

CCNA R&S: Routing and Switching Essentials Release Notes

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Purpose

Cisco CCNA® Routing and Switching is the fifth major release of the Cisco Networking Academy® CCNA curriculum. Routing and Switching Essentials is one of the two possible second courses in the curriculum. These notes provide detailed information about this release, including course content, known issues, and support information.

Release Content

Table 1. Identifies content features included in the Routing and Switching Essentials course release

Component	Description
E-Learning Content	11 chapters
Labs	33 hands-on labs use a combination of 1941 routers (ISR G2s) and 2960 switches with the Cisco IOS® 15 software 1 networking research and exercise lab 1 video demo
Skills Assessments	1 skills assessment that uses equipment to verify the development of course skills
Cisco® Packet Tracer Activities PT version 6.0.1 or higher is required	46 Packet Tracer configuration and troubleshooting activities 20 Packet Tracer simulation and investigation activities
Packet Tracer Skills Integration Challenges	11 skills integration challenge activities
Interactive Activities	65 interactive activities embedded throughout the course
Modeling Activities	22 modeling activities embedded throughout the course
Syntax Checkers	79 syntax checkers to practice entering Cisco IOS commands
Pre-Test	1 pre-test to measure pre-existing knowledge This can be used to understand what students know before starting the course to direct planning and customization of the curriculum.
Section Quizzes	2 section quizzes that target specific topics within a section or across sections
Chapter Quizzes	11 modifiable chapter quizzes
Chapter Exams	11 chapter exams containing simulation-based, multiple choice, drag and drop, and fill-in-the-blank questions
Practice Packet Tracer Skills Assessment	3 variable practice PTSAs to support skills acquisition; one at Chapter 2, one at chapter 6, and one at the end of the course
Practice Final Exam	1 practice final exam
Final Exam	1 final exam with field test pool items
ICND1 Certification Practice Final	1 practice final exam to prepare students for the CCENT (ICND1) exam
Accessibility	11 chapters containing accessible text and media text Videos provide closed captioning (CC).

Known Issues and Caveats

Table 2. Identifies known issues and caveats for the Routing and Switching Essentials course.

Item	Description
Text Area Sizing	After resizing the text area of a page, subsequent pages retain the same text area size. The text area size will return to default when the browser session ends.
Form-Fillable PDFs	Open these documents in Adobe Reader to help ensure the form-fillable fields load properly. Opening these documents in a web browser is not recommended.
Syntax Checker	This is a new tool made available to practice entering Cisco IOS commands. It is intended to familiarize students with the command syntax when implementing particular technologies. It is limited in functionality to the specific instructions provided in a Syntax Checker activity.

Certification Exam Alignment

Table 3. Identifies topics that have been removed from the Cisco ICND1 (640-822) certification exam and topics that have been added to the new ICND1 (100-101) certification exam.

Topics Removed from ICND1 640-822 Exam	Topics Added to ICND1 100-101 Exam
Securing the Network	Implementing VLSM
Understanding the Challenges of Shared LANs	Scaling the Network with NAT and PAT
Solving Network Challenges with Switched LAN Technologies	Managing Traffic Using ACLs
Wireless LANs	Implementing VLANs and Trunks
Using Cisco SDM	Routing Between VLANs
Configuring Serial Encapsulation	Implementing Single-Area OSPF
Enabling RIP	Introducing Basic IPv6
	Understanding IPv6
	Configuring IPv6 Routing

Table 4. Identifies topics that have been added to the new ICND1 (100-101) certification exam and where they are covered in the CCNA Routing and Switching: Routing and Switching Essentials course.

Note: Some ICND1 certification exam topics are not included in this course and are covered in other CCNA Routing and Switching courses. These are identified as “covered in another CCNA Routing and Switching course” in the table below.

ICND1 (100-101)	Routing and Switching Essentials
Operation of IP Data Network	
1.1 Recognize the purpose and functions of various network devices such as routers, switches, bridges, and hubs	Chapter 1: Introduction to Switched Networks Section 1.1: LAN Design Chapter 5: Inter-VLAN Routing Section 5.1: Inter-VLAN Routing Configuration
1.2 Select the components required to meet a given network specification	Chapter 1: Introduction to Switched Networks Section 1.1: LAN Design Chapter 5: Inter-VLAN Routing Section 5.1: Inter-VLAN Routing Configuration
1.3 Identify common applications and their impact on the network	Chapter 1: Introduction to Switched Networks Section 1.1: LAN Design

1.4 Describe the purpose and basic operation of the protocols in the OSI and TCP/IP models	Chapter 9: Access Control Lists Section 9.1: IP ACL Operation
1.5 Predict the data flow between two hosts across a network	Chapter 4: Routing Concepts Section 4.2: Routing Decisions Chapter 5: Inter-VLAN Routing Section 5.1: Inter-VLAN Routing Configuration Chapter 6: Static Routing Section 6.5: Troubleshoot Static and Default Route Issues Chapter 9: Access Control Lists Section 9.1: IP ACL Operation
1.6 Identify the appropriate media, cables, ports, and connectors to connect Cisco network devices to other network devices and hosts in a LAN	Chapter 4: Routing Concepts Section 4.1: Initial Configuration of a Router Chapter 5: Inter-VLAN Routing Section 5.1: Inter-VLAN Routing Configuration
LAN Switching Technologies	
2.1 Determine the technology and media access control method for Ethernet networks	Covered in another CCNA Routing and Switching course
2.2 Identify basic switching concepts and the operation of Cisco switches	Chapter 1: Introduction to Switched Networks Section 1.2: The Switched Environment Chapter 2: Basic Switching Concepts and Configuration Section 2.1: Basic Switch Configuration Chapter 3: Implementing VLAN Security Section 3.1: VLAN Segmentation Chapter 5: Inter-VLAN Routing Section 5.1: Inter-VLAN Routing Configuration Section 5.3: Layer 3 Switching
2.3 Configure and verify initial switch configuration including remote access management	Chapter 1: Introduction to Switched Networks Section 1.2: The Switched Environment Chapter 2: Basic Switching Concepts and Configuration Section 2.1: Basic Switch Configuration Chapter 3: Implementing VLAN Security Section 3.3: VLAN Security and Design
2.4 Verify network status and switch operation using basic utilities such as ping, telnet, and ssh	Chapter 5: Inter-VLAN Routing Section 5.1: Inter-VLAN Routing Configuration Section 5.3: Layer 3 Switching
2.5 Describe how VLANs create logically separate networks and the need for routing between them	Chapter 2: Basic Switching Concepts and Configuration Section 2.1: Basic Switch Configuration Chapter 3: Implementing VLAN Security Section 3.1: VLAN Segmentation Chapter 5: Inter-VLAN Routing Section 5.1: Inter-VLAN Routing Configuration Section 5.2: Troubleshoot Inter-VLAN Routing
2.6 Configure and verify VLANs	Chapter 2: Basic Switching Concepts and Configuration Section 2.1: Basic Switch Configuration Chapter 5: Inter-VLAN Routing Section 5.1: Inter-VLAN Routing Configuration

	Section 5.3: Layer 3 Switching
2.7 Configure and verify trunking on Cisco switches	Chapter 2: Basic Switching Concepts and Configuration Section 2.1: Basic Switch Configuration Chapter 3: Implementing VLAN Security Section 3.2: VLAN Implementations Section 3.3: VLAN Security and Design Chapter 5: Inter-VLAN Routing Section 5.1: Inter-VLAN Routing Configuration Section 5.2: Troubleshoot Inter-VLAN Routing Section 5.3: Layer 3 Switching
IP Addressing (IPv4/IPv6)	
3.1 Describe the operation and necessity of using private and public IP addresses for IPv4 addressing	Covered in another CCNA Routing and Switching course
3.2 Identify the appropriate IPv6 addressing scheme to satisfy addressing requirements in a LAN/WAN environment	Chapter 6: Static Routing Section 6.4: Configure Summary and Floating Static Routes
3.3 Identify the appropriate IPv4 addressing scheme using VLSM and summarization to satisfy addressing requirements in a LAN/WAN environment	Chapter 6: Static Routing Section 6.3: Review of CIDR and VLSM Section 6.4: Configure Summary and Floating Static Routes
3.4 Describe the technological requirements for running IPv6 in conjunction with IPv4	Covered in another CCNA Routing and Switching course
3.5 Describe IPv6 addresses	Chapter 4: Routing Concepts Section 4.1: Initial Configuration of a Router Section 4.3: Router Operation Chapter 8: Single-Area OSPF Section 8.3: Configuring Single-Area OSPFv3 Chapter 10: DHCP Section 10.2: Dynamic Host Configuration Protocol v6
IP Routing Technologies	
4.1 Describe basic routing concepts	Chapter 4: Routing Concepts Section 4.1: Initial Configuration of a Router Section 4.2: Routing Decisions Section 4.3: Router Operation Chapter 5: Inter-VLAN Routing Section 5.1: Inter-VLAN Routing Configuration Chapter 6: Static Routing Section 6.1: Static Routing Implementation Section 6.2: Configure Static and Default Routes Section 6.3: Review of CIDR and VLSM Section 6.4: Configure Summary and Floating Static Routes Section 6.5: Troubleshoot Static and Default Route Issues Chapter 7: Routing Dynamically Section 7.1: Dynamic Routing Protocols Section 7.5: The Routing Table

	<p>Chapter 8: Single-Area OSPF Section 8.1: Characteristics of OSPF</p>
4.2 Configure and verify utilizing the CLI to set basic router configuration	<p>Chapter 4: Routing Concepts Section 4.1: Initial Configuration of a Router Section 4.3: Router Operation</p> <p>Chapter 5: Inter-VLAN Routing Section 5.1: Inter-VLAN Routing Configuration Section 5.2: Troubleshoot Inter-VLAN Routing</p>
4.3 Configure and verify operation status of an Ethernet interface	<p>Chapter 4: Routing Concepts Section 4.1: Initial Configuration of a Router Section 4.3: Router Operation</p> <p>Chapter 5: Inter-VLAN Routing Section 5.1: Inter-VLAN Routing Configuration</p>
4.4 Verify router configuration and network connectivity	<p>Chapter 4: Routing Concepts Section 4.1: Initial Configuration of a Router Section 4.3: Router Operation</p> <p>Chapter 5: Inter-VLAN Routing Section 5.1: Inter-VLAN Routing Configuration</p> <p>Chapter 6: Static Routing Section 6.2: Configure Static and Default Routes Section 6.5: Troubleshoot Static and Default Route Issues</p> <p>Chapter 7: Routing Dynamically Section 7.1: Dynamic Routing Protocols</p> <p>Chapter 9: Access Control Lists Section 9.4: Troubleshoot ACLs</p>
4.5 Configure and verify routing configuration for a static or default route given specific routing requirements	<p>Chapter 4: Routing Concepts Section 4.3: Router Operation</p> <p>Chapter 5: Inter-VLAN Routing Section 5.3: Layer 3 Switching</p> <p>Chapter 6: Static Routing Section 6.1: Static Routing Implementation Section 6.2: Configure Static and Default Routes Section 6.3: Review of CIDR and VLSM Section 6.4: Configure Summary and Floating Static Routes Section 6.5: Troubleshoot Static and Default Route Issues</p> <p>Chapter 7: Routing Dynamically Section 7.3: RIP and RIPv2 Routing</p>
4.6 Differentiate methods of routing and routing protocols	<p>Chapter 4: Routing Concepts Section 4.1: Initial Configuration of a Router Section 4.2: Routing Decisions Section 4.3: Router Operation</p> <p>Chapter 5: Inter-VLAN Routing Section 5.1: Inter-VLAN Routing Configuration Section 5.3: Layer 3 Switching</p> <p>Chapter 6: Static Routing</p>

	<p>Section 6.1: Static Routing Implementation</p> <p>Section 6.2: Configure Static and Default Routes</p> <p>Section 6.3: Review of CIDR and VLSM</p> <p>Section 6.4: Configure Summary and Floating Static Routes</p> <p>Section 6.5: Troubleshoot Static and Default Route Issues</p> <p>Chapter 7: Routing Dynamically</p> <p>Section 7.1: Dynamic Routing Protocols</p> <p>Section 7.2: Distance Vector Routing Protocols</p> <p>Section 7.3: RIP and RIPv6 Routing</p> <p>Section 7.4: Link-State Dynamic Routing</p> <p>Section 7.5: The Routing Table</p> <p>Chapter 8: Single-Area OSPF</p> <p>Section 8.1: Characteristics of OSPF</p> <p>Section 8.2: Configuring Single-Area OSPFv2</p>
4.7 Configure and verify OSPF (single area)	<p>Chapter 8: Single-Area OSPF</p> <p>Section 8.1: Characteristics of OSPF</p> <p>Section 8.2: Configure Single-Area OSPFv2</p> <p>Section 8.3: Configure Single-Area OSPFv3</p>
4.8 Configure and verify interVLAN routing (router on a stick)	<p>Chapter 4: Routing Concepts</p> <p>Section 4.2: Routing Decisions</p> <p>Chapter 5: Inter-VLAN Routing</p> <p>Section 5.1: Inter-VLAN Routing Configuration</p> <p>Section 5.2: Troubleshoot Inter-VLAN Routing</p> <p>Section 5.3: Layer 3 Switching</p>
4.9 Configure SVI interfaces	<p>Chapter 2: Basic Switching Concepts and Configuration</p> <p>Section 2.1: Basic Switch Configuration</p> <p>Chapter 5: Inter-VLAN Routing</p> <p>Section 5.3: Layer 3 Switching</p>
IP Services	
5.1 Configure and verify DHCP	<p>Chapter 2: Basic Switching Concepts and Configuration</p> <p>Section 2.2: Switch Security: Management and Implementation</p> <p>Chapter 4: Routing Concepts</p> <p>Section 4.1: Initial Configuration of a Router</p> <p>Chapter 10: DHCP</p> <p>Section 10.1: Dynamic Host Configuration Protocol v4</p> <p>Section 10.2: Dynamic Host Configuration Protocol v6</p>
5.2 Describe the types, features, and applications of ACLs	<p>Chapter 9: Access Control Lists</p> <p>Section 9.1: IP ACL Operation</p> <p>Section 9.2: Standard IPv4 ACLs</p> <p>Section 9.3: Extended IPv4 ACLs</p>
5.3 Configure and verify ACLs in a network environment	<p>Chapter 9: Access Control Lists</p> <p>Section 9.1: IP ACL Operation</p> <p>Section 9.2: Standard IPv4 ACLs</p>

	Section 9.3: Extended IPv4 ACLs
5.4 Identify the basic operation of NAT	Chapter 11: Network Address Translation for IPv4 Section 11.1 NAT Operation Section 11.2: Configuring NAT
5.5 Configure and verify NAT for given network requirements	Chapter 11: Network Address Translation for IPv4 Section 11.2: Configuring NAT
5.6 Configure and verify NTP as a client	Covered in another CCNA Routing and Switching course
Network Drive Security	
6.1 Configure and verify network device security features	Chapter 2: Basic Switching Concepts and Configuration Section 2.2: Switch Security: Management and Implementation Chapter 3: Implementing VLAN Security Section 3.3: VLAN Security and Design
6.2 Configure and verify Switch Port Security features	Chapter 2: Basic Switching Concepts and Configuration Section 2.2: Switch Security: Management and Implementation Chapter 3: Implementing VLAN Security Section 3.1: VLAN Segmentation Section 3.2: VLAN Implementations Section 3.3: VLAN Security and Design
6.3 Configure and verify ACLs to filter network traffic	Chapter 9: Access Control Lists Section 9.2: Standard IPv4 ACLs Section 9.3: Extended IPv4 ACLs
6.4 Configure and verify ACLs to limit telnet and ssh access to the router	Chapter 9: Access Control Lists Section 9.2: Standard IPv4 ACLs
Troubleshooting	
7.1 Troubleshoot and correct common problems associated with IP addressing and host configurations	Chapter 5: Inter-VLAN Routing Section 5.2: Troubleshoot Inter-VLAN Routing Section 5.3: Layer 3 Switching
7.2 Troubleshoot and resolve VLAN problems	Chapter 2: Basic Switching Concepts and Configuration Section 2.1: Basic Switch Configuration Chapter 3: Implementing VLAN Security Section 3.2: VLAN Implementations Chapter 5: Inter-VLAN Routing Section 5.1: Inter-VLAN Routing Configuration Section 5.2: Troubleshoot Inter-VLAN Routing Section 5.3: Layer 3 Switching
7.3 Troubleshoot and resolve trunking problems on Cisco switches	Chapter 3: Implementing VLAN Security Section 3.2: VLAN Implementations Section 3.3: VLAN Security and Design Chapter 5: Inter-VLAN Routing Section 5.1: Inter-VLAN Routing Configuration Section 5.2: Troubleshoot Inter-VLAN Routing Section 5.3: Layer 3 Switching
7.4 Troubleshoot and resolve ACL issues	Chapter 9: Access Control Lists Section 9.1: IP ACL Operation

	Section 9.2: Standard IPv4 ACLs Section 9.4: Troubleshoot ACLs
7.5 Troubleshoot and resolve Layer 1 problems	Chapter 2: Basic Switching Concepts and Configuration Section 2.1: Basic Switch Configuration

Support

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