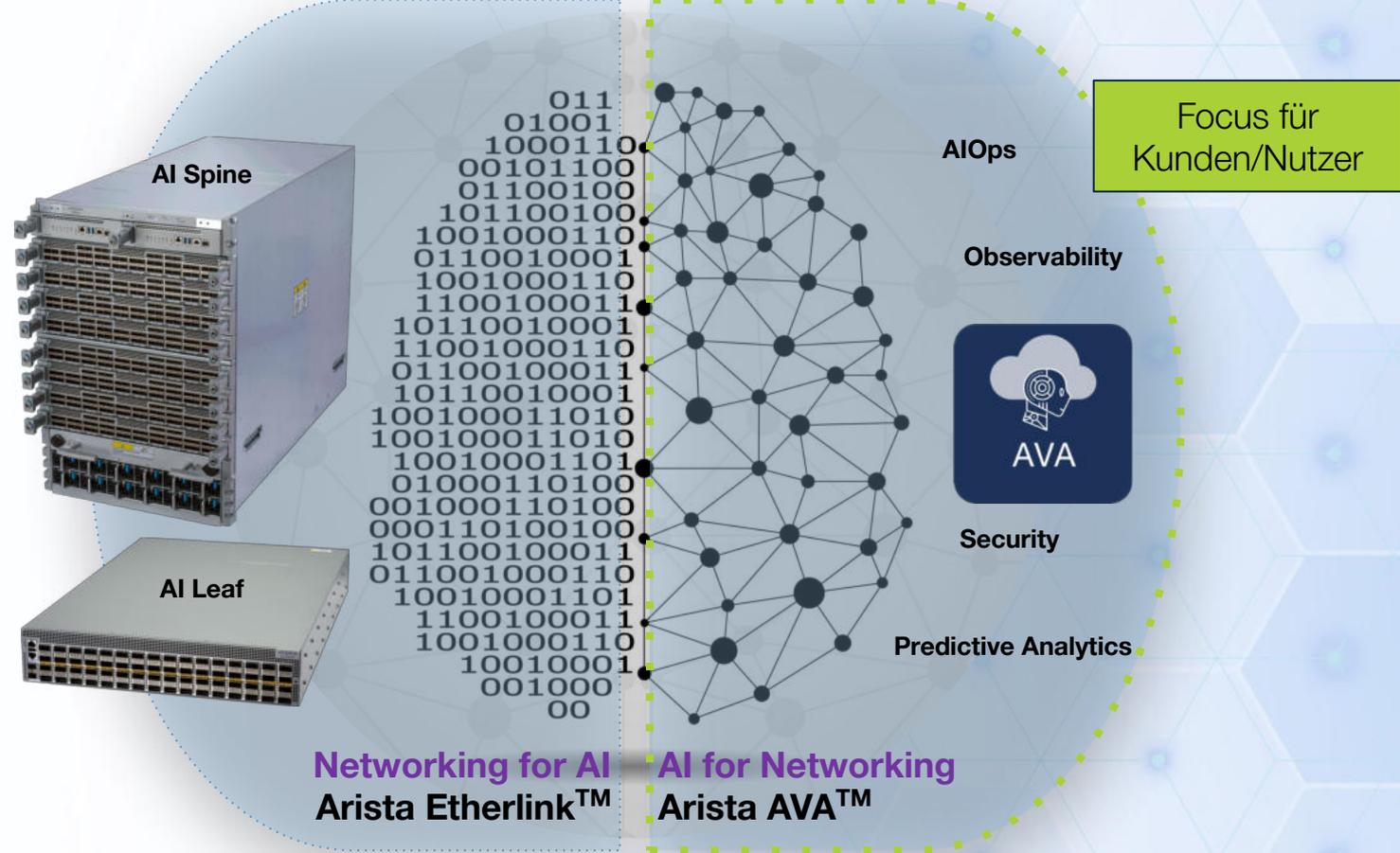
## Überall KI / AI

Wohin geht die Reise in Sachen Management von Netzen?

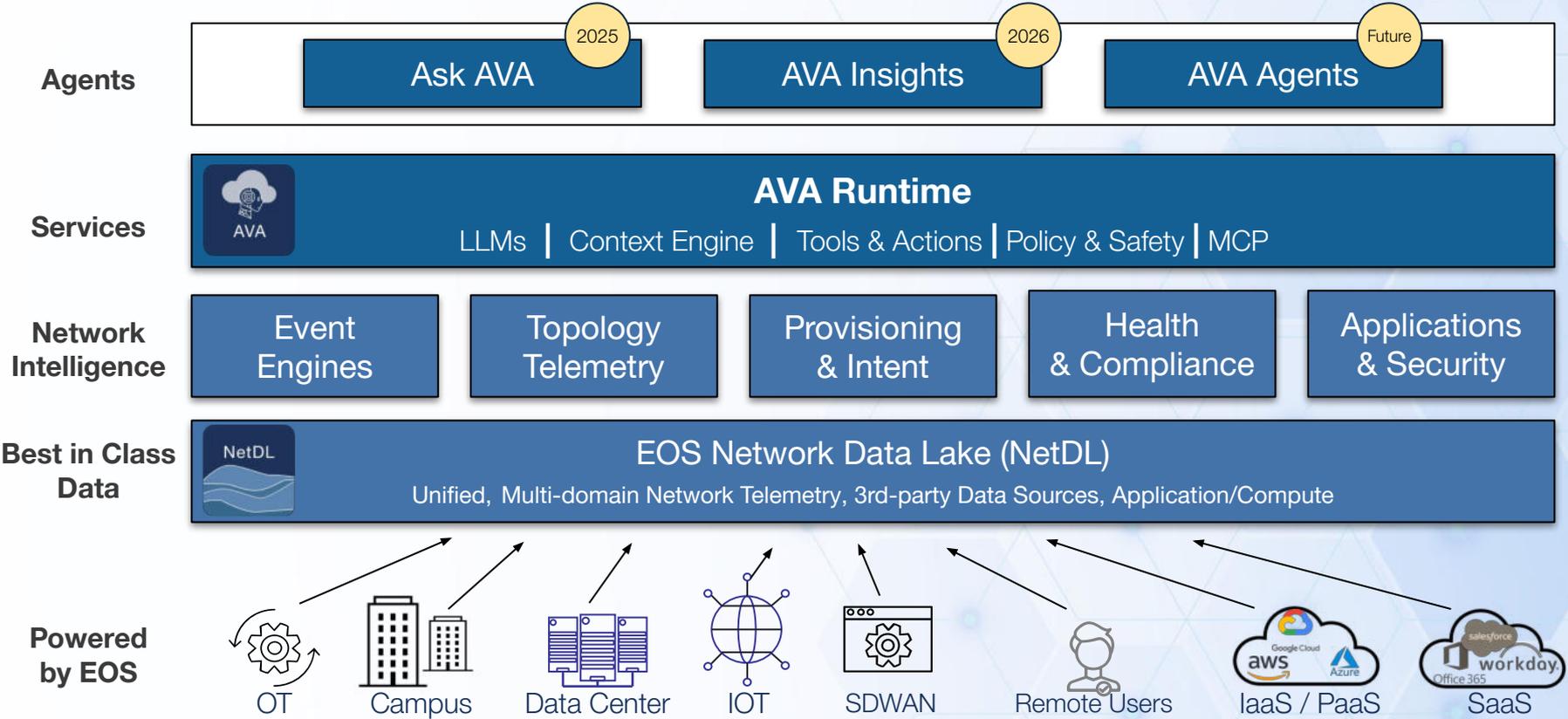
# Marketing im KI Zeitalter



# ARISTA



# KI Stack in der Netzwerkinfrastruktur



# AVA - AIOps Network Assistant



## Incident detection and resolution

**A** AVA, can you tell me the health of BGP in my New York datacenter?



## Knowledge base and how-to's

**A** AVA, how do I create a VLAN trunk and a series of VLANs?

## Smarter security and compliance

**A** AVA, what switches are not compliant and how do I fix?



## Proactive problem solving

**A** AVA, what switches show health trends that may be an issue?

## Cost optimization & scalability

**A** AVA, tell me about branch uplinks that are below 50% utilized?



## Enhanced network performance

**A** AVA, is my AI cluster experiencing performance issues? Nodes?



Ask AVA<sup>+</sup>



Ask a Question

Or choose an example prompt below to get started



Find Devices with streaming issues

Displays a current list of devices experiencing streaming issues.



Show all Events in the last 24 hours

Displays the last 24 hours of events by device and severity.



Visualize Device CPU Usage

Creates a line graph of the top 10 devices reporting high CPU utilization.



Find Important Syslog Events

Summary of syslog events that may require user attention.

Q WJ



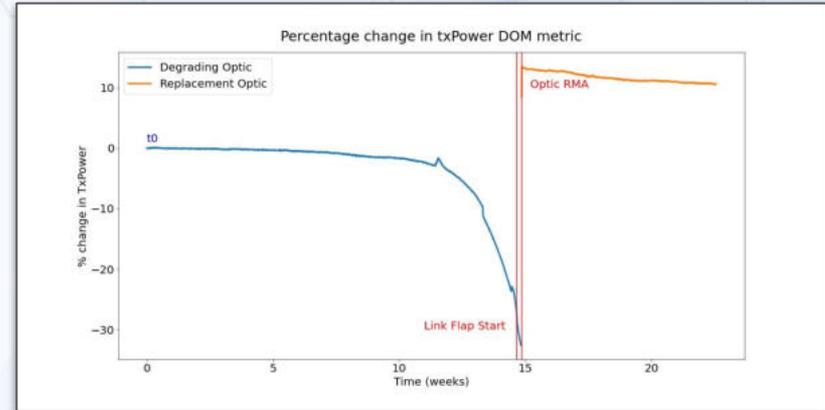
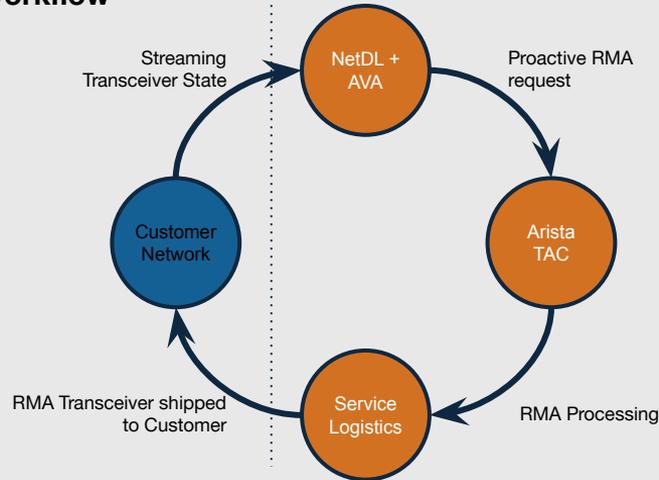
AI-generated responses. Confirm accuracy before use.

CV-C01E-11-2	Active	7260R2-60	4.32.1F	1.32.99_devel	10.90.172.110	74-63:8f:09-82-09	E05	55316429039
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# CloudVision und AVA in Action -> 'Auto RMA'

## Example: Transceiver Failure Detection + TAC Integration

### End to End Workflow



- Engineering team worked closely with 2 large customers
- 22K optics monitored through CloudVision over 1 year
- 16 failures predicted and then confirmed
- 0 false positives
- Deploying across all CVaaS customers now
- Starting proactive RMAs with TAC

The image features the Arista logo in the top left corner. The background is a light blue gradient with a pattern of hexagons and lines, some of which are highlighted in a darker blue. The overall aesthetic is clean and modern, typical of a corporate presentation.

ARISTA

# Probefahrt?

Jederzeit mit dem Arista Test Drive

# Arista Test Drive

## We provide the car ... you drive!

The screenshot shows the Arista ATD Lab Guides website. The header includes the Arista logo, the text "Arista ATD Lab Guides", a version dropdown set to "2024.3", and a search bar. A navigation menu lists various lab categories: ATD Labs Overview, Campus, Data Center, Advanced Routing, Automation, CloudVision Portal, Media & Entertainment, Troubleshooting Training, and Arista Graduate. The main content area features a sidebar with "ATD Labs Overview" and "Site Navigation" (with sub-links for "Accessing the Labs", "Campus Topology", and "Advanced Routing Topology"). The main heading is "ATD Lab Overview". The text explains that the site contains different labs for various Arista ATD topologies and provides instructions on how to navigate and match topology diagrams. A table with three tabs is shown, with "Dual Data Center" selected. The table lists several topology categories: Data Center, Automation, CloudVision Portal, Media & Entertainment, Troubleshooting Training, and Arista Graduate (with a note that it must be deployed with CVP version bare). The page concludes with a link to the "Accessing The Labs" section and a date stamp of 2025-03-25.

**Arista ATD Lab Guides** 2024.3 Search

ATD Labs Overview Campus Data Center Advanced Routing Automation CloudVision Portal Media & Entertainment Troubleshooting Training Arista Graduate

ATD Labs Overview  
Site Navigation  
Accessing the Labs  
Campus Topology  
Advanced Routing Topology

## ATD Lab Overview

Welcome to the Arista ATD Lab Guides site. This site contains many different labs for use with the ATD topologies Arista offers. One thing you may notice at the top left of the screen is a drop down box with what looks like a CVP version. That number specifies which version of CloudVision the guides you are currently viewing work with. The ATD environment should automatically place you on the correct version of the site, but if it doesn't you can easily switch between them. Additionally, while there are many different labs, they are written and designed to work with a certain ATD topology. The following table will help you navigate which labs in which section headings work with which topologies. The heading of each table section lists the ATD topology, and in that column, the corresponding labs that work with it. If you aren't sure which topology you are working on, refer to the topology access pages over to the left and match up the topology diagram with yours, or ask your SE or ATD leader:

Dual Data Center	Advanced Routing	Campus
<ul style="list-style-type: none"><li>Data Center</li><li>Automation</li><li>CloudVision Portal</li><li>Media &amp; Entertainment</li><li>Troubleshooting Training</li><li>Arista Graduate (Must deploy topology with CVP version <b>bare</b>)</li></ul>		

Continue on to the [Accessing The Labs](#) section to the left to learn about accessing the various parts of the ATD labs.

🕒 2025-03-25

# Arista Test Drive

We provide the car ... you drive!

ARISTA

Lab Guides

Console Access

Programmability IDE

WebUI

CVP

Event Alert API

Jenkins

IPAM

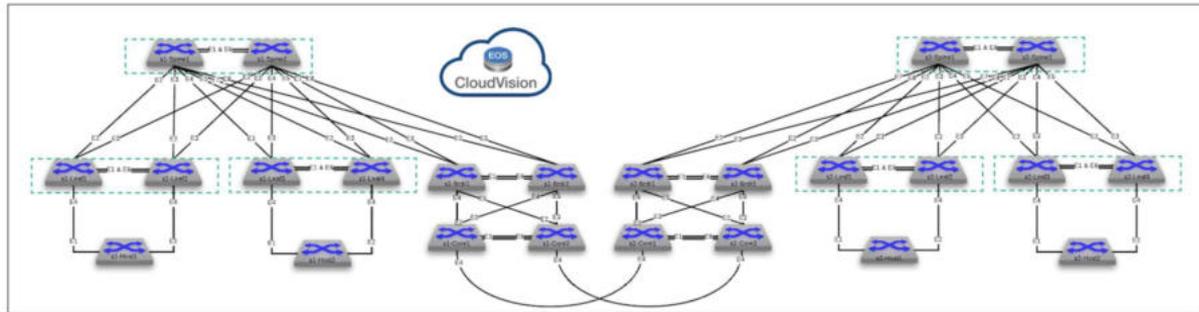
## Arista Dual Data Center Lab

Welcome to the Arista Dual Data Center Lab! Please use the links on the left to navigate through the lab.

Time Remaining: 07:22:16

### Topology

Click on a device to access CLI.



### CVP 2024.3.1 is currently UP

No pending tasks in CVP.

### Usernames and Passwords

Use the following usernames and passwords to access the ATD:

Device	Username	Password
Lab Credentials	arista	arista!9d9
Programmability IDE		arista!9d9
WebUI		@rista1

# Arista Test Drive

Data Center

Overview

Layer 2 Leaf-Spine

Preparing The Lab

Lab Tasks

Layer 3 Leaf-Spine (BGP)

Layer 3 Leaf-Spine (OSPF)

VXLAN

L2 EVPN Services

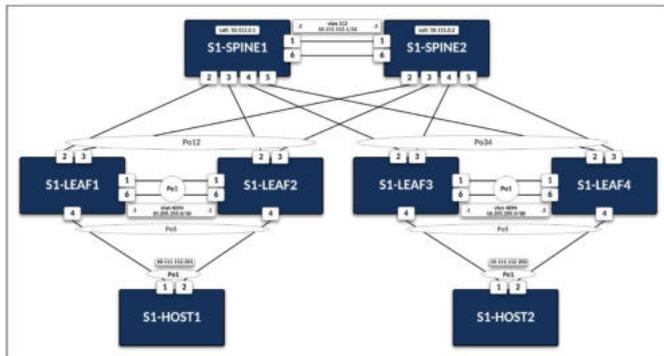
L3 EVPN Services

L2 and L3 EVPN - Symmetric IRB with MLAG

L2 and L3 EVPN - Symmetric IRB with All-Active Multihoming

CloudVision Studios

## Layer 2 Leaf-Spine Lab



Note

The manually entered commands that are part of this lab are equivalent to `l2ls_s1-leaf4_cop1.txt`.

## Preparing The Lab

1. Log into the LabAccess jumpserver:

a. Type `l2ls` at the Main Menu prompt.

Info

Did you know the `l2ls` script is composed of Python code that uses the CloudVision Portal REST API to automate the provisioning of CVI. The configlets that are configured via the REST API are `l2ls_s1-spine1`, `l2ls_s1-spine2`, `l2ls_s1-leaf1`, `l2ls_s1-leaf2`, `l2ls_s1-leaf3`, `l2ls_s1-leaf4`.

b. The script will pre-configure the topology with the exception of `s1-leaf4`. The main task is to configure this dev

Data Center

Overview

Layer 2 Leaf-Spine

Layer 3 Leaf-Spine (BGP)

Layer 3 Leaf-Spine (OSPF)

VXLAN

L2 EVPN Services

L3 EVPN Services

L2 and L3 EVPN - Symmetric IRB with MLAG

L2 and L3 EVPN - Symmetric IRB with All-Active Multihoming

CloudVision Studios

## Data Center Labs

### Layer 2 Leaf-Spine

This lab builds a layer 2 leaf-spine underlay fabric utilizing MLAG and vARP.

→ Access This Lab

### Layer 3 Leaf-Spine (OSPF)

This lab builds a layer 3 leaf-spine fabric utilizing the OSPF protocol for underlay routing.

→ Access This Lab

### L2 EVPN Services

This lab builds a layer 3 leaf-spine fabric utilizing the BGP protocol for underlay routing. It uses the BGP EVPN address family and VXLAN for layer 2 extension across leaf pairs, using the default vrf.

→ Access This Lab

### L2 and L3 EVPN - Symmetric IRB with MLAG

This lab builds a layer 3 leaf-spine fabric utilizing the BGP protocol for underlay routing. It uses the BGP EVPN address family and VXLAN for layer 2 extension across leaf pairs, using a non-default vrf for endpoint traffic, and MLAG as the multihoming model for the hosts connected to the leaf pairs.

→ Access This Lab

### Layer 3 Leaf-Spine (BGP)

This lab builds a layer 3 leaf-spine fabric utilizing the BGP protocol for underlay routing.

→ Access This Lab

### VXLAN

This lab builds a layer 3 leaf-spine fabric utilizing the BGP protocol for underlay routing, and VXLAN for layer 2 extension across leaf pairs.

→ Access This Lab

### L3 EVPN Services

This lab builds a layer 3 leaf-spine fabric utilizing the BGP protocol for underlay routing. It uses the BGP EVPN address family and VXLAN for layer 2 extension across leaf pairs, using a non-default vrf for endpoint traffic.

→ Access This Lab

### L2 and L3 EVPN - Symmetric IRB with All-Active Multihoming

This lab builds a layer 3 leaf-spine fabric utilizing the BGP protocol for underlay routing. It uses the BGP EVPN address family and VXLAN for layer 2 extension across leaf pairs, using a non-default vrf for endpoint traffic, and the AA LAG ESI groups multihoming model for the hosts connected to the leaf pairs.

→ Access This Lab

# Arista Test Drive

We provide the car ... you drive!

```
*****  
****Jump Host for Arista Test Drive****  
*****
```

```
=====Main Menu=====
```

Please select from the following options:

1. Reset All Devices to Base ATD (reset)
2. Layer 2 Leaf-Spine Lab (l2ls) - Site 1 Only
3. Layer 3 Leaf-Spine Lab with BGP (l3ls) - Site 1 Only
4. Layer 3 Leaf-Spine Lab with OSPF (l3ls-ospf) - Site 1 Only
5. VXLAN Static Flood List Lab (vxlan) - Site 1 Only
6. CloudVision Portal Lab (cvp) - Site 1 Only
7. CVP lab for Studios L3LS/EVPN (studiosl3ls)

97. Additional Labs (labs)
98. SSH to Devices (ssh)
99. Exit LabVM (quit/exit) - CTRL + c

What would you like to do?: █

```
*****  
****Jump Host for Arista Test Drive****  
*****
```

```
=====Device SSH Menu=====
```

Screen Instructions:

- \* Select specific screen - Ctrl + a <number>
- \* Select previous screen - Ctrl + a p
- \* Select next screen - Ctrl + a n
- \* Exit all screens (return to menu) - Ctrl + a \

Please select from the following options:

1. s1-brdr1 (s1-brdr1)
2. s1-brdr2 (s1-brdr2)
3. s1-core1 (s1-core1)
4. s1-core2 (s1-core2)
5. s1-host1 (s1-host1)
6. s1-host2 (s1-host2)
7. s1-leaf1 (s1-leaf1)
8. s1-leaf2 (s1-leaf2)
9. s1-leaf3 (s1-leaf3)
10. s1-leaf4 (s1-leaf4)
11. s1-spine1 (s1-spine1)
12. s1-spine2 (s1-spine2)
13. s2-brdr1 (s2-brdr1)
14. s2-brdr2 (s2-brdr2)
15. s2-core1 (s2-core1)
16. s2-core2 (s2-core2)
17. s2-host1 (s2-host1)
18. s2-host2 (s2-host2)
19. s2-leaf1 (s2-leaf1)
20. s2-leaf2 (s2-leaf2)
21. s2-leaf3 (s2-leaf3)
22. s2-leaf4 (s2-leaf4)
23. s2-spine1 (s2-spine1)
24. s2-spine2 (s2-spine2)

Other Options:

95. Connect to CVP Console (console) - Type 'console cvp1' after connecting
96. Screen (screen) - Opens a screen session to each of the hosts
97. Back to Previous Menu (back)
98. Shell (shell/bash)
99. Back to Main Menu (main/exit) - CTRL + c

What would you like to do?

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Thank You

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