# Cisco Interconnecting Cisco Networking Devices Part 2



**Meet the expert:** As a certified Microsoft Instructor, Ken has focused his career on various security aspects of computer and network technology since the early 1980s. He has offered a wide variety of IT training and high level consulting projects for Fortune 500 companies globally. Through the course of his extensive career, he has taught a full line of Microsoft, CompTIA, Cisco, and other high level IT Security curricula.

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**Course description:** The Interconnecting Cisco Networking Devices Part 2 (ICND2) is the exam associated with the Cisco Certified Network Associate certification. Candidates can prepare for this exam by taking the Interconnecting Cisco Networking Devices Part 2 (ICND2) course. This exam tests a candidate's knowledge and skills required to successfully install, operate, and troubleshoot a small branch office network. The exam covers topics on extending switched networks with VLANs; VLSM and IPv6 addressing; the VTP, RSTP, OSPF and EIGRP protocols; determining IP routes; configuring, verifying and troubleshooting VLANs; managing IP traffic with access lists; NAT and DHCP; establishing point-to-point connections and establishing Frame Relay connections.

**Course outline:**

**Troubleshoot VLAN Connectivity**
- Introduction
- Overview of VLANs
- How to create a VLAN
- How to create a VLAN Continued
- What Is a Trunk
- How to Configure a Trunk
- How to Configure a Trunk Continued
- DTP
- VLAN Troubleshooting
- Destination MAC Addresses and VLANs
- VLAN Troubleshooting Continued
- Troubleshooting Trunks
- Troubleshooting Trunks Continued
- Summary
- Summary

**Building Redundant Switched Topologies**
- Introduction
- Problems with Redundant Topologies
- How Spanning-Tree Works
- How Spanning-Tree Works Continued
- STP Problems
- PVST+
- PVST+ Continued
- Changing the Bridge ID
- Reviewing the STP Topology
- Reviewing the STP Topology Continued
- What if STP Fails Continued
- What if STP Fails?
- PortFast and BPDU Guard
- PortFast and BPDU Guard Continued
- Summary
- Summary

**Improve Redundant Switched Topologies**
- Introduction
- What Is EtherChannel
- EtherChannel Protocols
- EtherChannel Protocols Continued
- PAgP
- LACP
- How to Configue EtherChannel
- How to Configure EtherChannel Continued
- Verify EtherChannel
- Verify EtherChannel Continued
- Summary
- Summary

**Spanning Tree and Trunking Demo**
- Introduction
- Demo: Spanning Tree
- Demo: show span
- Demo: Influencing Traffic
- Demo: Portfast
- Demo: EtherChannel
- Demo: Add Port Channels
- Layer 3 Redundancy
- Demo: Trunking
- Demo: VTP
- Demo: VTP Continued
- Summary

**Understanding Layer 3 Redundancy**
- Introduction
- Why Have Default Gateway Redundancy
- Default Gateway Redundancy
- Default Gateway Redundancy Continued
- FHRP
- HSRP
- HSRP Continued
- HSRP Failover
- HSRP Configuration
- The HSRP Protocol
- Show Standby
- Active and Standby Routers
- HSRP Track Interface
- HSRP Load Balancing
- Gateway Load Balancing Protocol
- QoS
- QoS Continued
- QoS Configuration
- QoS Options
- Marking
- Queuing Methods
- Congestion Avoidance
- Summary
- Summary

**Troubleshoot IPv4 Connectivity**
- Introduction
- Troubleshooting End-to-End
- Troubleshooting End-to-End Continued
- Verify End-to-End Connectivity
- Verify End-to-End Connectivity Continued
- Ping
- Traceroute
- Ping and Traceroute on Switches
- Telnet
- PC Host-Based ARP
- Show MAC Address Table
- End-to-End Connectivity
- Path Verification
- Speed Mismatch
- Using Show Interface
- What Is the Current Desired Path
- Codes to Know
- Default Gateway Problems
- Default Gateway Problems Continued
- DNS Issues
- DNS Issues Continued
- Resolution Mapping with Ping
- ACL Issues
- ACL Issues Continued
- Correct the ACL
- Permitting Telnet
- Summary

**Troubleshoot IPv6 Connectivity**
- Introduction
- IPv6 Address Types
- Private Addresses
- IPv6 Address Types Continued
- How to Troubleshoot IPv6 Connectivity
- Physical Connectivity
- Verify End-to-End Connectivity
- Verify End-to-End Connectivity Continued
- Using Telnet

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- Show Neighbor
- Show IPv6 Neighbors
- Identifying the Path
- Default Gatway Problems
- DNS Problems
- DNS Problems Continued
- ACL Problems
- ACL Problems Continued
- Summary
- Summary

**Implmenting EIGRP**
- Introduction
- Routing by Rumor
- Administrative Distance
- EIGRP Features
- EIGRP Path Selection
- EIGRP Path Selection Continued
- The EIGRP Metric
- The EIGRP Metric Continued
- Configuring EIGRP
- Verify Neighbors
- Verify EIGRP
- Verify EIGRP Continued
- EIGRP Load Balancing
- Summary
- Summary

**Implmenting EIGRP for IPv6**
- Introduction
- Demo: Troubleshooting EIGRP
- Demo: OSPF
- EIGRP for IPv6
- Demo: EIGRP for IPv6
- Demo: EIGRP Routes
- Demo: Headquarters and Peers
- Supporting Multiple Protocols
- EIGRP Commands for Configuration
- EIGRP Commands for Configuration Continued
- Verify Interface and Neighbors
- Verify the Toplogy Table
- Summary
- Summary

**Troubleshooting EIGRP**
- Introduction
- EIGRP Troubleshooting Components
- Troubleshooting EIGRP Neighbors
- Troubleshooting EIGRP Neighbors Continued
- EIGRP AS Mismatch
- Serial Interfaces on the Link
- Passive Interfaces
- EIGRP Routing Table Troubleshooting
- EIGRP Routing Table Troubleshooting Continued
- Summary
- Summary

**OSPF Overview**
- Introduction
- OSPF
- Data Stored in a Link-State Protocol
- Metric
- OSPF Adjacencies
- Establishing OSPF Neighbor Adjacencies
- Building the Link-State Database
- What Are OSPF Areas
- OSPF Router Types
- LSAs
- Basic LSA Types
- Summary
- Summary

**Multiarea OSPF Implementation**
- Introduction
- Multiarea OSPF Planning
- Multiarea OSPF Configuration Continued
- Multiarea OSPF Configuration Continued
- Verify Multiarea OSPF
- Verify Multiarea OSPF Continued
- Summary
- Summary

**Troubleshooting Multiearea OSPF**
- Introduction
- OSPF Neighbor States
- OSPF Neighbor States Continued
- Troubleshooting OSPF
- OSPF Neighbor Problems
- OSPF Neighbor Problems Continued
- OSPG Area
- Enabling Interfaces for OSPF
- Passive State
- HQ Advertisement
- Other Routing Protocols
- Summary
- Summary

**OSPF Demo**
- Introduction
- Demo: Finding a Route
- Demo: Advertising the Interface
- Demo: Optimal Route
- Demo: Adjacencies
- Demo: IPv6 Network Addresses
- Demo: IPv6 Network Addresses Continued
- Demo: IPv6 Gateways and OSPF
- Demo: IPv6 OSPF Continued
- Demo: OSPF Neighbors
- OSPF v3
- Configuring OSPFv3
- Verify OSPFv3
- Verify OSPFv3 Continued
- Summary
- Summary

**Establish WAN Connection Using Frame Relay**
- Introduction
- What Is Frame Relay
- What Is Frame Relay Continued
- Topologies
- Reachability Issues
- Reachability Issues Continued
- Frame Relay Signaling
- Frame Relay Mapping
- Frame Relay Mapping Continued
- Manual Frame Relay Mapping
- How to Configure Frame Relay
- How to Configure Frame Relay Continued
- Split Horizon
- Configure Point-to=Point Frame Relay
- Multipoint Frame Relay Configuration
- How to Verify Frame Relay
- How to Verify Frame Relay Continued
- Summary
- Summary

**Configuring Serial Encapsulation**
- Introduction
- Configuring Serial Encapsulation
- Configuring a Serial Interface
- Configuring a Serial Interface Continued
- HDLC Protocol
- HDLC Protocol Continued
- Other Point-to-Point Protocols
- Configuring PPP
- Configuring PPP Continued
- PAP
- CHAP
- How to Configure CHAP
- How to Configure CHAP Continued
- Verify CHAP
- Verify CHAP Continued
- Troubleshooting Serial Interfaces
- MLP
- MLP Configuration
- MLP Configuration Continued
- PPPoE
- PPPoE Client
- PPPoE Client Continued
- Verify PPPoE Client
- Summary
- Summary

**Understanding WAN Technologies**
- Introduction
- What Is the WAN
- What Is the WAN Continued
- WAN Components
- WAN Components Continued
- WAN Serial Cabling
- L2 WAN Protocols
- Options for the WAN
- Options for the WAN Continued
- Summary
- Summary

**VPN Solutions**
- Introduction
- Benefits of Secure VPNs
- Benefits of Secure VPNs Continued
- Other Cisco SSL Solutions
- Characteristics of IPSec
- Summary
- Summary

**WAN Demo**
- Introduction
- Demo: Break Serial Link
- Demo: Verifying Authentication
- Demo: Frame Relay Connection
- Demo: Frame Relay Mapping
- Demo: Verifying Frame Relay
- Demo: Configure Interface
- Demo: Troubleshooting a Connection
- Demo: Troubleshooting a Connection Continued
- Demo: Topology Table
- Demo: Advertising Routes
- Summary

**Configure GRE Tunnels**
- Introduction
- Demo: Default Tunneling
- Demo: Ends of the Tunnel
- Demo: Using a Tunnel
- Demo: GRE Tunnel
- GRE Tunnel
- Demo: Home Network
- Demo: Virtual Template
- Demo: Pinging a Home Network
- GRE Tunnel Overview
- How to Configure the GRE
- How to Configure the GRE (Cont.)
- Verify the Tunnel
- Summary
- Summary

**Configure Device Support for Network Protocols**
- Introduction
- Overview
- SNMP Versions
- Obtaining Data from an SNMP Agent
- Obtaining Data from an SNMP Agent Continued
- SNMP Configuration
- Syslog Format

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# Cisco Interconnecting Cisco Networking Devices Part 2



- Syslog Configuration
- NetFlow Overview
- NetFlow Overview Continued
- NetFlow Components
- Flow
- NetFlow Architecture
- Demo: Configuring NetFlow
- Configuring NetFlow Continued
- Summary
- Summary

**Managing Cisco Devices**
- Introduction
- Internal Components of a Router
- What does ROM Do
- Router Bootup Sequence
- Configuration Register
- Changing the Configuration Register
- How the IOS Is Found
- IOS Loading
- IOS Loading Continued
- Loading the IOS Configuration File
- Loading the IOS Configuration File Continued
- Cisco IOS Integrated File System
- Viewing the Integrated System
- Managing IOS Images
- Reading the IOS Filename
- Backing up the Image
- Backing up the Image Continued
- Upgrading the IOS
- Upgrading the IOS Continued
- Copy Command Result
- Managing Device Configuration Files
- Managing Device Configuration Files Continued
- Recovering the Enable Password/Secret
- Recovering the Enable Password/Secret Continued
- Summary
- Summary

**Licensing Demo**
- Introduction
- Demo: Router Logs
- Demo: Severity Levels
- Demo: Router Secrets
- Demo: Changing a Router Secret
- Demo: Remove Configurations
- Licensing Intro
- Demo: Basic Configuration
- Demo: Create Sub-Interfaces
- Demo: Trunking
- Overview of Licensing
- Overview of Licensing Continued
- Verifying the Licenses
- Summary

**Licensing and Superlab Demo Part 1**
- Introduction
- Installing a Permanent License
- Installing an Evaluation License
- Back up the License
- Uninstalling the License
- Password Recovery
- Recovery
- Config-Register
- Config-Register Continued
- Universal Images
- Demo: Create Channel Groups
- Demo: Channel Group Verifications
- Demo: Multiple Hosts Per Port
- Demo: DHCP Service
- Demo: Prepare for IPv6 Addresses
- Demo: Assign IPv6 Addresses
- Demo: IPv6 Neighbors
- Summary

**Superlab Demo Part 2**
- Introduction
- Demo: Configure Serial Links
- Demo: Encapsulation
- Demo: Frame Relay for Links
- Demo: NAT
- Demo: IP Translations
- Demo: Routing Protocols
- Demo: OSPF Interface
- Demo:
- Summary

**Superlab Demo Part 3**
- Introduction
- Demo: EIGRP
- Demo: EIGRP Continued
- Demo: IPv6 Neighbors
- Demo: Control Server Access
- Demo: Access List
- Demo: Troubleshoot Access List
- Demo: Per-VLAN Spanning Tree
- Summary