

PM Networking

CCNA 200-301

syllabus with real-time use cases



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CCNA 200-301 syllabus with real-time use cases for each topic. This will help you understand how these concepts are applied in production networks.

1. Network Fundamentals

- Real-Time Use Case: Setting up a new branch office network with proper addressing and cabling.

- Topics:

- IP addressing and subnetting
- IPv4 and IPv6
- Ethernet and switch operations
- Cabling and interface types
- TCP/IP model and protocols

2. Network Access

- Real-Time Use Case: Implementing VLANs to segment network traffic for different departments.

- Topics:

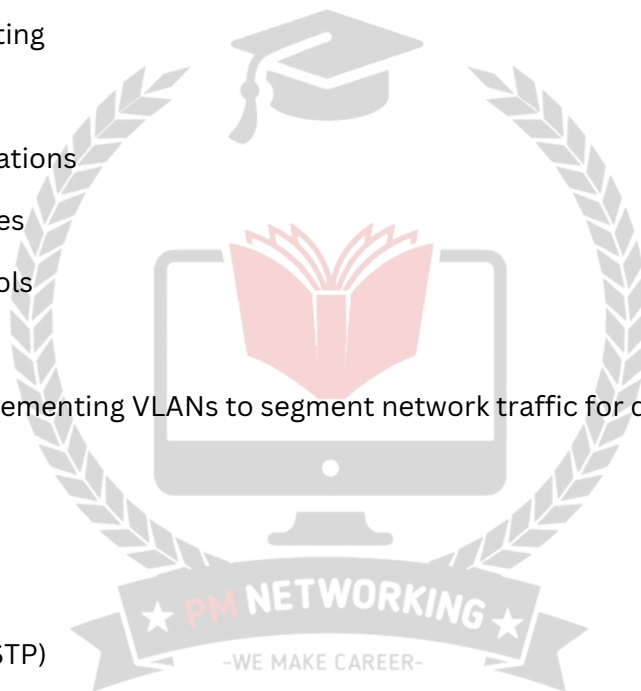
- VLANs
- Trunking
- Spanning Tree Protocol (STP)
- Wireless LANs

3. IP Connectivity

- Real-Time Use Case: Configuring routers to ensure communication between different network segments.

- Topics:

- Routing protocols (OSPF, EIGRP)
- Inter-VLAN routing
- Static and dynamic routing
- Default gateway configuration



4. IP Services

- Real-Time Use Case: Providing DHCP and DNS services to devices on the network.
- Topics:
 - DHCP
 - DNS
 - Network Time Protocol (NTP)
 - Simple Network Management Protocol (SNMP)
 - Quality of Service (QoS)
 - Network Address Translation (NAT)
 - Port Address Translation (PAT)

5. Security Fundamentals

- Real-Time Use Case: Implementing firewall rules and access control lists (ACLs) to secure the network.
- Topics:
 - Threat analysis and security vulnerabilities
 - Secure network devices
 - Secure access to the console and VTY lines
 - Secure network protocols (SSH, HTTPS)
 - ACLs and firewalls
 - VPNs

6. Automation and Programmability

- Real-Time Use Case: Using Python scripts to automate network configuration tasks.
- Topics:
 - Automation concepts
 - Network programmability
 - APIs and controllers
 - Introduction to Python scripting



7. Network Troubleshooting

- **Real-Time Use Case: Diagnosing and resolving network issues in a production environment.**

- Topics:

- Troubleshooting methodologies
- Tools and commands (ping, traceroute, show commands)
- Troubleshooting connectivity issues
- Troubleshooting VLANs and trunking
- Troubleshooting routing protocols

8. Network Device Management

- **Real-Time Use Case: Monitoring network performance and maintaining network devices.**

- Topics:

- Network management protocols (SNMP)
- Syslog
- Device monitoring and logging
- Device maintenance and firmware updates

Detailed Sequence and Lab Exercises:

1. Network Fundamentals

- Lab: Basic IP addressing and subnetting
- Lab: Setting up a simple network with switches and routers

2. Network Access

- Lab: Configuring VLANs and trunking on switches
- Lab: Implementing STP for network redundancy
- Lab: Setting up a basic wireless network

3. IP Connectivity

- Lab: Configuring static and dynamic routing (OSPF)
- Lab: Inter-VLAN routing using a router or Layer 3 switch



4. IP Services

- Lab: Setting up DHCP on a router
- Lab: Configuring DNS services
- Lab: Implementing NAT and PAT

5. Security Fundamentals

- Lab: Configuring ACLs on routers
- Lab: Securing router access with SSH
- Lab: Basic firewall configuration

6. Automation and Programmability

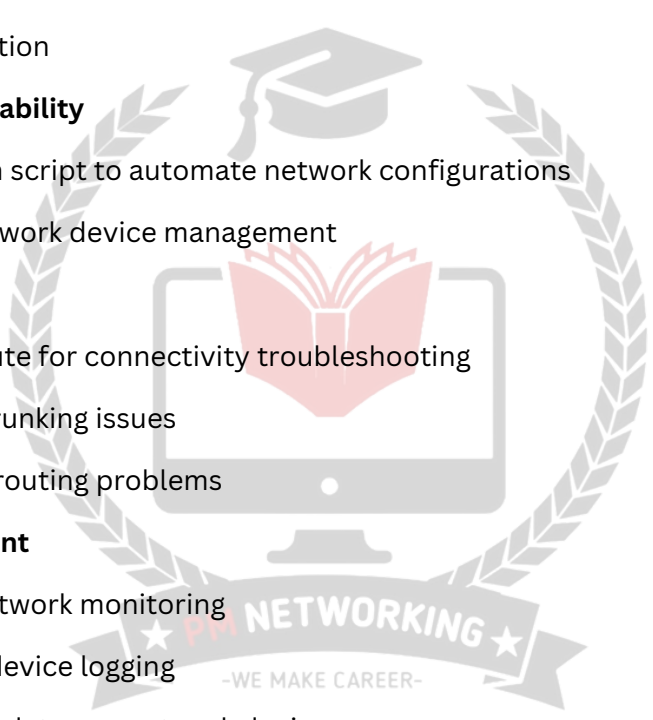
- Lab: Writing a simple Python script to automate network configurations
- Lab: Using REST APIs for network device management

7. Network Troubleshooting

- Lab: Using ping and traceroute for connectivity troubleshooting
- Lab: Diagnosing VLAN and trunking issues
- Lab: Troubleshooting OSPF routing problems

8. Network Device Management

- Lab: Setting up SNMP for network monitoring
- Lab: Configuring syslog for device logging
- Lab: Performing firmware updates on network devices



Real-Time Use Case Summary:

In a production network, these concepts and skills are used to design, implement, secure, and troubleshoot networks. Network engineers routinely segment networks with VLANs, configure routing protocols for efficient data flow, secure the network with ACLs and firewalls, automate repetitive tasks, and maintain the health and performance of network devices.

By practicing these labs and understanding their real-world applications, you'll be well-prepared for both the CCNA 200-301 exam and practical network engineering tasks.

