



## SDN Associate

### Module 1: Networking Concepts

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- Ethernet networks
- Collision domains and broadcast domains
- Function of routers and switches
- Routing Protocols (RIP, OSPF, ISIS, BGP)
- Optical network fundamentals – SONET/SDH, OTN
- IP Network Services ( DHCP, DNS, ARP, NAT, ICMP)
- Layer 2 addressing, including address resolution
- IPv4 and IPv6 fundamentals
- Layer 3 / IP addressing, including subnet masks
- Longest match routing
- Connection-oriented vs. connectionless protocols
- Packet Filtering with Match/Action Pairs

### Module 2: Introduction

- Evolution of networking.
- Drawbacks of current networking model
- Technical and commercial factors driving growth towards SDN.
- Motivation towards SDN.
- Definition of SDN.
- Control and data plane terminology.
- Use cases of SDN.
- Early adopters- Google B4 project, Facebook.

### Module 3: Virtualization and Hypervisors

- Introduction to Virtualization and Hypervisors.
- Use cases of Virtualization in IT- use cases.
- Type of Hypervisors- qemu, KVM, Virtual box, etc.
- Demo to understand virtualization and hypervisors on your machines.
- Introduction to Linux bridging and hands-on demo.

### Module 4: Openflow

- Deep dive in SDN- What is Openflow.
- Introduction to NFV.
- Openflow architecture
- Openflow protocol
- Proactive vs reactive flows
- Match Types
- Match Actions
- Setting up a flow
- Flow entry format
- Openflow message structure
- SDN and Openflow use cases.

### Module 5: Building Blocks

- SDN building blocks in detail
- How is control plane is defined and controlled.
- How is data plane defined and controlled.
- Overview of controllers- OpenDaylight, Floodlight, RYU, POX, NOX, Contrail.
- Open Source tools- Mininet and Wireshark hands-on demo.
- Introduction to open source routers- Quagga and Vyos.

### Module 6: SDN Interfaces

- SDN Interfaces- North-Bound and South-bound.
- South-bound interfaces introduction- Openflow, OVSDB, NetConf and YANG.
- Northbound interfaces introduction- REST, RESTful and RESTCONF.
- Imperative vs Declarative SDN
- SDN Deployment- Intent based deployment or Application Driven Network.
- Centrally distributed or Hybrid networks.
- Understanding of Floodlight Controller- practical hands-on demo.

### Module 7: Further Reading

- SDN performance, high availability and security considerations.
- Introduction to SD-WAN.

