Learn the major components of a network and how service provider networks function.

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In this course, you will cover the fundamentals of networking as it relates to service providers (SPs). You will learn how networks and network components function, and you'll learn about major network components and the OSI reference model. If you are interested in attaining a CCNA Service Provider certification, you should also complete SPNGN2.

What You'll Learn

- Use the host-to-host packet delivery process
- Issues that are related to increasing traffic on an Ethernet LAN
- Switched LAN technology solutions to Ethernet networking issues
- Reasons for extending the reach of a LAN and the methods that can be used
- Reasons for connecting networks with routers and how routed networks transmit data by using TCP/IP
- Function of WANs and the major devices of WANs
- Configure PPP encapsulation, static and dynamic routing, and NAT
- Tools used to manage a service provider network

Who Needs to Attend

- Cisco Build-Operate-Transfer partners who are focused on service provider
NGN networks specific to entry-level network operations personnel
• Service provider network operations organizations specific to entry-level network operations personnel
• Service provider operations customers, partners who support service provider NGN environments, and internal Cisco engineers who wish to pursue Cisco professional or expert-level SP operations certifications

Prerequisites
• Familiarity with binary
• Familiarity with IP subnetting
• Basic knowledge of the OSI model
• Basic idea of the operation of TCP/IP
• Basic knowledge of Ethernet
• Basic knowledge of WAN
Virtual Classroom Live Outline

1. IP Fundamentals
   - Functions of Networking
     - Network Definition
     - Network Utilization
     - Characteristics of a Network
   - TCP/IP Layers and the OSI
     - Reference Model
     - Encapsulation
     - Layer 2 and Layer 3 Addresses
     - Host-to-Host Communication
   - IP Addressing Overview
     - Types of Addresses
     - IPv4 and IPv6 Headers
     - Assigning Addresses in IPv6
     - Internet Control Message Protocol
     - Verifying the IP Address of a Host
     - Domain Name System
   - IP Addressing and Subnets
     - Subnets
     - Default Gateways
     - IP Address Plan
   - TCP/IP Transport Layer
     - TCP and UDP Headers
     - TCP Connection Establishment
     - TCP Connection Teardown
2. Basic LAN Switching

- Ethernet
  - LAN
  - History of Ethernet
  - MAC Address
- Connecting to an Ethernet LAN
  - Ethernet on Layer 1
  - Copper Ethernet
  - Ethernet Fiber Connection
- Using Switched LAN Technology
  - Ethernet Limitations
  - Hubs and Collisions
  - Switches and Bridges
  - Modern Switched Network
- Operating a Cisco Switch
  - Cisco IOS Software Features
  - Cisco IOS Command Line
  - Cisco IOS Configuration
  - Startup Process
  - Basic Configuration
- Performing Switched Network Optimizations
  - Port Settings
  - Network Redundancy and Loops
  - Spanning Tree Protocol
  - EtherChannel
  - Flex Link
- Troubleshooting Switch Issues
  - Layered Troubleshooting
  - Media Issues
  - Port Issues
  - Configuration Issues

3. Basic IP Routing

- Functions of Routing
  - Router Basics
  - Routing Table and Routing Decision
  - Building a Routing Table
- Introduction to Cisco IOS XR
  - Classes of Cisco Routers
  - Cisco IOS XR Command-Line
  - Cisco IOS XR Configuration
- Configuring Basic Routing
  - Static Route Configuration
  - Routing Protocols
• Routing Information Protocol
  • Configuring Routing Protocols
    • Configuring EIGRP
      • EIGRP
      • EIGRP Configuration
      • EIGRP Load Balancing
      • EIGRP Authentication
      • IPv6 Support in EIGRP

4. Connectivity Technologies
• Access Technologies
  • WANs
  • WAN Hardware
  • WAN Encapsulation
  • Carrier Ethernet
• Service Provider Access, Edge, and Transport Technologies
• Enabling the WAN Internet Connection
  • Internet Access Basics
  • NAT Basics
  • Static NAT
  • Dynamic NAT and PAT
  • Acquiring Addresses with DHCP
• Encapsulation
  • WAN Encapsulation
  • PPP Encapsulation
  • POS Encapsulation
• VPN
  • Layer 2 Tunneling Protocol
  • IP Security Virtual Private Network
  • Generic Routing Encapsulation

5. Network Management and Security
• Collecting Device Data
  • Cisco Discovery Protocol
  • Simple Network Management Protocol
  • Syslog
  • NetFlow
• Configuring Network Management Tools
  • Configuring SPAN
  • IP Service Level Agreement
  • Network Time Protocol
  • Smart Call Home
  • Opening a TAC Request
• Network Security
  • History
  • Implementation of Network Protection
- Attacking a Network
- Switch Security
- Securing Administrative Access
- Cisco Router Security
- Accessing Remote Devices
- Restricting Access to the Switched Network Using AAA
  - AAA
  - Implementing Authentication Using the Local Database
  - Implementing Authentication Using a Remote Authentication Server

Virtual Classroom Live Labs
Lab 1: Verify Host IP Configuration
Lab 2: Define IP Subnets
Lab 3: Configure Cisco Switches
Lab 4: Configure Basic Router Configuration
Lab 5: Implement Internet Connectivity
Lab 6: Configure Data Link Layer Encapsulation
Lab 7: Configure Network Management Tools
Lab 8: Secure Network Devices
Lab 9: Configure AAA

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PRIVATE GROUP TRAINING 5 days

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