

# CAMPUS

## Operations & Engineering



### Arista Academy Campus Track

The Campus track equips network professionals with the knowledge and skills required to configure, troubleshoot, and manage Arista Layer 2 and 3 Campus network designs. You will explore key topics such as Arista Campus Architecture, CloudVision (CVP/CV-CUE), Layer 2 and 3 Wired Campus Networks, Wireless Fundamentals, Campus Wireless Deployment, and Campus Security. This course also includes hands-on labs to reinforce theoretical knowledge with practical application. The Campus track is divided into two distinct sub-tracks: Operations and Engineering. The Operations sub-track focuses on Day-2 tasks such as telemetry and troubleshooting, while the Engineering sub-track concentrates on the design and architecture of L2 campus networks.

### Who Should Enroll

Network engineers and administrators managing campus network infrastructure and responsible for troubleshooting and maintaining campus networks.

### Learning Format

Arista Campus track is available as Self-Paced learning ([Academy Digital](#)) or Private live instructor lead class ([Academy Live](#))

### Skills Developed

- Understand and implement Arista's modern Layer 2/3 Campus network solutions.
- Configure and manage wired and wireless campus networks.
- CloudVision for network automation and management.
- Strengthen campus network security using Zero Trust principles.

### Prerequisites

- Solid understanding of Layer 2/3 network technologies and protocols
- Understanding of Spine/Leaf designs is a benefit

### CERTIFICATION

Campus Operations and Engineering sub-tracks each have an optional practical exam. Achieving both certifications automatically grants you the Campus PROFESSIONAL certification. Alternatively, you may take the PROFESSIONAL exam directly bypassing the SPECIALIST exam.



## Arista campus architecture

### Arista Cognitive Campus Solution

- Arista Cognitive Campus Overview

### Arista campus architecture overview

- Traditional campus architecture overview
- Arista Universal cloud network architecture
- Campus fabric architecture

### Arista Campus Design

- Campus network design options
- Design 1- L2LS with external gateway
- Design 2- L2LS
- Design 3- L2LS with VXLAN-EVPN
- Design 4- L3LS
- Design 5- L3LS with Border leafs
- Design 6- L3LS with VXLAN-EVPN
- Design 7- L3LS with VXLAN-EVPN and Border leafs

### Resiliency solutions

- Cognitive PoE
- Stateful Switchover (SSO)
- Smart System Upgrades (SSU)

### Arista stacking

- SWAG Overview
- SWAG Architecture
- MLAG vs SWAG
- SWAG Provisioning

## Building a L2 wired campus network

### VLANs and Inter-VLAN routing

- VLAN Overview
- Configuring Access and Trunk Ports
- Introduction to Inter-VLAN Routing
- Configuring Sub Interfaces
- Configuring SVIs
- Troubleshooting VLANs
- *Lab - Configuring VLANs*

### Spanning Tree

- Spanning Tree Overview
- STP Enhancements
- Configuring STP on an Arista Switch
- Troubleshooting STP on an Arista Switch
- *Lab - Configuring MSTP*

### LACP

- LACP Overview
- Configuring LACP
- Troubleshooting LACP

## MLAG

- MLAG Overview
- Configuring MLAG
- Troubleshooting MLAG
- *Lab - Deploying MLAG*

## First Hop Redundancy Protocol

- FHRP Overview
- Configuring VRRP
- Configuring VARP
- *Lab - Configuring VARP*

## Build L2LS Campus network using CLI

- Configuring L2LS Campus with CLI

## Build L2LS Campus network using CVP configlets

- L2LS Campus design and topology overview
- Configure L2LS campus with CVP configlets

## Build L2LS Campus network using CVP Studios

- Onboarding devices to Studios
- Configure L2LS network using Studios
- Configure access interfaces
- Submit workspace and execute change control
- Configure L2LS Campus w/ext gateway using Studios
- *Lab - Deploying L2 Campus with Studios*

## Building a L3 wired campus network

### L2LS Review

- L2LS Design Review
- L2LS Example

### L3LS Design

- Introduction to L3LS Design
- VXLAN and EVPN Importance in L3LS Design
- Why BGP Underlay in L3LS Design

### Introduction to BGP

- Introduction to BGP and Routing
- BGP Functions and Facts
- BGP Operation
- BGP Route Advertisement

### eBGP Underlay configuration

- L3LS eBGP underlay configuration
- eBGP load balancing configuration
- eBGP configuration enhancements

**BGP underlay deployment options**

- BGP with MLAG
- Variations of BGP in L3LS
- *Lab – L3LS Campus underlay with eBGP*

**VXLAN Overview**

- Introduction to VXLAN
- VXLAN load balancing with ECMP

**VXLAN Control plane options**

- ARP refresher
- VXLAN Multicast control plane
- VXLAN HER control plane
- Configuring VXLAN HER
- VXLAN VCS control plane
- VXLAN EVPN control plane
- *Lab – Configure VXLAN data plane with HER*

**VXLAN with MLAG**

- Introduction to VXLAN with MLAG
- Configuring VXLAN with MLAG

**VXLAN best practices**

- MTU and Jumbo frames
- DF Bit, VTEP, MLAG, and Timers

**EVPN Fundamentals**

- Introduction to EVPN
- EVPN terminology
- VRF Operations
- MP-BGP control plane
- Configuring MP-eBGP for EVPN
- EVPN route type 2 (MAC-IP)
- EVPN route type 5 (IP Prefix)
- EVPN route type 3 (IMET)
- *Lab – L2 VPN*

**EVPN advanced concepts**

- VLAN based service interface
- VLAN aware bundle service interface
- Introduction to IRB
- Symmetric IRB vs asymmetric IRB
- Symmetric IRB deep dive
- Configuring symmetric IRB
- Configuring asymmetric IRB
- *Lab – L3 EVPN Symmetric IRB*

**EVPN design best practices**

- iBGP between MLAG pairs and eBGP multihop command
- eBGP for underlay and overlay

**Build L3LS Campus network using CVP Studios**

- Configuring L3LS Campus with CVP Studios
- Configuring L3LS Campus with VXLAN and EVPN using Studios
- *Lab – Deploying L3LS Campus with VXLAN and EVPN using Studios*

## Wireless

### Wireless signalling basics

- Introduction to radio frequency waves and signals
- Radio frequency wave properties
- Radio frequency wave propagation

### Measuring wireless signals

- Measuring signal strength
- Antennas
- Radiated power measurement

### Representing data in radio frequency waves

- Modulation
- DSSS vs OFDM
- OFDMA

### Wi-Fi standards

- Radio frequency channels
- 802.11 standards

### WLAN Communications

- 802.11 frames
- Wireless client association
- Wireless frame transmission
- Wireless client roaming

### 802.11 Standards enhancements

- 802.11i MAC security
- 802.11k Radio resource measurement
- 802.11r Fast BSS transition
- 802.11v Wireless network management
- 802.11w Protected management frames
- 802.11e QOS

## Deploying Campus wireless networks

### Campus wireless architecture

- Traditional Campus wireless architecture
- Arista Campus wireless architecture

### Arista CV-CUE

- CV-CUE overview
- Deploying CV-CUE
- Navigating CV-CUE
- Using checkpoints in CV-CUE
- *Lab – Navigating CV-CUE*

### Deploying access points in campus

- Onboarding access points to CV-CUE
- Assigning APs to locations and AP groups
- *Lab – Configuring folders and groups*

### Managing Ap's in CV-CUE

- Configuring AP devices settings
- Connecting AP using LAG
- Configuring AP radio settings

### Configuring network profiles

- Configuring port profiles
- Configuring radius servers
- Configuring role profiles
- Configuring tunnel interfaces

### Configuring basic enterprise SSID settings

- Understanding mandatory SSID settings
- Understanding types of SSID security
- Understanding SSID network types
- Configuring a WLAN with PSK/GPSK
- Configuring a WLAN with 802.1x
- *Lab – Configuring basic SSID settings*

### Configuring advanced enterprise SSID settings

- Enabling access control for clients
- Optimizing RF settings
- Enabling traffic shaping & QOS

### Configuring WIPS

- WIPS overview
- Configuring WIPS settings

## Securing the Campus network

### Zero Trust overview

- Why Zero Trust security
- Zero Trust model
- Zero trust stages
- Challenges with Zero Trust implementation
- Arista Zero Trust solutions

### Security basics

- Security basics overview
- ACL overview
- IP Locking
- IP source guard
- Private VLANs
- AAA overview
- RADsec and RADsec proxy
- Encryption and PKI
- EAP overview
- *Lab – Deploying control plane ACLs*
- *Lab – Segmentation using private VLANs*

## Campus operations with CloudVision

### CloudVision overview

- Why CloudVision
- Approaches to network automation
- Introduction to CloudVision
- CVP implementation options

### CloudVision setup

- CVP clustering
- CVP Multi-node OVA installation
- CVaaS initial onboarding
- Upgrading CVP
- CVP backup and restore
- Getting familiar with CVP interface
- CVP profiles
- CVP help center
- License key management using CVP
- *Lab – Navigating CVP*

## CloudVision Provisioning

### Device registration

- Connecting devices to CloudVision
- Manual onboarding

### Network provisioning

- Containers
- Configuration sources
- Designed and running config
- Configlets
- Tasks and change control
- Applying configlets to containers
- Reconcile
- *Lab – Configlets*
- Snapshots and staging
- Redesigned change control UI
- Rollback
- *Lab – Snapshots*
- *Lab – Change Control*
- Image repository

### Zero touch provisioning

- Zero touch provisioning (ZTP)
- Deploying and onboarding vEOS to CVP using ZTP
- Zero Touch replacement (ZTR)
- Replacing a device using ZTR

## CloudVision Campus Studios

### Studios overview

- Introduction to Studios and Tags
- Workspaces
- Studio deployment and execution
- *Lab – Using Studios*
- *Lab – Clean up Studios*

### Studios in action

- New Studios UI
- Static configuring Studio
- Management connectivity Studio
- Software management Studio
- Authentication Studio
- Mirroring Studio
- Provisioning new devices with ZTP and Studios
- *Lab – Static configuration Studio*

### Operating L2LS Campus network with CVP Studios

- Onboarding devices to Studios
- Configure L2LS network using Studios
- Configure access interfaces
- Submit workspace and execute change control
- Managing L2LS campus gateway connectivity with Studios
- Add a new VLAN to L2LS campus
- Modifying VLAN settings in L2LS campus
- Connecting new host to L2LS campus
- *Lab – Deploying L2 Campus with Studios*

### Campus Zero Touch operations

- CloudVision Campus dashboard overview
- CloudVision Campus Day 1 – Onboarding
- CloudVision Campus Day 2 – Provisioning and Diagnostics
- CloudVision endpoint analyzer
- *Lab – Day 2 operations with L2 Campus Studios*

### Operating L3LS Campus network with CVP Studios

- Configuring L3LS Campus with CVP Studios
- Configuring L3LS Campus with VXLAN and EVPN using Studios
- Adding new access pods to L3LS Campus
- Adding new spines to L3LS Campus
- Adding new VRFs to L3LS Campus
- Add new VLANs to L3LS Campus
- Modifying VRF and VLAN settings for L3LS Campus
- Changing underlay protocol in L3LS Campus
- Connecting new hosts to L3LS Campus
- *Lab – Deploying L3LS Campus with VXLAN and EVPN using Studios*
- *Lab – Day 2 operations with L3 Campus Studios*

## Monitoring Campus with CVP

### Monitoring devices with CVP

- Network hierarchy
- Compliance overview
- Device input power
- 802.1x details in endpoint search
- *Lab – Monitoring Campus with network hierarchy*

### Dashboards

- Dashboards overview
- Dashboards enhancements
- Device connectivity health panel dashboard
- Compliance counts dashboard
- Syslog filters dashboard
- Dashboard tabs layout
- Exporting and importing dashboards

### Events

- Events overview
- Event groups
- Compliance events
- Config sanity check events
- *Lab – Dashboards and Events*

### Topology

- Introduction to topology
- Topology icons and settings
- Custom topology hierarchies
- User defined topology filters
- *Lab - Topology*

## EOS Operations upgrades

### EOS reloads and upgrades

- Understanding EOS upgrades
- Standard upgrade vs smart system upgrade
- Upgrading EOS with CLI
- Upgrading EOS with CVP
- MLAG ISSU upgrade and reload with CLI
- Chassis upgrade and reload
- MLAG upgrade and reload with CVP

### EOS monitoring tools

- SNMP
- sFlow
- Watch and Diff commands
- Latency Analyzer (LANZ)
- Port mirroring

## Advanced Event Management (AEM)

- AEM – CLI scheduler
- AEM – Event monitor
- AEM – Event manager
- *Lab - AEM*

## Troubleshooting EOS hardware and software

- System and software troubleshooting
- SFP and physical errors
- Arista EOS health checks – CLI and CVP
- Hardware troubleshooting
- Memory and flash errors
- Tcpdump and Iperf
- Installing extensions
- Recovery procedures

## Managing Wireless operations

### Introduction to CV-CUE

- Introducing CV-CUE

### CV-CUE operations overview

- CV-CUE features overview
- Wired and wireless monitoring
- Auto Wi-Fi threat detection and prevention
- Auto network assurance
- Auto issue locationing
- Auto client connectivity troubleshooting
- Auto client and network performance issue troubleshooting
- Auto Application troubleshooting
- Lab – Navigating CV-CUE*

### Device firmware update in CV-CUE

- Hitless AP upgrades

### CV-CUE AIOps

- Explore overview dashboard
- Analyze app experience using the overview dashboard
- Explore feed dashboard
- Perform operations with Cognitive maps
- Map view persona-based workflows
- Floor plan coverage and throughput SLA

### Wi-Fi visibility with CV-CUE

- Reactive and proactive troubleshooting
- Monitor Wi-Fi with CUE dashboard
- Monitor clients with CUE
- Monitor Access Points and RFs with CUE
- Monitor Wi-Fi with Cognitive maps and alerts
- Proactive Wi-Fi monitoring with client connectivity test
- Monitor Wi-Fi with Map views and feed
- View and Compare configuration checkpoints
- Lab – Monitoring wireless clients*
- Lab – Monitoring access points*

## Wi-Fi visibility with CloudVision

- Monitor devices with CloudVision campus health dashboard
- Telemetry between CVP and CV-CUE

## Troubleshoot Wi-Fi issues with CV-CUE

- Proactive network assurance
- Troubleshoot wrong PSK issue
- Troubleshoot RADIUS access reject issue
- Troubleshoot No DHCP IPv4 address issue
- Troubleshoot Low RSSI and low data rate issues
- Troubleshoot high retry rate issue
- Troubleshoot DNS failures IPv4 issue
- Troubleshoot Rogue AP issue
- Day in the life of CV-CUE network operator
- Lab – Client connectivity test*
- Lab – Troubleshoot Client connectivity issues*

## Headquarters

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