



SDN/NFV and SD-WAN Testing and Certification

- 5 Day Course
- Lecture and Hands-on Labs

Course Overview

Cloud networking has become code. Learn how to build a network from the ground up using open source software. You will learn the essential components that will allow you build, test, and troubleshoot any cloud network. Once you understand the fundamental networking components, you can eliminate vendor lock-in and deploy your own high performance, secure network, all from code. You develop the skills and knowledge needed to build a network from SD-LAN to SD-WAN by performing real hands on examples that just work.

Build, configure, and deploy the most popular SDN, NFV, and SD-WAN technologies to create networks, control routing and bridging, and secure applications. Integrate these components with external nets, even the internet, and perform verification testing.

Review this course online at <https://www.alta3.com/courses/sd-wan>

Who Should Attend

- Network and Cloud Engineers
- DevOps Professionals
- Managers and Directors (those in need of an overview of concepts)

What You'll Learn

- Build an SD-WAN from the ground up
- Performance Testing
- Cloud networking (KVM / QEMU)
- Docker Runtime Environment
- SDNs relationship to Service Mesh
- WireGuard
- SDN within the 5G network
- Linux network namespaces
- The “new” iproute2 commands
- TCPDump & Wireshark Captures and Analysis
- OpenFlow Protocol
- NETCONF / YANG
- OpenVSwitch and Linux Bridge
- OpenDaylight and Ryu controllers
- Mininet
- AI LLM prompt engineering for relevant configuration snippets and solutions

Outline

AI LLM Toolkit

-  Lecture + Lab: Large Language Model toolkit for AI Solution Assistance

Overview










-  Lecture + Lab: Introduction

Software Control Management

-  Lecture + Lab: SCM Option #1 - GitHub
-  Lecture + Lab: SCM Option #2 - GitLab

Network Function Virtualization Layer2 basics

-  Lecture + Lab: Network Namespace
-  Lecture + Lab: Modify bash to show network namespace
-  Lecture + Lab: Veth
-  Lecture + Lab: Troubleshooting slow networks
-  Lecture + Lab: Essential ip2 commands ##### Bridges
-  Lecture + Lab: Linux Bridge
-  Lecture + Lab: Bridge Management ##### Open vSwitch
-  Lecture + Lab: OvS Review - Lecture and study
-  Lecture + Lab: Open vSwitch (OVS) Bridge
-  Lecture + Lab: Open vSwitch Bridge Internal
-  Lecture + Lab: Open vSwitch Patch
-  Challenge: Build a Complete L2 NFV Network ##### Container Networking
-  Lecture + Lab: Networking Containers
-  Lecture + Lab: Networking K8s PODS ##### TCPDump And VLANs
-  Lecture + Lab: Using TCPdump to make pcap Files for Wireshark
-  Lecture + Lab: vlan
-  Lecture + Lab: Build and Manage DHCP
-  Lecture + Lab: vlan trunking ##### Network Function Virtualization Layer 3
-  Lecture + Lab: IP Forwarding Analysis and Troubleshooting
-  Lecture + Lab: NFV Router
-  Lecture + Lab: iptables
-  Lecture + Lab: NFV NAT Function
-  Lecture + Lab: NFV NAT Port Forwarding
-  Lecture + Lab: Persisting IPTables Configuration
-  Challenge: L3 Challenge - Build an L3 NFV network ##### SDN Switch
-  Lecture + Lab: SDN Introduction
-  Lecture + Lab: Introduction to Using Wireshark
-  Lecture + Lab: Introduction to Mininet
-  Lecture + Lab: Mininet vs. NFV The Hard Way
-  Lecture + Lab: ADVANCED - Mininet and Linux Network Namespaces ##### SDN Controller
-  Lecture + Lab: OpenFlow Protocol
-  Lecture + Lab: SDN Topology Analysis using Python
-  Lecture + Lab: Using Wireshark to capture OpenFlow v1.3 Traffic
-  Lecture + Lab: Introducing the Controllers - Ryu
-  Lecture + Lab: Writing a Flowmod to handle a Table-Miss Controller Application ryu-app
-  Lecture + Lab: Deploying Simple Switch Logic with an SDN - Ryu
-  Lecture + Lab: Deploying Simple Switch Logic with an SDN - Ryu part 2
-  Lecture + Lab: Faucet and Open vSwitch
-  Lecture + Lab: Faucet and ACLs
-  Lecture + Lab: Faucet and VLANs
-  Lecture + Lab: Faucet and Practical NFV Services ##### Real World SDN examples
-  Lecture + Lab: 5G is 100% SDN!
-  Lecture + Lab: OpenDaylight
-  Lecture + Lab: OVN ##### Hardware Acceleration

-  Lecture + Lab: SR-IOV Essentials ##### NETCONF/YANG
-  Lecture + Lab: NETCONF/YANG Lecture ##### Networking KVM
-  Lecture + Lab: Networking KVM Based VMs
-  Lecture + Lab: QEMU Networking Primitives ##### Build an SD-WAN by combining everything we have learned
-  Lecture + Lab: Wireguard VPN
-  Lecture + Lab: Wireguard VPN with network namespace termination
-  Lecture + Lab: NFV & SDN - Certification Project (OPTIONAL - Three Location SD-WAN) ##### Real World KVM examples
-  Lecture + Lab: OpenStack ##### SDN Security Best Practices
-  Lecture + Lab: Securing SDN Best Practices

Next Courses

- 5G Essentials (<https://alta3.com/courses/5g>)
- Kubernetes - Certified Kubernetes Administration (CKA) (<https://alta3.com/courses/cka>)