CCNP Routing and Switching

Kuala Lumpur (Malaysia)

14 - 25 April 2025

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CCNP Routing and Switching

Introduction

The CCNP Routing and Switching: Modern Advanced Concepts and Practices course is designed to provide participants with a comprehensive and up-to-date understanding of advanced concepts and practices in routing and switching. This extensive course aims to enhance your knowledge and skills necessary to effectively design, implement, and troubleshoot complex enterprise networks using the latest technologies and best practices. It is essential for any professional seeking to obtain CCNP certification and aims to improve competencies in routing and switching.

Course Objectives

- 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.
- Learn about 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 in modern networks.
- 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.

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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.

Conclusion

The CCNP Routing and Switching course offers a fantastic opportunity for networking professionals to expand their skill set and achieve CCNP certification. By understanding advanced routing protocols and switching concepts, as well as applying network security and future trends, this course prepares participants to design and manage modern enterprise networks effectively.

It is an essential step toward professional excellence in the ever-evolving world of networking.

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