ALTA3 RESEARCH

SDN

- 5 Day Course
- Lecture and Hands-on Labs

Course Overview

Software Defined Networking (SDN) and Network Function Virtualization (NFV) are necessary advancements of the networking control paradigm, driven by the rise of cloud architectures (such as OpenStack and Kubernetes). Beyond integration within cloud technologies, you will discover how SDN and NFV are evolving traditional MPLS networks, driving the evolution of 5G, and making IoT network security and management possible.

Build, configure, and deploy the most popular SDN and NFV technologies to create networks, control routing and bridging, and secure applications. Integrate these components with an emulated physical environment and perform verification testing.

Review this course online at https://www.alta3.com/courses/sdn

Who Should Attend

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

What You'll Learn

- Cloud networking (KVM / QEMU)
- Docker Runtime Environment
- SDNs relationship to Service Mesh
- SD-WAN
- 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

- Lecture + Lab: Register for Poll #### Linux Networking Basics
- Lecture + Lab: OPTIONAL - Using vim

- Lecture + Lab: Meet VIRGIL: Your AI Lab Coach
- Lecture + Lab: Linux Networking Basics

AI Lab Assistance

Software Control Management

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

NFV

- Lecture + Lab: Using TCPdump to make pcap Files for Wireshark
- Lecture + Lab: Virtual Interfaces
- Lecture + Lab: Linux Bridge
- Lecture + Lab: ADVANCED - Augmenting bash for working with Network Namespaces #### SDN Switch
- Lecture + Lab: Open vSwitch (OVS)
- Lecture + Lab: Introduction to Using Wireshark
- Lecture + Lab: Introduction to Mininet
- Lecture + Lab: Mininet vs NFV The Hard Way
- Lecture + Lab: Mininet and Linux Network Namespaces #### SDN Controller
- Lecture + Lab: ADVANCED - 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 #### Wiring the Cloud
- Lecture + Lab: SDN with KVM
- Lecture + Lab: NFV within the Docker Container Runtime Environment
- Lecture + Lab: Representational State Transfer (REST) APIs