

## Lab 9.1.1 Organizing CCENT Objectives by OSI Layer

### Objectives

- Organize the CCENT objectives by which layer or layers they address.

### Background / Preparation

In this lab, you associate the objectives of the CCENT exam with the corresponding OSI model layers. Some objectives fall into more than one category.

**Note:** The CCENT exam is the same as the ICND1 exam. The ICND1 and ICND2 exams together equal the CCNA exam.

This lab requires a computer with browser and Internet access.

### Task 1: Access the CCENT Exam Web Page

**Note:** Steps 1 and 2 use the 640-822 ICND1 exam page that is accessed via the CCNA Prep Center website and requires a Cisco.com login account. You can also go directly to the 640-822 ICND1 exam page located at [http://www.cisco.com/web/learning/le3/current\\_exams/640-822.html](http://www.cisco.com/web/learning/le3/current_exams/640-822.html), which does not require a login.

#### Step 1: Log in to the Cisco CCNA Prep Center website.

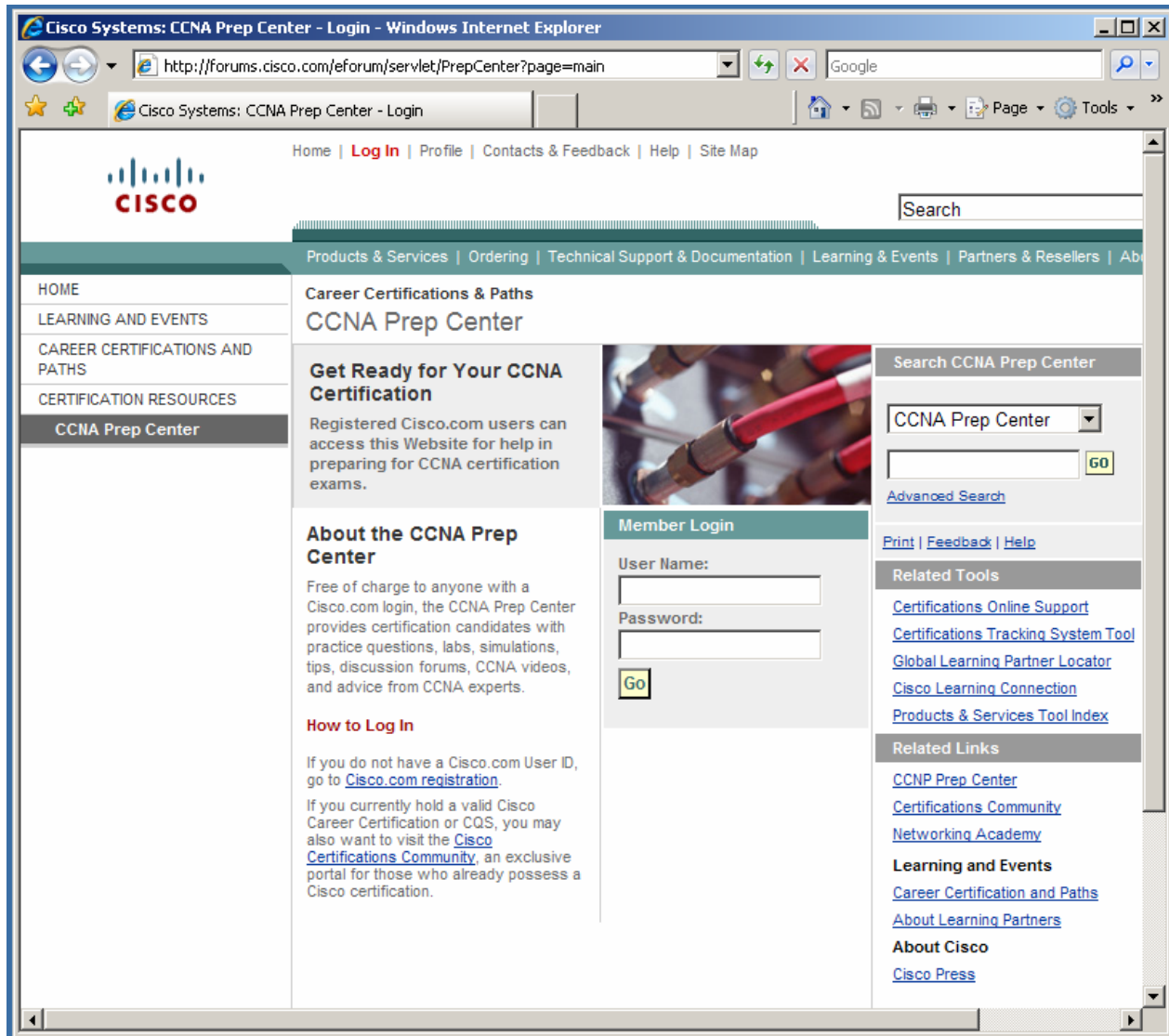
Registered Cisco.com users can access this website for help in preparing for CCNA certification exams.

<http://forums.cisco.com/eforum/servlet/PrepCenter?page=main>

In the **Member Login** area, enter your Cisco.com username and password, and click **Go**. If you do not have a Cisco.com user ID, click on the link for Cisco.com Registration in the **How to Log In** area.

## CCNA Discovery

### Working at a Small-to-Medium Business or ISP



#### Step 2: View the ICND1/CCENT exam description and exam topics.

- a. From the **CCNA Prep Center** main screen, click the **CCNA Paths** button.

The screenshot shows the CCNA Prep Center website. At the top is a navigation bar with links: Products & Services, Ordering, Technical Support & Documentation, Learning & Events, Partners & Resellers, and About Cisco. Below this is a header for 'Career Certifications & Paths' and 'CCNA Prep Center'. A main content area on the left titled 'Get Ready for Your CCNA and CCENT Certification' describes the resources available. To its right is an image of network cables. Further right is a search bar with 'CCNA Prep Center' entered and a 'GO' button. Below the search bar are links for 'Advanced Search', 'Print | Feedback | Help', and 'Related Tools'. The 'Related Tools' section includes links to 'Certifications Online Support', 'Certifications Tracking System', 'Global Learning Partner Locator', 'Cisco Learning Connection', and 'Products & Services Tool Index'. Below this is a 'Related Links' section with links to 'CCNP Prep Center', 'Certifications Community', 'Networking Academy', 'Learning and Events', 'Career Certification and Paths', 'About Learning Partners', 'About Cisco', and 'Cisco Press'. A horizontal menu below the main content area includes 'Overview', 'CCNA Paths', 'Exam Study', 'CCNA TV', 'Discussions', 'News and Information', and 'Games'. The 'Overview' section is active, showing 'Planning Your CCNA Preparation' with a paragraph about the new curriculum and links for 'CCNA Paths' and 'Exam Study'. The 'Featured Content' section on the right highlights 'CCNP TV: Implementing MSTP' with a date, time, and links to 'Register Now' and 'Watch the Show'. Below that is a survey result snippet: 'How long did it take you to get Cisco Certified? You answered our survey. Click here to View the results.'

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## Career Certifications & Paths

### CCNA Prep Center

**Get Ready for Your CCNA and CCENT Certification**

CCNA Prep Center provides certification candidates with resources including practice questions, labs, simulations, instructional videos, tips, advice, success stories and peer-discussion forums. The CCNA Prep Center also allows learners easy access to information and formal training from Cisco Learning Partners.

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**Overview** | **CCNA Paths** | **Exam Study** | **CCNA TV** | **Discussions** | **News and Information** | **Games**

#### Planning Your CCNA Preparation

We are very excited to announce the new CCNA curriculum. Please be patient as we roll out new content to align with the new CCNA curriculum. Within the next few months we will post new material and slowly archive old content. We will introduce new material and resources which align to the revised CCNA curriculum and the CCENT certification. Check back frequently to see what we have added.

[CCNA Paths](#)  
CCNA Certification Paths, My Certification History, Pre-Assessment Exam and Exam Registration.

[Exam Study](#)  
Study Tips, Practice Questions, Remote Labs, Simulations and more.

#### Featured Content

**CCNP TV: Implementing MSTP**  
Feb 28th, 2008  
8:00 AM PST (11:00 AM EST and 16:00 GMT)  
[Register Now](#)  
[Watch the Show](#)

**How long did it take you to get Cisco Certified?**  
You answered our survey. Click here to [View the results](#).

- b. In the next screen, click the **640-822 ICND1** exam link. The **640-822 ICND1** screen appears. It contains a description of the exam and a list of exam topics.

**Note:** The following screen shot only shows a portion of the exam topics.

## 640-822 ICND1

### Interconnecting Cisco Networking Devices Part 1

**Exam Number:** 640-822 ICND1  
**Associated Certifications:** CCENT and CCNA  
**Duration:** 90 Minutes (50-60 questions)  
**Available Languages:** English  
**Click Here to Register:** [Pearson VUE](#)  
**Exam Policies:** [Read current policies and requirements](#)  
**Exam Tutorial:** [Review type of exam questions](#)

[Exam Description](#) [Exam Topics](#) [Recommended Training](#) [Additional Resources](#)

#### Exam Description

The 640-822 Interconnecting Cisco Networking Devices Part 1 (ICND1) is the exam associated with the Cisco Certified Entry Network Technician certification and a tangible first step in achieving the Cisco Certified Network Associate certification. Candidates can prepare for this exam by taking the Interconnecting Cisco Networking Devices Part 1 (ICND1) v1.0 course. This exam tests a candidate's knowledge and skills required to successfully install, operate, and troubleshoot a small branch office network. The exam includes topics on networking fundamentals; connecting to a WAN; basic security and wireless concepts; routing and switching fundamentals; the TCP/IP and OSI models; IP addressing; WAN technologies; operating and configuring IOS devices; configuring RIPv2, static and default routing; implementing NAT and DHCP; and configuring simple networks.

#### Exam Topics

The following topics are general guidelines for the content likely to be included on the Interconnecting Cisco Networking Devices Part 1 exam. However, other related topics may also appear on any specific delivery of the exam. In order to better reflect the contents of the exam and for clarity purposes, the guidelines below may change at any time without notice.

##### Describe the operation of data networks.

- Describe the purpose and functions of various network devices
- Select the components required to meet a given network specification
- Use the OSI and TCP/IP models and their associated protocols to explain how data flows in a network

c. What are some of the main topic areas covered?

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## Task 2: Review the OSI Model Layers

### Step 1: Review the OSI model layer names and functions.

In the table below, indicate the name of the OSI layer that is associated with each layer number, and the functions, terminology, and protocols related to each layer.

#### OSI Model Table

Layer Number	Layer Name	Functions / Terminology	Technologies / Protocols
7			
6			
5			
4			
3			
2			
1			

**Step 2: Review the exam topics associated with OSI layers.**

The following worksheets address all the exam topics listed on the Cisco.com website for the ICND1/ CCENT exam. Place an X under each layer of the OSI model that most closely relates to the topic or objective. Some objectives may apply to more than one layer.

**a. Describe the operation of data networks.**

640-822 CCENT Topic / Objective	Layer 1	Layer 2	Layer 3	Layer 4	Upper Layers
Describe the purpose and functions of various network devices					
Select the components required to meet a given network specification					
Use the OSI and TCP/IP models and their associated protocols to explain how data flows in a network					
Describe common networking applications including web applications					
Describe the purpose and basic operation of the protocols in the OSI and TCP models					
Describe the impact of applications (Voice Over IP and Video Over IP) on a network					
Interpret network diagrams					
Determine the path between two hosts across a network					
Describe the components required for network and Internet communications					
Identify and correct common network problems at layers 1, 2, 3 and 7 using a layered model approach					
Differentiate between LAN/WAN operation and features					

**b. Implement a small switched network.**

640-822 CCENT Topic / Objective	Layer 1	Layer 2	Layer 3	Layer 4	Upper Layers
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Select the appropriate media, cables, ports, and connectors to connect switches to other network devices and hosts					
Explain the technology and media access control method for Ethernet technologies					
Explain network segmentation and basic traffic management concepts					
Explain the operation of Cisco switches and basic switching concepts					
Perform, save, and verify initial switch configuration tasks, including remote access management					
Verify network status and switch operation using basic utilities, including ping, traceroute, Telnet, SSH, ARP, ipconfig, and show and debug commands					
Implement and verify basic security for a switch (port security, deactivate ports)					
Identify, prescribe, and resolve common switched-network media issues, configuration issues, auto-negotiation, and switch hardware failures					

**c. Implement an IP addressing scheme and IP services to meet network requirements for a small branch office.**

640-822 CCENT Topic / Objective	Layer 1	Layer 2	Layer 3	Layer 4	Upper Layers
Describe the need and role of addressing in a network; create and apply an addressing scheme to a network					
Assign and verify valid IP addresses to hosts, servers, and networking devices in a LAN environment					
Explain the basic uses and operation of NAT in a small network connecting to one ISP					
Describe and verify DNS operation					
Describe the operation and benefits of using private and public IP addressing					
Enable NAT for a small network with a single ISP and connection using SDM, and verify operation using the CLI and ping					
Configure, verify, and troubleshoot DHCP and DNS operation on a router, using the CLI and SDM					
Implement static and dynamic addressing services for hosts in a LAN environment					
Identify and correct IP addressing issues					

**d. Implement a small routed network.**

640-822 CCENT Topic / Objective	Layer 1	Layer 2	Layer 3	Layer 4	Upper Layers
Describe basic routing concepts, including packet forwarding and the router lookup process)					
Describe the operation of Cisco routers, including					

the router bootup process, POST, router components					
Select the appropriate media, cables, ports, and connectors to connect routers to other network devices and hosts					
Configure, verify, and troubleshoot RIPv2					
Access and utilize the router CLI to set basic parameters					
Connect, configure, and verify operation status of a device interface					
Verify device configuration and network connectivity using ping, traceroute, Telnet, SSH, and other utilities					
Perform and verify routing configuration tasks for a static or default route given specific routing requirements					
Manage Cisco IOS configuration files, including saving, editing, upgrading, restoring					
Manage the Cisco IOS software					
Implement password and physical security					
Verify network status and router operation using basic utilities, including ping, traceroute, Telnet, SSH, ARP, ipconfig, and show and debug commands					

**e. Explain and select the appropriate administrative tasks required for a WLAN.**

640-822 CCENT Topic / Objective	Layer 1	Layer 2	Layer 3	Layer 4	Upper Layers
Describe standards associated with wireless media, including IEEE 802.11, ITU/FCC					
Identify and describe the purpose of the components in a small wireless network, including SSID, BSS, ESS					
Identify the basic parameters to configure on a wireless network to ensure that devices connect to the correct access point					
Compare and contrast wireless security features and capabilities of WPA security, including open, WEP, WPA-1/2					
Identify common issues when implementing wireless networks					

**f. Identify security threats to a network and describe general methods to mitigate those threats.**

640-822 CCENT Topic / Objective	Layer 1	Layer 2	Layer 3	Layer 4	Upper Layers
Explain today's increasing network security threats and the need to implement a comprehensive security policy to mitigate the threats					
Explain general methods to mitigate common security threats to network devices, hosts, and applications					
Describe the functions of common security					

appliances and applications					
Describe security recommended practices, including initial steps to secure network devices					

**g. Implement and verify WAN links.**

640-822 CCENT Topic / Objective	Layer 1	Layer 2	Layer 3	Layer 4	Upper Layers
Describe different methods for connecting to a WAN					
Configure and verify a basic WAN serial connection					

### Task 3: Reflection

Why is it useful to categorize the exam topics by the OSI layers with which they are associated?

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