

CCNA 3

1 - Single-Area OSPFv2 Concepts

1.0 - Introduction

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- 1.0.2 - What will I learn to do in this module?Contains: *Text*
- 1.0.3 - Video - Download and Install Packet TracerContains: *Text, Videos*
- 1.0.4 - Video - Getting Started in Cisco Packet TracerContains: *Text, Videos*
- 1.0.5 - Packet Tracer - Logical and Physical Mode ExplorationContains: *Text, Packet Tracers*

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- 1.1.1 - Introduction to OSPFContains: *Text*
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- 1.1.3 - Link-State OperationContains: *Text*
- 1.1.4 - Single-Area and Multiarea OSPFContains: *Text*
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- 1.1.6 - OSPFv3Contains: *Text*
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9 - QoS Concepts

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9.1 - Network Transmission Quality

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9.1.2 - Prioritizing TrafficContains: *Text*

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9.1.4 - Packet LossContains: *Text*

9.1.5 - Check Your Understanding - Network Transmission QualityContains: *Check Your Understandings*

9.2 - Traffic Characteristics

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9.2.6 - Check Your Understanding - Traffic CharacteristicsContains: *Check Your Understandings*

9.3 - Queuing Algorithms

9.3.1 - Video Tutorial - QoS AlgorithmsContains: *Text, Videos*

9.3.2 - Queuing OverviewContains: *Text*

9.3.3 - First In First OutContains: *Text*

9.3.4 - Weighted Fair Queuing (WFQ)Contains: *Text*

9.3.5 - Class-Based Weighted Fair Queuing (CBWFQ)Contains: *Text*

9.3.6 - Low Latency Queuing (LLQ)Contains: *Text*

9.3.7 - Check Your Understanding - Queuing AlgorithmsContains: *Check Your Understandings*

9.4 - QoS Models

9.4.1 - Video Tutorial - QoS ModelsContains: *Text, Videos*

9.4.2 - Selecting an Appropriate QoS Policy ModelContains: *Text*

9.4.3 - Best EffortContains: *Text*

9.4.4 - Integrated ServicesContains: *Text*

9.4.5 - Differentiated ServicesContains: *Text*

9.4.6 - Check Your Understanding - QoS ModelsContains: *Check Your Understandings*

9.5 - QoS Implementation Techniques

9.5.1 - Video Tutorial - QoS Implementation TechniquesContains: *Text, Videos*

9.5.2 - Avoiding Packet LossContains: *Text*

9.5.3 - QoS ToolsContains: *Text*

9.5.4 - Classification and MarkingContains: *Text*

9.5.5 - Marking at Layer 2Contains: *Text*

9.5.6 - Marking at Layer 3Contains: *Text*

9.5.7 - Type of Service and Traffic Class FieldContains: *Text*

- 9.5.8 - DSCP ValuesContains: *Text*
- 9.5.9 - Class Selector BitsContains: *Text*
- 9.5.10 - Trust BoundariesContains: *Text*
- 9.5.11 - Congestion AvoidanceContains: *Text*
- 9.5.12 - Shaping and PolicingContains: *Text*
- 9.5.13 - QoS Policy GuidelinesContains: *Text*
- 9.5.14 - Check Your Understanding - QoS Implementation TechniquesContains: *Check Your Understandings*
- 9.6 - Module Practice and Quiz
 - 9.6.1 - What did I learn in this module?Contains: *Text*
 - 9.6.2 - Module Quiz - QoS ConceptsContains: *Module Quiz*

- 10 - Network Management
 - 10.0 - Introduction
 - 10.0.1 - Why should I take this module?Contains: *Text*
 - 10.0.2 - What will I learn to do in this module?Contains: *Text*
 - 10.1 - Device Discovery with CDP
 - 10.1.1 - CDP OverviewContains: *Text*
 - 10.1.2 - Configure and Verify CDPContains: *Text*
 - 10.1.3 - Discover Devices by Using CDPContains: *Text*
 - 10.1.4 - Syntax Checker - Configure and Verify CDPContains: *Text, Syntax Checkers*
 - 10.1.5 - Packet Tracer - Use CDP to Map a NetworkContains: *Text, Packet Tracers*
 - 10.2 - Device Discovery with LLDP
 - 10.2.1 - LLDP OverviewContains: *Text*
 - 10.2.2 - Configure and Verify LLDPContains: *Text*
 - 10.2.3 - Discover Devices by Using LLDPContains: *Text*
 - 10.2.4 - Syntax Checker - Configure and Verify LLDPContains: *Text, Syntax Checkers*
 - 10.2.5 - Check Your Understanding - Compare CDP and LLDPContains: *Check Your Understandings*
 - 10.2.6 - Packet Tracer - Use LLDP to Map a NetworkContains: *Text, Packet Tracers*
 - 10.3 - NTP
 - 10.3.1 - Time and Calendar ServicesContains: *Text*
 - 10.3.2 - NTP OperationContains: *Text*
 - 10.3.3 - Configure and Verify NTPContains: *Text*
 - 10.3.4 - Packet Tracer - Configure and Verify NTPContains: *Text, Packet Tracers*
 - 10.4 - SNMP
 - 10.4.1 - Introduction to SNMPContains: *Text*
 - 10.4.2 - SNMP OperationContains: *Text*
 - 10.4.3 - SNMP Agent TrapsContains: *Text*
 - 10.4.4 - SNMP VersionsContains: *Text*
 - 10.4.5 - Check Your Understanding - SNMP VersionsContains: *Check Your Understandings*
 - 10.4.6 - Community StringsContains: *Text, Animations*
 - 10.4.7 - MIB Object IDContains: *Text*
 - 10.4.8 - SNMP Polling ScenarioContains: *Text*
 - 10.4.9 - SNMP Object NavigatorContains: *Text*
 - 10.4.10 - Lab - Research Network Monitoring SoftwareContains: *Text, Labs*
 - 10.5 - Syslog
 - 10.5.1 - Introduction to SyslogContains: *Text*

- 10.5.2 - Syslog OperationContains: *Text*
- 10.5.3 - Syslog Message FormatContains: *Text*
- 10.5.4 - Syslog FacilitiesContains: *Text*
- 10.5.5 - Configure Syslog TimestampContains: *Text*
- 10.5.6 - Check Your Understanding - Syslog OperationContains: *Text, Check Your Understandings*
- 10.6 - Router and Switch File Maintenance
 - 10.6.1 - Router File SystemsContains: *Text*
 - 10.6.2 - Switch File SystemsContains: *Text*
 - 10.6.3 - Use a Text File to Back Up a ConfigurationContains: *Text*
 - 10.6.4 - Use a Text File to Restore a ConfigurationContains: *Text*
 - 10.6.5 - Use TFTP to Back Up and Restore a ConfigurationContains: *Text*
 - 10.6.6 - USB Ports on a Cisco RouterContains: *Text*
 - 10.6.7 - Use USB to Back Up and Restore a ConfigurationContains: *Text*
 - 10.6.8 - Password Recovery ProceduresContains: *Text*
 - 10.6.10 - Packet Tracer - Back Up Configuration FilesContains: *Text, Packet Tracers*
 - 10.6.11 - Lab - Use Tera Term to Manage Router Configuration FilesContains: *Text, Labs*
 - 10.6.12 - Lab - Use TFTP, Flash, and USB to Manage Configuration FilesContains: *Text, Packet Tracers, Labs*
 - 10.6.13 - Lab - Research Password Recovery ProceduresContains: *Text, Packet Tracers, Labs*
- 10.7 - IOS Image Management
 - 10.7.1 - Video - Managing Cisco IOS ImagesContains: *Text, Videos*
 - 10.7.2 - TFTP Servers as a Backup LocationContains: *Text*
 - 10.7.3 - Backup IOS Image to TFTP Server ExampleContains: *Text*
 - 10.7.4 - Copy an IOS Image to a Device ExampleContains: *Text*
 - 10.7.5 - The boot system CommandContains: *Text*
 - 10.7.6 - Packet Tracer - Use a TFTP Server to Upgrade a Cisco IOS ImageContains: *Text, Packet Tracers*
- 10.8 - Module Practice and Quiz
 - 10.8.1 - Packet Tracer - Configure CDP, LLDP, and NTPContains: *Text, Packet Tracers*
 - 10.8.2 - Lab - Configure CDP, LLDP, and NTPContains: *Text, Labs*
 - 10.8.3 - What did I learn in this module?Contains: *Text*
 - 10.8.4 - Module Quiz - Network ManagementContains: *Module Quiz*
- 11 - Network Design
 - 11.0 - Introduction
 - 11.0.1 - Why should I take this module?Contains: *Text*
 - 11.0.2 - What will I learn to do in this module?Contains: *Text*
 - 11.1 - Hierarchical Networks
 - 11.1.1 - Video - Three-Layer Network DesignContains: *Videos*
 - 11.1.2 - The Need to Scale the NetworkContains: *Text, Animations*
 - 11.1.3 - Borderless Switched NetworksContains: *Text*
 - 11.1.4 - Hierarchy in the Borderless Switched NetworkContains: *Text*
 - 11.1.5 - Access, Distribution, and Core Layer FunctionsContains: *Text*
 - 11.1.7 - Role of Switched NetworksContains: *Text*
 - 11.1.8 - Check Your Understanding - Hierarchical NetworksContains: *Check Your Understandings*

11.2 - Scalable Networks

11.2.1 - Design for ScalabilityContains: *Text*

11.2.2 - Plan for RedundancyContains: *Text*

11.2.3 - Reduce Failure Domain SizeContains: *Text*

11.2.4 - Increase BandwidthContains: *Text*

11.2.5 - Expand the Access LayerContains: *Text*

11.2.6 - Tune Routing ProtocolsContains: *Text*

11.2.7 - Check Your Understanding - Scalable NetworksContains: *Check Your Understandings*

11.3 - Switch Hardware

11.3.1 - Switch PlatformsContains: *Text*

11.3.2 - Switch Form FactorsContains: *Text*

11.3.3 - Port DensityContains: *Text*

11.3.4 - Forwarding RatesContains: *Text*

11.3.5 - Power over EthernetContains: *Text*

11.3.6 - Multilayer SwitchingContains: *Text*

11.3.7 - Business Considerations for Switch SelectionContains: *Text*

11.3.8 - Check Your Understanding - Switch HardwareContains: *Check Your Understandings*

11.4 - Router Hardware

11.4.1 - Router RequirementsContains: *Text*

11.4.2 - Cisco RoutersContains: *Text*

11.4.3 - Router Form FactorsContains: *Text*

11.4.4 - Check Your Understanding - Router HardwareContains: *Check Your Understandings*

11.5 - Module Practice and Quiz

11.5.1 - Packet Tracer - Compare Layer 2 and Layer 3 DevicesContains: *Text, Packet Tracers*

11.5.2 - What did I learn in this module?Contains: *Text*

11.5.3 - Module Quiz - Network DesignContains: *Module Quiz*

12 - Network Troubleshooting

12.0 - Introduction

12.0.1 - Why should I take this module?Contains: *Text*

12.0.2 - What will I learn to do in this module?Contains: *Text*

12.1 - Network Documentation

12.1.1 - Documentation OverviewContains: *Text*

12.1.2 - Network Topology DiagramsContains: *Text*

12.1.3 - Network Device DocumentationContains: *Text*

12.1.4 - Establish a Network BaselineContains: *Text*

12.1.5 - Step 1 - Determine What Types of Data to CollectContains: *Text*

12.1.6 - Step 2 - Identify Devices and Ports of InterestContains: *Text*

12.1.7 - Step 3 - Determine the Baseline DurationContains: *Text*

12.1.8 - Data MeasurementContains: *Text*

12.1.9 - Check Your Understanding - Network DocumentationContains: *Check Your Understandings*

12.2 - Troubleshooting Process

12.2.1 - General Troubleshooting ProceduresContains: *Text*

12.2.2 - Seven-Step Troubleshooting ProcessContains: *Text*

12.2.3 - Question End UsersContains: *Text*

- 12.2.4 - Gather InformationContains: *Text*
- 12.2.5 - Troubleshooting with Layered ModelsContains: *Text*
- 12.2.6 - Structured Troubleshooting MethodsContains: *Text*
- 12.2.7 - Guidelines for Selecting a Troubleshooting MethodContains: *Text*
- 12.2.8 - Check Your Understanding - Troubleshooting ProcessContains: *Check Your Understandings*
- 12.3 - Troubleshooting Tools
 - 12.3.1 - Software Troubleshooting ToolsContains: *Text*
 - 12.3.2 - Protocol AnalyzersContains: *Text*
 - 12.3.3 - Hardware Troubleshooting ToolsContains: *Text*
 - 12.3.4 - Syslog Server as a Troubleshooting ToolContains: *Text*
 - 12.3.5 - Check Your Understanding - Troubleshooting ToolsContains: *Check Your Understandings*
- 12.4 - Symptoms and Causes of Network Problems
 - 12.4.1 - Physical Layer TroubleshootingContains: *Text*
 - 12.4.2 - Data Link Layer TroubleshootingContains: *Text*
 - 12.4.3 - Network Layer TroubleshootingContains: *Text*
 - 12.4.4 - Transport Layer Troubleshooting - ACLsContains: *Text*
 - 12.4.5 - Transport Layer Troubleshooting - NAT for IPv4Contains: *Text*
 - 12.4.6 - Application Layer TroubleshootingContains: *Text*
 - 12.4.7 - Check Your Understanding - Symptoms and Causes of Network ProblemsContains: *Check Your Understandings*
- 12.5 - Troubleshooting IP Connectivity
 - 12.5.1 - Components of Troubleshooting End-to-End ConnectivityContains: *Text*
 - 12.5.2 - End-to-End Connectivity Problem Initiates TroubleshootingContains: *Text*
 - 12.5.3 - Step 1 - Verify the Physical LayerContains: *Text*
 - 12.5.4 - Step 2 - Check for Duplex MismatchesContains: *Text*
 - 12.5.5 - Step 3 - Verify Addressing on the Local NetworkContains: *Text*
 - 12.5.6 - Troubleshoot VLAN Assignment ExampleContains: *Text*
 - 12.5.7 - Step 4 - Verify Default GatewayContains: *Text*
 - 12.5.8 - Troubleshoot IPv6 Default Gateway ExampleContains: *Text*
 - 12.5.9 - Step 5 - Verify Correct PathContains: *Text*
 - 12.5.10 - Step 6 - Verify the Transport LayerContains: *Text*
 - 12.5.11 - Step 7 - Verify ACLsContains: *Text*
 - 12.5.12 - Step 8 - Verify DNSContains: *Text*
 - 12.5.13 - Packet Tracer - Troubleshoot Enterprise NetworksContains: *Text, Packet Tracers*
- 12.6 - Module Practice and Quiz
 - 12.6.1 - Packet Tracer - Troubleshooting Challenge - Document the NetworkContains: *Text, Packet Tracers*
 - 12.6.2 - Packet Tracer - Troubleshooting Challenge - Use Documentation to Solve IssuesContains: *Text, Packet Tracers*
 - 12.6.3 - What did I learn in this module?Contains: *Text*
 - 12.6.4 - Module Quiz - Network TroubleshootingContains: *Module Quiz*
- 13 - Network Virtualization
 - 13.0 - Introduction
 - 13.0.1 - Why should I take this module?Contains: *Text*
 - 13.0.2 - What will I learn to do in this module?Contains: *Text*
 - 13.1 - Cloud Computing

- 13.1.1 - Video - Cloud and VirtualizationContains: *Text, Videos*
- 13.1.2 - Cloud OverviewContains: *Text*
- 13.1.3 - Cloud ServicesContains: *Text*
- 13.1.4 - Cloud ModelsContains: *Text*
- 13.1.5 - Cloud Computing versus Data CenterContains: *Text*
- 13.1.6 - Check Your Understanding - Cloud ComputingContains: *Check Your Understandings*
- 13.2 - Virtualization
 - 13.2.1 - Cloud Computing and VirtualizationContains: *Text*
 - 13.2.2 - Dedicated ServersContains: *Text*
 - 13.2.3 - Server VirtualizationContains: *Text*
 - 13.2.4 - Advantages of VirtualizationContains: *Text*
 - 13.2.5 - Abstraction LayersContains: *Text*
 - 13.2.6 - Type 2 HypervisorsContains: *Text*
 - 13.2.7 - Check Your Understanding - VirtualizationContains: *Check Your Understandings*
- 13.3 - Virtual Network Infrastructure
 - 13.3.1 - Type 1 HypervisorsContains: *Text*
 - 13.3.2 - Installing a VM on a HypervisorContains: *Text*
 - 13.3.3 - The Complexity of Network VirtualizationContains: *Text*
 - 13.3.4 - Check Your Understanding - Virtual Network InfrastructureContains: *Check Your Understandings*
- 13.4 - Software-Defined Networking
 - 13.4.1 - Video - Software-Defined NetworkingContains: *Text, Videos*
 - 13.4.2 - Control Plane and Data PlaneContains: *Text*
 - 13.4.3 - Network Virtualization TechnologiesContains: *Text*
 - 13.4.4 - Traditional and SDN ArchitecturesContains: *Text*
 - 13.4.5 - Check Your Understanding - Software-Defined NetworkingContains: *Check Your Understandings*
- 13.5 - Controllers
 - 13.5.1 - SDN Controller and OperationsContains: *Text*
 - 13.5.2 - Video - Cisco ACIContains: *Text, Videos*
 - 13.5.3 - Core Components of ACIContains: *Text*
 - 13.5.4 - Spine-Leaf TopologyContains: *Text*
 - 13.5.5 - SDN TypesContains: *Text*
 - 13.5.6 - APIC-EM FeaturesContains: *Text*
 - 13.5.7 - APIC-EM Path TraceContains: *Text*
 - 13.5.8 - Check Your Understanding - ControllersContains: *Check Your Understandings*
- 13.6 - Module Practice and Quiz
 - 13.6.1 - Lab - Install Linux in a Virtual Machine and Explore the GUIContains: *Text, Labs*
 - 13.6.2 - What did I learn in this module?Contains: *Text*
 - 13.6.3 - Module Quiz - Network VirtualizationContains: *Module Quiz*
- 14 - Network Automation
 - 14.0 - Introduction
 - 14.0.1 - Why should I take this module?Contains: *Text*
 - 14.0.2 - What will I learn in this module?Contains: *Text*
 - 14.1 - Automation Overview

- 14.1.1 - Video - Automation EverywhereContains: *Text, Videos*
- 14.1.2 - The Increase in AutomationContains: *Text*
- 14.1.3 - Thinking DevicesContains: *Text*
- 14.1.4 - Check Your Understanding - Benefits of AutomationContains: *Check Your Understandings*
- 14.2 - Data Formats
 - 14.2.1 - Video - Data FormatsContains: *Text, Videos*
 - 14.2.2 - The Data Formats ConceptContains: *Text*
 - 14.2.3 - Data Format RulesContains: *Text*
 - 14.2.4 - Compare Data FormatsContains: *Text*
 - 14.2.5 - JSON Data FormatContains: *Text*
 - 14.2.6 - JSON Syntax RulesContains: *Text*
 - 14.2.7 - YAML Data FormatContains: *Text*
 - 14.2.8 - XML Data FormatContains: *Text*
 - 14.2.9 - Check Your Understanding - Data FormatsContains: *Check Your Understandings*
- 14.3 - APIs
 - 14.3.1 - Video - APIsContains: *Text, Videos*
 - 14.3.2 - The API ConceptContains: *Text*
 - 14.3.3 - An API ExampleContains: *Text*
 - 14.3.4 - Open, Internal, and Partner APIsContains: *Text*
 - 14.3.5 - Types of Web Service APIsContains: *Text*
 - 14.3.6 - Check Your Understanding - APIsContains: *Check Your Understandings*
- 14.4 - REST
 - 14.4.1 - Video - RESTContains: *Text, Videos*
 - 14.4.2 - REST and RESTful APIContains: *Text*
 - 14.4.3 - RESTful ImplementationContains: *Text*
 - 14.4.4 - URI, URN, and URLContains: *Text*
 - 14.4.5 - Anatomy of a RESTful RequestContains: *Text*
 - 14.4.6 - RESTful API ApplicationsContains: *Text*
 - 14.4.7 - Check Your Understanding - RESTContains: *Check Your Understandings*
- 14.5 - Configuration Management Tools
 - 14.5.1 - Video - Configuration Management ToolsContains: *Text, Videos*
 - 14.5.2 - Traditional Network ConfigurationContains: *Text*
 - 14.5.3 - Network AutomationContains: *Text*
 - 14.5.4 - Configuration Management ToolsContains: *Text*
 - 14.5.5 - Compare Ansible, Chef, Puppet, and SaltStackContains: *Text*
 - 14.5.6 - Check Your Understanding - Configuration ManagementContains: *Check Your Understandings*
- 14.6 - IBN and Cisco DNA Center
 - 14.6.1 - Video - Intent-Based NetworkingContains: *Text, Videos*
 - 14.6.2 - Intent-Based Networking OverviewContains: *Text*
 - 14.6.3 - Network Infrastructure as FabricContains: *Text*
 - 14.6.4 - Cisco Digital Network Architecture (DNA)Contains: *Text*
 - 14.6.5 - Cisco DNA CenterContains: *Text*
 - 14.6.6 - Video - DNA Center Overview and Platform APIsContains: *Text, Videos*
 - 14.6.7 - Video - DNA Center Design and ProvisionContains: *Text, Videos*
 - 14.6.8 - Video - DNA Center Policy and AssuranceContains: *Text, Videos*
 - 14.6.9 - Video - DNA Center Troubleshooting User ConnectivityContains: *Text, Videos*

- 14.6.10 - Check Your Understanding - IBN and Cisco DNA CenterContains: *Check Your Understandings*
- 14.7 - Module Practice and Quiz
 - 14.7.1 - What did I learn in this module?Contains: *Text*
 - 14.7.2 - Module Quiz - Network AutomationContains: *Module Quiz*