

## دوره CCNP + SD-WAN

این دوره ترکیب دوره‌های CCNP و SD-WAN می‌باشد.

سرفصل‌ها

### CCNP :

#### Outline - CCNP ENCOR

- Examining Cisco Enterprise Network Architecture
- Understanding Cisco Switching Paths
- Implementing Campus LAN Connectivity
- Building Redundant Switched Topology
- Implementing Layer ۲ Port Aggregation
- Understanding EIGRP
- Implementing OSPF
- Optimizing OSPF
- Exploring EBGp
- Implementing Network Redundancy
- Implementing NAT
- Introducing Virtualization Protocols and Techniques
- Understanding Virtual Private Networks and Interfaces
- Understanding Wireless Principles
- Examining Wireless Deployment Options
- Understanding Wireless Roaming and Location Services
- Examining Wireless AP Operation



- Understanding Wireless Client Authentication
- Troubleshooting Wireless Client Connectivity
- Introducing Multicast Protocols
- Introducing QoS
- Implementing Network Services
- Using Network Analysis Tools
- Implementing Infrastructure Security
- Implementing Secure Access Control
- Understanding Enterprise Network Security Architecture
- Exploring Automation and Assurance Using Cisco DNA Center
- Examining the Cisco SD-Access Solution
- Understanding the Working Principles of the Cisco SD-WAN Solution
- Understanding the Basics of Python Programming
- Introducing Network Programmability Protocols
- Introducing APIs in Cisco DNA Center and vManage

## Lab outline

- Investigate the CAM
- Analyze Cisco Express Forwarding
- Troubleshoot VLAN and Trunk Issues
- Tuning Spanning Tree Protocol (STP) and Configuring Rapid Spanning Tree Protocol (RSTP)
- Configure Multiple Spanning Tree Protocol
- Troubleshoot EtherChannel
- Implement Multi-area OSPF
- Implement OSPF Tuning



- Apply OSPF Optimization
- Implement OSPFv3
- Configure and Verify Single-Homed EBGP
- Implementing Hot Standby Routing Protocol (HSRP)
- Configure Virtual Router Redundancy Protocol (VRRP)
- Implement NAT
- Configure and Verify Virtual Routing and Forwarding (VRF)
- Configure and Verify a Generic Routing Encapsulation (GRE) Tunnel
- Configure Static Virtual Tunnel Interface (VTI) Point-to-Point Tunnels
- Configure Wireless Client Authentication in a Centralized Deployment
- Troubleshoot Wireless Client Connectivity Issues
- Configure Syslog
- Configure and Verify Flexible NetFlow
- Configuring Cisco IOS Embedded Event Manager (EEM)
- Troubleshoot Connectivity and Analyze Traffic with Ping, Traceroute, and Debug
- Configure and Verify Cisco IP SLAs
- Configure Standard and Extended ACLs
- Configure Control Plane Policing
- Implement Local and Server-Based AAA
- Writing and Troubleshooting Python Scripts
- Explore JavaScript Object Notation (JSON) Objects and Scripts in Python
- Use NETCONF Via SSH
- Use RESTCONF with Cisco IOS XE Software

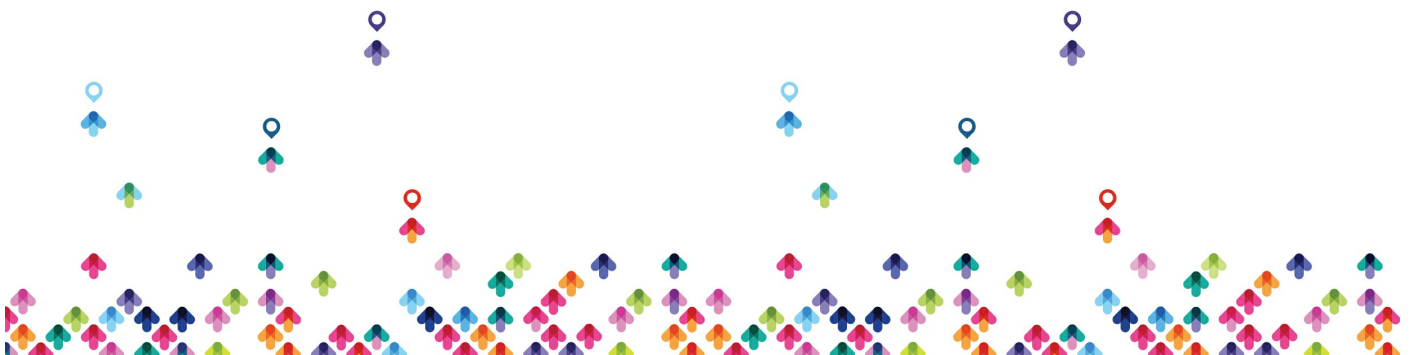
## Outline - CCNP ENARSI



- Implementing EIGRP
- Optimizing EIGRP
- Troubleshooting EIGRP
- Implementing OSPF
- Optimizing OSPF
- Troubleshooting OSPF
- Implementing Internal Border Gateway Protocol (IBGP)
- Optimizing BGP
- Implementing MP-BGP
- Troubleshooting BGP
- Configuring Redistribution
- Troubleshooting Redistribution
- Implementing Path Control
- Exploring MPLS
- Introducing MPLS L<sub>۳</sub> VPN Architecture
- Introducing MPLS L<sub>۳</sub> VPN Routing
- Configuring Virtual Routing and Forwarding (VRF)-Lite
- Implementing DMVPN
- Implementing DHCP
- Troubleshooting DHCP
- Introducing IPv<sub>۶</sub> First Hop Security
- Securing Cisco Routers
- Troubleshooting Infrastructure Security and Services

## Lab Outline

- Configure EIGRP Using Classic Mode and Named Mode for IPv<sub>۴</sub> and IPv<sub>۶</sub>



- Verify the EIGRP Topology Table
- Configure EIGRP Stub Routing, Summarization, and Default Routing
- Configure EIGRP Load Balancing and Authentication
- LAB: Troubleshoot EIGRP Issues
- Configure OSPFv۳ for IPv۴ and IPv۶
- Verify the Link-State Database
- Configure OSPF Stub Areas and Summarization
- Configure OSPF Authentication
- Troubleshoot OSPF
- Implement Routing Protocol Redistribution
- Manipulate Redistribution
- Manipulate Redistribution Using Route Maps
- Troubleshoot Redistribution Issues
- Implement PBR
- Configure IBGP and External Border Gateway Protocol (EBGP)
- Implement BGP Path Selection
- Configure BGP Advanced Features
- Configure BGP Route Reflectors
- Configure MP-BGP for IPv۴ and IPv۶
- Troubleshoot BGP Issues
- Implement PBR
- Configure Routing with VRF-Lite
- Implement Cisco IOS DMVPN
- Obtain IPv۶ Addresses Dynamically
- Troubleshoot DHCPv۴ and DHCPv۶ Issues
- Troubleshoot IPv۴ and IPv۶ Access Control List (ACL) Issues



- Configure and Verify Control Plane Policing
- Configure and Verify Unicast Reverse Path Forwarding (uRPF)
- Troubleshoot Network Management Protocol Issues: Lab ۱
- Troubleshoot Network Management Protocol Issues: Lab ۲

## SD-WAN :

این دوره به شش دسته کلی و چندین زیرشاخه در سرفصلها تقسیم می‌شود که جزئیات آن در زیر قابل مشاهده است:

### Cisco Catalyst SDWAN بخش اول: معماری و زیرساخت شبکه

- Cisco SD-WAN architecture and components
- Orchestration plane (vBond, NAT)
- Management plane (vManage)
- Control plane (vSmart, OMP)
- TLOC, vRoute
- Data plane (WAN Edge), IPsec and GRE
- BFD
- Multi-Region Fabric
- Cisco Catalyst SD-WAN Edge platforms (Hardware and Software) and capabilities
- Cloud-on-Ramp

بخش دوم: کنترلرها: معرفی و پیاده‌سازی معماری

- Controller is everything!
- Controller cloud deployment
- Controller on-premises deployment



- Hosting platforms (Public and Private)
- Installing controllers
- Scalability and redundancy
- Configure certificates and on-boarding
- Troubleshoot control plane connectivity

بخش سوم: پیاده‌سازی معماری گسترده بر روی روترها

- WAN Edge deployment
  - On-boarding (ZTP and Bootstrap)
  - Data center and regional hub deployments
- Configure Cisco SD-WAN data plane  
Circuit termination and TLOC-extension
  - Dynamic tunnels
  - Underlay-overlay connectivity
- Configure OMP
- Configure TLOCs
- Configure CLI and vManage feature configuration templates
  - VRRP
  - OSPF
  - BGP
  - EIGRP
- Multicast support in Cisco SD-WAN



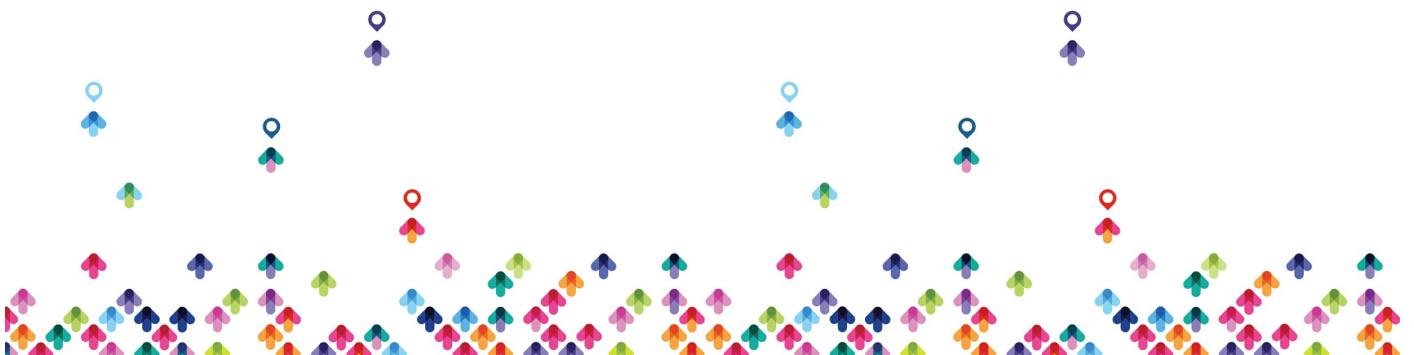
- Configuration groups, feature profiles, and workflows

بخش چهارم: پالیسی‌ها

- Configure control policies
- Configure data policies
- Configure end-to-end segmentation
  - VPN segmentation
  - Topologies
- Configure Cisco SD-WAN application-aware routing
- Configure direct Internet access

بخش پنجم: امنیت و مدیریت سرویس‌ها

- Configure service insertion
- Cisco SD-WAN security features
  - ۵.۲.a. Application-aware enterprise firewall
  - IPS
  - URL filtering
  - AMP
  - SSL and TLS proxy
  - TrustSec
- Cloud security integration
  - DNS security
  - Secure Internet Gateway (SIG)





- Configure QoS treatment on WAN Edge routers
  - Scheduling
  - Queuing
  - Shaping
  - Policing
  - Marking
  - Per-tunnel and adaptive QoS
- Application Quality of Experience (App-QoE)
  - TCP optimization
  - Data Redundancy elimination (DRE)
  - Packet duplication
  - Forward error correction (FEC)
  - AppNav

بخش ششم: مدیریت و بهره‌برداری

- Authentication, monitoring, and reporting from vManage
- Configure authentication, monitoring, and reporting
- REST API monitoring
- Software image management from vManage

ها دسترسی Workbook این دوره به دو بخش مفاهیم و لابراتوار تقسیم می‌شود که کلیه دانشجویان به تمامی لابراتوارها و خواهند داشت.

مخاطبان دوره



- مدیران زیرساخت شبکه
- مشاورین شبکه
- مدیران فناوری اطلاعات
- طراحان معماری شبکه

## پیش نیازها

آشنایی با تکنولوژی‌های Enterprise سیستم‌ها

