BLACKBIRD FOR TRAINING

# CCNP Routing and Switching

1 – 12 November 2027
Orlando, Florida (USA)

UK Traininig
PARTNER



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# CCNP Routing and Switching

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## Introduction

The CCNP Routing and Switching: Modern Advanced Concepts and Practices course is designed to provide participants with an in-depth and current understanding of advanced routing and switching concepts. This comprehensive CCNP course is ideal for networking professionals seeking to enhance their skills and obtain CCNP certification. By mastering the latest technologies and best practices in routing and switching, participants will be equipped with the knowledge necessary to design, implement, and troubleshoot complex enterprise networks. Whether aiming for CCNP routing and switching certification or simply seeking to improve their professional expertise, this course is a vital step toward career advancement in the networking field.

## Course Objectives

The course will enable you to:

- Develop a deep understanding of advanced routing protocols, including OSPFv3, EIGRPv6, and BGP, and their application in modern networks.
- Explore advanced switching concepts, such as VLANs, Rapid Spanning Tree Protocol RSTP, and Software-Defined Networking SDN.
- Acquire expertise in network design principles and best practices for modern enterprise networks, including network segmentation and scalability.
- Master advanced troubleshooting techniques for routing and switching issues in complex network environments.
- Stay up to date with emerging technologies and trends in network automation, programmability, and security.

## Course Outlines

### Day 1: Advanced Routing Protocols

- Introduction to advanced routing protocols in modern networks.
- OSPFv3: Configuration and optimization in IPv6 environments.
- EIGRPv6: Configuration and optimization for IPv6 networks.
- BGP: Concepts, configuration, and best practices.
- Route redistribution and filtering in multi-protocol networks.



## Day 2: Advanced Switching Concepts

- Advanced VLAN concepts and configuration in modern networks.
- Optimization of RSTP and MSTP.
- Virtual Switching System VSS and Virtual Port Channels vPC for enhanced network scalability and redundancy.
- Principles and applications of Software-Defined Networking SDN.
- Network Function Virtualization NFV and network programmability.

## Day 3: Network Design and Scalability

- Principles of enterprise network design for modern networks.
- Techniques for network segmentation and virtualization.
- Scalability considerations for enterprise networks.
- Designing for high availability and redundancy in complex network architectures.
- Implementing Quality of Service QoS for optimized network performance.

## Day 4: Advanced Troubleshooting Techniques

- Advanced troubleshooting methodologies for routing and switching issues.
- Troubleshooting complex network connectivity problems.
- Troubleshooting performance issues and network optimization.
- Network monitoring and analysis tools for troubleshooting.
- Real-world case studies and hands-on troubleshooting scenarios.

## Day 5: Network Automation and Programmability

- Introduction to network automation and programmability.
- Network automation tools and frameworks e.g., Ansible, Python scripting.
- Network Configuration Management and Orchestration.
- Introduction to SDN controllers and programmable network devices.
- Application Programming Interfaces APIs for network automation and integration.

## Day 6: Network Security and Threat Mitigation

- Advanced network security concepts and best practices.
- Access Control Lists ACLs, Firewalls, and Intrusion Prevention Systems IPS.
- Threat mitigation techniques, including Network Address Translation NAT and Denial of Service DoS protection.
- Secure network design principles and defense-in-depth strategies.
- Network security monitoring and incident response.



## Day 7: Network Virtualization and Cloud Technologies

- Virtualization technologies for network environments e.g., Virtual Routing and Forwarding VRF, Virtual Extensible LAN VXLAN.
- Concepts and architectures of Software-Defined Data Center SDDC.
- Network overlays and tunneling technologies e.g., VXLAN, Generic Routing Encapsulation GRE.
- Principles and best practices of cloud networking e.g., Cloud Service Models, Cloud Connectivity Options.

## Day 8: Network Services and Infrastructure

- DNS Domain Name System architecture and implementation.
- Design and deployment of DHCP Dynamic Host Configuration Protocol.
- Importance of Network Time Protocol NTP in network synchronization.
- Network Monitoring and Management protocols e.g., SNMP, NetFlow, Syslog.
- Optimization of network infrastructure and capacity planning.

## Day 9: Emerging Technologies and Trends

- Introduction to emerging network technologies and trends.
- Network automation frameworks and tools e.g., DevOps, Infrastructure as Code - IaC.
- Network analytics and intent-based networking.
- Impact of the Internet of Things IoT on network infrastructure.
- Next-generation network architectures and technologies e.g., SD-WAN, Intent-Based Networking.

## Day 10: Network Design Project

- Collaborative network design project incorporating advanced routing and switching concepts.
- Validation and optimization of the network design.
- Presentation of network design project outcomes.
- Q&A session and course wrap-up.



## Why Attend This Course: Wins & Losses!

- CCNP Certification: This course prepares you for obtaining the highly sought-after CCNP routing and switching certification. By mastering advanced routing and switching protocols, you will be qualified for many network engineering roles.
- Comprehensive Knowledge: Gain deep insights into key network technologies like SDN, NFV, network security, and cloud networking, ensuring you are prepared for the most complex network environments.
- Hands-On Experience: The course incorporates real-world case studies and troubleshooting scenarios, ensuring you gain practical experience that can be applied immediately in your work.
- Emerging Technologies: Stay ahead of industry trends and gain exposure to the latest in network automation, network programmability, and SD-WAN, which are crucial for modern networking infrastructures.
- Career Advancement: With CCNP certification, you will increase your career prospects, as more employers seek certified professionals to handle advanced networking tasks and systems.

## Conclusion

The CCNP Routing and Switching course provides an unparalleled opportunity for networking professionals to advance their skills and become CCNP certified. With an emphasis on advanced routing protocols, switching concepts, and network security, this course equips participants to design, implement, and troubleshoot modern enterprise networks effectively.

Whether you are aiming for a CCNP certification, or simply wish to improve your routing and switching expertise, this course ensures that you will be well-prepared to tackle the challenges of today's evolving networking landscape.

**This course is an essential step toward networking excellence in the ever-changing world of enterprise network design, making it an ideal choice for professionals who want to stay ahead in the networking industry.**

