Getting Started with the ICND1 Exam

June 14, 2016
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Today’s Speakers

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Exams
200-125
100-105
200-105
Agenda

- Foundational Networking Skills
- ICND1 Topics and Preparation
- Certification and Training Resources
CCENT and CCNA Routing and Switching - Enabling Many Paths

Foundation for Certifications

R&S Network Engineer

Network Design

CCDA → CCDP → CCDE

CCENT → CCNA R&S → CCNP R&S → CCIE R&S

Wireless Specialist

CCNA Wireless

CCNA Security

CCNA Industrial
### Networking Infrastructure, a Key Factor

#### 800,000+
**Networking Jobs**
U.S. in 2015

#### 96,600
**New Positions**
To Be Added in U.S. by 2020

#### 31%
**Job Growth**
Projected in U.S. by 2024
CCNA Routing and Switching – Certification Exam Transition

Path(s) to Certification

Existing Exams

CCNA
Cisco Certified Network Associate
(Exam #200-120)

ICND1
Interconnecting Cisco Networking Devices Part 1
(Exam #100-101)

New Exams

CCNA
Cisco Certified Network Associate
(Exam #200-125)

ICND2
Interconnecting Cisco Networking Devices Part 2
(Exam #200-120)

ICND2
Interconnecting Cisco Networking Devices Part 2
(Exam #200-105)

ICND1
Interconnecting Cisco Networking Devices Part 1
(Exam #100-101)

No prerequisites

https://learningnetwork.cisco.com/community/learning_center/certification_exam_topics
A Deeper Look at CCENT Technology

New ICND1 100-105 Topics

Moved/Expanded from ICND2 to ICND1

ICND1 100-105: Many Oldies but Goodies
A Deeper Look at the RIPv2 Exam Topic

3.7 Configure, verify, and troubleshoot RIPv2 for IPv4 (excluding authentication, filtering, manual summarization, redistribution)
RIPv2 Configuration
RIPv2 Configuration

Example 1: R1 Config
1. router rip
2. version 2
3. no auto-summary
4. network 192.0.1.0
5. network 10.0.0.0

Example 2: R2 Config
1. router rip
2. version 2
3. no auto-summary
4. network 192.0.1.0
5. network 20.0.0.0
6. !
RIPv2 Configuration

Example 1: R1 Config
1. router rip
2. version 2
3. no auto-summary
4. network 192.0.1.0
5. network 10.0.0.0

Example 2: R2 Config
1. router rip
2. version 2
3. no auto-summary
4. network 192.0.1.0
5. network 20.0.0.0
6. !
RIPv2 Configuration

**Example 1: R1 Config**

1. router rip
2. version 2
3. no auto-summary
4. network 192.0.1.0
5. network 10.0.0.0

**Example 2: R2 Config**

1. router rip
2. version 2
3. no auto-summary
4. network 192.0.1.0
5. network 20.0.0.0
6. !
Deeper Look at Host and Floating Routes

3.6 Configure, verify, and troubleshoot IPv4 and IPv6 static routing

3.6.a Default route
3.6.b Network route
3.6.c Host route
3.6.d Floating static
Host Routes (on Router R1)

ipv6 route 2000::102/128 3000:1:2::2 100
ipv6 route 2000::104/128 3000:1:4::2 110
ipv6 route 2000::/64 3000:1:3::2 40
If Only These Three Routes…

ipv6 route 2000::102/128 3000:1:2::2 100
ipv6 route 2000::104/128 3000:1:4::2 110
ipv6 route 2000::/64 3000:1:3::2 40

Next-Hop Router for Packets Sent to:
PC1?
PC2?
PC3?
PC4?
What if We Added The Fourth Route?

ipv6 route 2000::102/128 3000:1:2::2 100
ipv6 route 2000::104/128 3000:1:4::2 110
ipv6 route 2000::/64 3000:1:3::2 40
ipv6 route 2000::/64 3000:1:4::2 30

Next-Hop Router for Packets Sent to:
PC1?
PC2?
PC3?
PC4?
New ICND1 100-105 Topics - Paraphrased

- LAN Design and Architecture
- LLDP
- Topologies
- Devices: Firewall, Wireless LAN Controller, Access Point
- Host and default routes
- IPv4 multicast and IPv6 anycast
- TCP vs. UDP
- IPv6 SLAAC
- DNS and DHCP connectivity troubleshooting
Placing LAN Switches in a Building

Building

3rd Floor

PC3

PC2

PC1

2nd Floor

SW3

SW2

SW1

SWD

1st Floor

To Rest of Enterprise Network
Collapsed Core Design: Three Buildings

Access Switches Connect to Users and Things

Distribution Switches Connect Access Switches and Buildings
Three-Tier Core Design: Three Buildings

Access Switches Connect to Users and Things

Distribution Switches Connect Access Switches and Buildings

Core Switches for Central Connections to Each Building
A Deeper Look at CCENT Technology

New ICND1 100-105 Topics

Moved/Expanded from ICND2 to ICND1

ICND1 100-105: Many Oldies but Goodies
ICND1 Management Topic Move/Adds

Old ICND2 Mgt.

New ICND1 Mgt.

New Mgt. Topics
Management Topic Move/Add (Literal Wording)

• 5.1 Configure and verify device-monitoring using syslog *
• 5.2 Configure and verify device management
  • 5.2.a Backup and restore device configuration
  • 5.2.b Using Cisco Discovery Protocol and LLDP for device discovery
  • 5.2.c Licensing
  • 5.2.d Logging
  • 5.2.e Timezone
  • 5.2.f Loopback
Management Topic Move/Adds

• 5.5 Perform device maintenance
  • 5.5.a Cisco IOS upgrades and recovery (SCP, FTP, TFTP, and MD5 verify)
  • 5.5.b Password recovery and configuration register
  • 5.5.c File system management
MD5 Verify

R2# verify /md5 flash0:c2900-universalk9-mz.SPA.154-3.M3.bin a79e325e6c498b70829d4d b0afba5041

MD5 of flash0:c2900-universalk9-mz.SPA.154-3.M3.bin Done!

Verified (flash0:c2900-universalk9-mz.SPA.154-3.M3.bin) = a79e325e6c498b70829d4d b0afba5041
Logging to Console and Terminal
Log Message on Exit from Config Mode

P1-R1# conf t
Enter configuration commands, one per line. End with CNTL/Z.
P1-R1(config)#
P1-R1(config)# ^Z
P1-R1#
*Jun 3 16:30:01.120: %SYS-5-CONFIG_I: Configured from console by console

P1-R1# show logging
.
.
*Jun 3 16:30:01.120: %SYS-5-CONFIG_I: Configured from console by console
Toggling Console Logging Off

P1-R1# **conf t**
Enter configuration commands, one per line. End with CNTL/Z.
P1-R1(config)# **no logging console**
P1-R1(config)# ^Z
P1-R1#
P1-R1#

P1-R1# **show logging**
.
.
*Jun 3 16:30:08.006: %SYS-5-LOG CONFIG CHANGE: Console logging disabled
*Jun 3 16:30:09.298: %SYS-5-CONFIG I: Configured from console by console
Toggling Console Logging On

P1-R1# conf t
Enter configuration commands, one per line. End with CNTL/Z.
P1-R1(config)# logging console
*Jun  3  16:30:19.410: %SYS-5-LOG_CONFIG_CHANGE: Console logging: level debugging, xml disabled, filtering disabled

P1-R1(config)# ^Z
P1-R1#
*Jun  3  16:30:23.310: %SYS-5-CONFIG_I: Configured from console by console

P1-R1# show logging
.
.
*Jun  3  16:30:19.410: %SYS-5-LOG_CONFIG_CHANGE: Console logging: level debugging, xml disabled, filtering disabled
*Jun  3  16:30:23.310: %SYS-5-CONFIG_I: Configured from console by console
A Deeper Look at CCENT Technology

New ICND1 100-105 Topics

Moved/Expanded from ICND2 to ICND1

ICND1 100-105: Many Oldies but Goodies
Still Here: Layer 2 Ethernet Depth

• 2.1 Describe and verify switching concepts
  • 2.1.a MAC learning and aging
  • 2.1.b Frame switching
  • 2.1.c Frame flooding
  • 2.1.d MAC address table

• 2.2 Interpret Ethernet frame format

• 2.3 Troubleshoot interface and cable issues (collisions, errors, duplex, speed)
• 2.4 Configure, verify, and troubleshoot **VLANs** (normal range) spanning multiple switches
  - 2.4.a Access ports (data and voice)
  - 2.4.b Default VLAN

• 2.5 Configure, verify, and troubleshoot **interswitch connectivity**
  - 2.5.a Trunk ports
  - 2.5.b 802.1Q
  - 2.5.c Native VLAN
2.7 Configure, verify, and troubleshoot port security

- 2.7.a Static
- 2.7.b Dynamic
- 2.7.c Sticky
- 2.7.d Max MAC addresses
- 2.7.e Violation actions
- 2.7.f Err-disable recovery
Still Here: IPv4 Addressing and Subnetting

• 1.8 Configure, verify, and troubleshoot IPv4 addressing and subnetting

• 1.9 Compare and contrast IPv4 address types
  • 1.9.a Unicast
  • 1.9.b Broadcast
  • 1.9.c Multicast

• 1.10 Describe the need for private IPv4 addressing
• 3.1 Describe the routing concepts
  • 3.1.a Packet handling along the path through a network
  • 3.1.b Forwarding decision based on route lookup
  • 3.1.c Frame rewrite

• 3.2 Interpret the components of routing table
  • 3.2.a Prefix
  • 3.2.b Network mask
  • 3.2.c Next hop
  • 3.2.d Routing protocol code
  • 3.2.e Administrative distance
  • 3.2.f Metric
  • 3.2.g Gateway of last resort
Still Here: Static Routes, ROAS

- 3.3 Describe how a routing table is populated by different routing information sources
  - 3.3.a Admin distance
- 3.4 Configure, verify, and troubleshoot inter-VLAN routing
  - 3.4.a Router on a stick
- 3.5 Compare and contrast static routing and dynamic routing
- 3.6 Configure, verify, and troubleshoot IPv4 and IPv6 static routing
  - 3.6.a Default route
  - 3.6.b Network route
  - 3.6.c Host route
  - 3.6.d Floating static
Still Here: Lots More!

- Many More Topics are Still in ICND1 (Just Not Listed Here)
- www.cisco.com/go/rs-track
Exam Preparation
Opinions and Advice

Opinion: How to Prepare for Configure, Verify, Troubleshoot Progression

The Big Choice: Should You Use the 1-exam or 2-exam Path to CCNA R&S?
Topics Now with a Troubleshooting Verb

• Most CLI exam topics now list “configure, verify, and troubleshoot” verbs
  • Some are old ICND1 topics
  • Some are migrations from ICND2 to ICND1
  • Some are totally new to CCNA R&S

• Two practical points in the webinar:
  1. Briefly listing the nouns on the topics that are upgraded to include a troubleshoot verb
  2. Tips to prepare for troubleshooting performance level
Nouns with New Troubleshooting Verb (1/4)

• 2.4 Configure, verify, and **troubleshoot** VLANs (normal range) spanning multiple switches
  • 2.4.a Access ports (data and voice)
  • 2.4.b Default VLAN

• 2.5 Configure, verify, and **troubleshoot** interswitch connectivity
  • 2.5.a Trunk ports
  • 2.5.b 802.1Q
  • 2.5.c Native VLAN
Nouns with New Troubleshooting Verb (2/4)

- 2.7 Configure, verify, and troubleshoot port security
  - 2.7.a Static
  - 2.7.b Dynamic
  - 2.7.c Sticky
  - 2.7.d Max MAC addresses

- 3.4 Configure, verify, and troubleshoot inter-VLAN routing
  - 3.4.a Router on a stick
Nouns with New Troubleshooting Verb (3/4)

• 3.6 Configure, verify, and **troubleshoot** IPv4 and IPv6 static routing
  • 3.6.a Default route
  • 3.6.b Network route
  • 3.6.c Host route
  • 3.6.d Floating static

• 4.6 Configure, verify, and **troubleshoot** IPv4 standard numbered and named access list for routed interfaces
Nouns with New Troubleshooting Verb (4/4)

- 4.7 Configure, verify, and **troubleshoot** inside source NAT
  - 4.7.a Static
  - 4.7.b Pool
  - 4.7.c PAT

- 5.4 Configure, verify, and **troubleshoot** basic **device hardening**
  - 5.4.a Local authentication
  - 5.4.b Secure password
  - 5.4.c Access to device
    - 5.4.c. (i) Source address
    - 5.4.c. (ii) Telnet/SSH
  - 5.4.d Login banner
Opinions on Prep for Config/Verify/Troubleshoot

1. Master Configuration
   • Verify: Unlocks the meaning of show commands
   • Tshoot: the #1 Key to Troubleshooting

2. Master Verification
   • Config: Simlets and show running-config
   • Tshoot: show commands reveal status (working vs. non-working)
   • Brain Filtering: see next slides

3. Understand 1-Mistake Troubleshooting
   • Config: Misconfigure one thing vs. working config
   • Verify: Confirm new status values and config
   • Config: memorize lists of common misconfigured items
Your Brain: Before Understanding the Topic

sw1# show interfaces gigabit 0/1 switchport
Name: G10/1
Switchport: Enabled
Administrative Mode: dynamic auto
Operational Mode: static access
Operational Trunking Encapsulation: dot1q
Negotiation of Trunking: On
Trunking Mode VLAN: 1 (default)
Administrative Native Mode VLAN: 1 (default)
Voice VLAN: none

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Brain: After Understanding, Before Practice

SW1# `show interfaces gigabit 0/1 switchport`
Name: Gi0/1
Switchport: Enabled
Administrative Mode: dynamic auto
Operational Mode: static access
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: native
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Administrative Native VLAN tagging: enabled
Voice VLAN: none
SW1# show interfaces gigabit 0/1 switchport
Name: Gi0/1
Switchport: Enabled
Administrative Mode: dynamic auto
Operational Mode: static access
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: native
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Administrative Native VLAN tagging: enabled
Voice VLAN: none
Opinion: How to Prepare for Configure, Verify, Troubleshoot Progression

The Big Choice: Should You Use the 1-exam or 2-exam Path to CCNA R&S?
Two Exam Vs. One Exam

New CCNA
200-125

New ICND1
100-105

New ICND2
200-105
Reasons to Choose: Who You Are

2-Exam
- Average Test Takers
- Not Doing the Job Yet

1-Exam
- Above Average Test Takers
- Doing the Job Already
Reasons to Choose: Exam/Study

2-Exam

- Breaks up Content (Study Effort)
- Take 1st Cisco Exam Sooner
- May be cost neutral *

1-Exam

- Less Total Time if You Pass
- Long Trip to Exam Center
Reasons to Choose: Program Options

2-Exam

- Flexibility: CCENT as Prereq
- Obtain CCENT Certification

1-Exam

- None
Study Effort ICND1: Old Vs. New

- Removals are Generally Small:
  - OSPF Vs. RIPv2: even swap for study time
  - Other Removals are few and small (router internals, switch internals)

- Other Adds are Individually Small, but Can Add Up
  - New Small Topics: LAN design, LLDP, devices, host/floating static, IPv4 multicast, IPv6 anycast, TCP vs. UDP, IPv6 SLAAC, DNS and DHCP Troubleshooting
  - Moved/enhanced Management from ICND2 to ICND1

- Net Impact on Study: a Little Bigger
Study Effort ICND2: Old Vs. New

- Removals Total a Large Amount
  - Frame Relay (Big)
  - Management topics moved to ICND1 (Big)
  - GLBP, VRRP (Medium)

- Additions of New Topics Total a Larger Amount than the Removed Topics

- Net Impact on Study: a Little Bigger
Quick Rundown of Some New ICND2 Topics

- Conceptual Additions (Various Sizes)
  - QoS Tools
  - SDN architectures
  - Cloud Impacts on Enterprise Networks
  - WAN: MPLS and Metro Ethernet
  - DMVPN
  - WAN Topologies
  - DHCP Snooping
  - Switch Stacking and Chassis Aggregation

- Config/Verify/Tshoot Additions (Various Sizes)
  - VTP
  - eBGP
  - IPv6 ACLs
  - DMVPN Concepts
  - GRE
  - L3 EtherChannels
  - Multilink PPP
CCNA Routing and Switching v3
- Certification Exam and Training Resources

• New exams → available through authorized Pearson VUE Testing Centers

• Enhanced Learning Solutions with lab-centric framework delivered by → Authorized Cisco Learning Partners

• Cisco Learning Network (Cisco Learning Labs and subscription based training options)

• Cisco Press → Official Certification Guides + more

• Cisco Networking Academy → Global

• Packet Tracer → Available to all
Summary

- Download the free sample chapter from the 100-105 Official Cert Guide
- Register and attend the next webinar in this series
- Register for the Cisco Learning Network – It’s free
- Bookmark the CCNA Routing and Switching Overview page: www.cisco.com/go/ccna
Questions

• Find Wendell online:
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Exams
200-125, 100-105
200-105 (2016)