

Scope and Sequence

CCNA Discovery v4.0

*The course objectives and outline of the final two CCNA Discovery courses, *Introducing Routing and Switching in the Enterprise* and *Designing and Supporting Computer Networks*, are subject to change since they are still under development. The English versions of those two courses are scheduled to be available in the November–December 2007 timeframe.*

Target Audience

CCNA Discovery is primarily designed for students within the Cisco Networking Academy® who are looking for career-oriented, IT-skills instruction or a quick path to job entry and career exploration.

Prerequisites

The Cisco CCNA® Discovery curriculum is composed of four courses:

- Networking for Home and Small Businesses
- Working at a Small-to-Medium Business or ISP
- Introducing Routing and Switching in the Enterprise
- Designing and Supporting Computer Networks

Networking for Home and Small Businesses is the first course and has no prerequisites. It is a prerequisite for the other three courses.

The courses should be taken sequentially.

Target Certifications

The CCNA Discovery curriculum prepares students for two different Cisco certification exams.

After completing the first two courses of CCNA Discovery, *Networking for Home and Small Businesses* and *Working at a Small-to-Medium Business or ISP*, a student has the option to take the CCENT™ (Cisco Certified Entry Network Technician) certification exam. CCENT certifies the practical skills required for entry-level IT positions. In addition, this certification assesses a student's aptitude and competence to work in an environment that features Cisco networking devices and software.

CCENT certification is an optional first step toward earning Cisco CCNA® network associate certification, the foundation level certification for networking careers. After completing all four CCNA Discovery courses, students will be prepared for the industry standard CCNA certification exam.

Curriculum Description

This curriculum presents basic networking education to equip students with knowledge and skills that can be applied toward entry-level careers in IT networking and CCENT or CCNA certification. CCNA Discovery is a blended curriculum with both online and classroom learning.

CCNA Discovery has the following features:

- Designed for students with basic PC skills
- Can be delivered as an independent curriculum or integrated into broader courses of study at secondary schools, technical schools, colleges, and universities
- Offers a hands-on, career-oriented approach to learning networking that emphasizes practical experience
- Maps more directly to everyday experiences with networks and covers key networking concepts according to the types of practical network environments students may encounter; ranging from small office or home office (SOHO) networking to more complex enterprise environments and theoretical networking models later in the curriculum
- Includes activities that emphasize networking implementation
- Teaches applied skills midway through the four-course series to help make the course content relevant, encourage students to consider additional education in IT or related fields, and help students prepare for entry-level IT careers

Curriculum Objectives

- This curriculum helps students develop the skills needed to obtain entry-level networking jobs. It provides a hands-on approach to networking education that allows students to gain practical experience early in the curriculum. Students complete engaging instructional labs that help them understand the general theory needed to build networks. The curriculum encourages students to consider additional education in IT by teaching applied skills midway through the four-course series. CCNA Discovery was designed to be delivered as an independent curriculum or integrated into broader courses of study at secondary schools, technical schools, colleges, and universities. It is for students with basic PC skills.

The goals of CCNA Discovery are as follows:

- Help students recognize the significant impact of networking on their lives
- Teach students how to build and support a home or small business network with Linksys equipment
- Instill a sense of awe in students and encourage them to learn more about how things work and to pursue careers in networking
- Prepare students for entry-level jobs in the industry by employing interactive and engaging instructional approaches that help them gain practical experience
- Teach students the fundamental concepts of networking
- Provide opportunities for extensive hands-on interaction with PC and networking equipment to prepare students for careers and certification exams
- Establish the relevancy and context of networking in our everyday lives

Upon completion of the Networking for Home and Small Businesses course, students will be able to perform the following tasks:

- Set up a personal computer system, including the operating system, interface cards, and peripheral devices.
- Plan and install a home or small business network and connect it to the Internet.
- Verify and troubleshoot network and Internet connectivity.
- Share resources such as files and printers among multiple computers.
- Recognize and mitigate security threats to a home network.
- Configure and verify common Internet applications.
- Configure basic IP services through a GUI.

Upon completion of the Working at a Small-to-Medium Business or ISP course, students will be able to perform the following tasks:

- Describe the structure of the Internet and how communications on the Internet occurs between hosts.
- Install, configure and troubleshoot Cisco IOS devices for Internet and server connectivity.
- Plan a basic wired infrastructure to support network traffic.
- Implement basic WAN connectivity using Telco services.
- Demonstrate proper disaster recovery procedures and perform server backups.
- Monitor network performance and isolate failures.
- Troubleshoot problems using an organized, layered procedure.
- Describe the OSI model and the process of encapsulation.

Upon completion of the Introducing Routing and Switching in the Enterprise course, students will be able to perform the following tasks:

- Implement a LAN for an approved network design
- Configure a switch with VLANs and inter-switch communication
- Implement access lists to permit or deny specified traffic
- Implement WAN links
- Configure routing protocols on Cisco devices
- Perform LAN, WAN, and VLAN troubleshooting using a structured methodology and the OSI model

Upon completion of the Designing and Supporting Computer Networks course, students will be able to perform the following tasks:

- Gather customer requirements
- Design a simple Internetwork using Cisco technology
- Design an IP addressing scheme to meet LAN requirements
- Create an equipment list to meet LAN design requirements
- Create and present a proposal to a customer
- Install and configure a prototype Internetwork
- Obtain and upgrade Cisco IOS® software in Cisco devices

Minimum System Requirements

Curriculum requirements:

- 1 Student PC per student; 1 local curriculum server

Lab bundle requirements for CCNA Discovery courses 1–4:

- 3 Cisco 1841 routers with Base IP IOS, 128MB DRAM, 32 MB Flash
- 3 2960 switches
- 2 Linksys wireless routers (Linksys 300N is preferred, but 54G is an alternative) or SOHO equivalent
- 1 Lab PC with Microsoft Windows 2000 Server
- 2 Lab PCs or laptops (Microsoft Windows 2000 or Windows XP)
- Assorted Ethernet and Serial cables and hubs

Equipment requirements for new Academies adopting CCNA Discovery courses 1 and 2 only:

- 3 Cisco 1841 routers with Base IP IOS, 128MB DRAM, 32 MB Flash
- 3 four-port Ethernet Switch Interface Cards for the 1841 routers
- 2 Linksys wireless routers (Linksys 300N is preferred, but 54G is an alternative) or SOHO equivalent
- 1 Lab PC with Microsoft Windows 2000 Server
- 2 Lab PCs or laptops (Microsoft Windows 2000 or Windows XP)
- Assorted Ethernet and Serial cables and hubs

Course Outline

Networking for Home and Small Businesses

This course teaches students the skills needed to obtain entry-level home network installer jobs. It also helps students develop some of the skills needed to become network technicians, computer technicians, cable installers, and help desk technicians. It provides a hands-on introduction to networking and the Internet using tools and hardware commonly found in home and small business environments. Instructors are encouraged to provide field trips and outside-the-classroom learning experiences. Labs include PC installation, Internet connectivity, wireless connectivity, file and print sharing, and the installation of game consoles, scanners, and cameras.

Prerequisites: None

1. Personal Computer Hardware

- 1.0 Chapter Introduction
- 1.1 Personal Computers and Applications
- 1.2 Types of Computers
- 1.3 Binary Representation of Data
- 1.4 Computer Components and Peripherals
- 1.5 Computer System Components

1.6 Chapter Summary

2. Operating Systems

2.0 Chapter Introduction

2.1 Choosing the Operating System

2.2 Installing the Operating System

2.3 Maintaining the Operating System

2.4 Chapter Summary

3. Connecting to the Network

3.0 Chapter Introduction

3.1 Introduction to Networking

3.2 Principles of Communication

3.3 Communicating on a Local Wired Network

3.4 Building the Access Layer of an Ethernet Network

3.5 Building the Distribution Layer of a Network

3.6 Plan and Connect a Local Network

3.7 Chapter Summary

4. Connecting to the Internet Through an ISP

4.0 Chapter Introduction

4.1 The Internet and How We Connect To It

4.2 Sending Information Across the Internet

4.3 Networking Devices in a NOC

4.4 Cables and Connectors

4.5 Working with Twisted Pair Cabling

4.6 Chapter Summary

5. Network Addressing

5.0 Chapter Introduction

5.1 IP Addresses and Subnet Masks

5.2 Types of IP Addresses

5.3 How IP Addresses are Obtained

5.4 Address Management

5.5 Chapter Summary

6. Network Services

6.0 Chapter Introduction

6.1 Client/Servers and Their Interaction

6.2 Application Protocols and Services

6.3 Layered Model and Protocols

6.4 Chapter Summary

7. Wireless Technologies

7.0 Chapter Introduction

7.1 Wireless Technology

7.2 Wireless LANs

7.3 Security Considerations on a Wireless LAN

7.4 Configuring an Integrated AP and Wireless Client

7.5 Chapter Summary

8. Basic Security

8.0 Chapter Introduction

8.1 Networking Threats

8.2 Methods of Attack

8.3 Security Policy

8.4 Using Firewalls

8.5 Chapter Summary

9. Troubleshooting Your Network

9.0 Chapter Introduction

9.1 Troubleshooting Process

9.2 Troubleshooting Issues

9.3 Common Issues

9.4 Troubleshooting and the Help Desk

9.5 Chapter Summary

Working at a Small-to-Medium Business or ISP

This course prepares students for jobs as network technicians. It also helps students develop additional skills required for computer technicians and help desk technicians. It provides a basic overview of routing and remote access, addressing, and security. It also familiarizes students with servers that provide e-mail services, Web space, and authenticated access. Students also learn about soft skills required for help desk and customer service positions. Network monitoring and basic troubleshooting skills are taught in context.

Prerequisites: Networking for Home and Small Businesses

1. The Internet and Its Uses

- 1.0 Chapter Introduction
- 1.1 What is the Internet?
- 1.2 Internet Service Providers
- 1.3 ISP Connectivity
- 1.4 Chapter Summary

2. Help Desk

- 2.0 Chapter Introduction
- 2.1 Help Desk Technicians
- 2.2 OSI Model
- 2.3 ISP Troubleshooting
- 2.4 Chapter Summary

3. Planning a Network Upgrade

- 3.0 Chapter Introduction
- 3.1 Common Issues
- 3.2 Planning the Network Upgrade
- 3.3 Purchasing and Maintaining Equipment
- 3.4 Chapter Summary

4. Planning the Addressing Structure

- 4.0 Chapter Introduction
- 4.1 IP Addressing in the LAN
- 4.2 NAT and PAT
- 4.3 Chapter Summary

5. Configuring Network Devices

- 5.0 Chapter Introduction
- 5.1 Initial ISR Router Configuration
- 5.2 Configuring an ISR with SDM
- 5.3 Configuring a Router Using IOS CLI
- 5.4 Initial Cisco 2960 Switch Configuration
- 5.5 Connecting the CPE to the ISP
- 5.6 Chapter Summary

6. Routing

- 6.0 Chapter Introduction
- 6.1 Enabling Routing Protocols
- 6.2 Exterior Routing Protocols
- 6.3 Chapter Summary

7. ISP Services

- 7.0 Chapter Introduction
- 7.1 Introducing ISP Services
- 7.2 Protocols That Support ISP Services
- 7.3 Domain Name Service
- 7.4 Services and Protocols
- 7.5 Chapter Summary

8. ISP Responsibility

- 8.0 Chapter Introduction
- 8.1 ISP Security Considerations
- 8.2 Security Tools
- 8.3 Monitoring and Managing the ISP
- 8.4 Backups and Disaster Recovery
- 8.5 Chapter Summary

Introducing Routing and Switching in the Enterprise

This course familiarizes students with the equipment applications and protocols installed in enterprise networks, with a focus on switched networks, IP Telephony requirements, and security. It also introduces advanced routing

protocols such as Enhanced Interior Gateway Routing Protocol (EIGRP) and Open Shortest Path First (OSPF) Protocol. Hands-on exercises include configuration, installation, and troubleshooting.

Prerequisites: Working at a Small-to-Medium Business or ISP

Preliminary chapter outline:

1. Networking in the Enterprise
2. Enterprise Network Infrastructure
3. Addressing in an Enterprise Network
4. Routing in an Enterprise Network
5. Implementing WAN Links
6. Switching in an Enterprise Network
7. Filtering Traffic Using Access Control Lists
8. Troubleshooting an Enterprise Network

Designing and Supporting Computer Networks

Learners progress through a variety of case studies and role-playing exercises, which include gathering requirements, designing basic networks, establishing proof-of-concept, and performing project management tasks. Lifecycle services; including upgrades, competitive analysis, and system integration, are presented in the context of pre-sale support.

Prerequisites: Introducing Routing and Switching in the Enterprise

Preliminary chapter outline:

1. Concepts of Network Design
2. Gathering Information from Clients
3. Impact of Various Applications on Network Design
4. IP Address Design Considerations
5. Creating a Network Design
6. Building and Testing a Prototype Network
7. Selecting Equipment and Planning for Installation



Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Europe Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: +31 0 800 020 0791
Fax: +31 0 20 357 1100

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

©2006 Cisco Systems, Inc. All rights reserved. CCVP, the Cisco logo, and the Cisco Square Bridge logo are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn is a service mark of Cisco Systems, Inc.; and Access Registrar, Aironet, BPX, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Enterprise/Solver, EtherChannel, EtherFast, EtherSwitch, Fast Step, Follow Me Browsing, FormShare, GigaDrive, GigaStack, HomeLink, Internet Quotient, IOS, IP/TV, IQ Expertise, the IQ logo, iQ Net Readiness Scorecard, iQuick Study, LightStream, Linksys, MeetingPlace, MGX, Networking Academy, Network Registrar, Packet, PIX, ProConnect, RateMUX, ScriptShare, SlideCast, SMARTnet, StackWise, The Fastest Way to Increase Your Internet Quotient, and TransPath are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0609R)