This is an overview to introduce and position the new CCNA curricula: CCNA Discovery and CCNA Exploration.

English versions of the first two courses of each curriculum will be available in the June-August 2007 timeframe. English versions of courses 3 and 4 will be available in the November-December 2007 timeframe.

<table>
<thead>
<tr>
<th>Topic:</th>
<th>Cisco Networking Academy Program – New CCNA Curricula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate for:</td>
<td>☑ Internal teams</td>
</tr>
<tr>
<td></td>
<td>☑ Academy audiences</td>
</tr>
<tr>
<td>Content valid:</td>
<td>Valid as of April 2007</td>
</tr>
<tr>
<td>Additional info:</td>
<td>1. Please tailor this presentation to effectively address your presentation goals, audience, and time constraints.</td>
</tr>
<tr>
<td></td>
<td>2. Notes are provided in this presentation for key speaking points</td>
</tr>
<tr>
<td></td>
<td>3. Please refer to other curricula materials for additional information</td>
</tr>
<tr>
<td></td>
<td>4. Send any feedback to your theater Networking Academy program contacts</td>
</tr>
</tbody>
</table>
Contents

- Portfolio Evolution
- New CCNA Positioning, Features, and Benefits
- Instructor Training
- Adoption and Migration
- Scope and Sequence
- Equipment
Portfolio Evolution
How Are We Evolving the Program?

- Shift focus from program growth to student outcomes
- Develop courseware tailored to student goals
- Align skills with specific jobs in networking
Networking Academy Program “2.0” Portfolio – 18 Courses

CAREERS

Enterprise Networking

Small and Medium Business Networking

Network Installer
Basic IT Support
System Admin

FUNDAMENTALS
IT Essentials I
IT Essentials II
PNIE

CCNA Discovery
Routing, Switching, WANs, Intro to Adv Tech

CCNA Exploration
Routing, Switching, WANs, Intro to Adv Tech

CCNP
Advanced Routing
Remote Access
Multilayer Switching
Troubleshooting

Wireless

Security

Student Networking Knowledge and Skills
Current CCNA Curriculum
Instructor and Student Feedback

**Improve Student Experience**
- Promote engagement; align with student interests and capabilities
- Optimize balance of theory, practice, and application
- Accommodate different skill levels

**Improve Quality**
- Improve accuracy and flow of course content
- Ensure content is relevant and up-to-date
- Address advanced technologies

**Increase Flexibility**
- Make curricula more efficient to localize
- Facilitate curriculum delivery and class administration
- Provide high and low bandwidth delivery capabilities
New CCNA Positioning, Features, and Benefits
Two New CCNA Curricula
Both Prepare Students for CCNA Certification and Professional Careers

CCNA Discovery
Foundational Learning

- Independent curriculum or possibly integrated into broader course of study at upper-secondary institutions, career and technical schools, and colleges
- Student has basic PC usage skills

CCNA Exploration
Advanced Learning

- Part of an integrated technology curriculum or continuing education program at postsecondary institutions; typically at career and technical schools, colleges, and universities
- Student has advanced problem solving and analytical skills typically associated with degrees in math, engineering, or science
New CCNA Curricula Features and Benefits

- Motivate and engage students by matching content and teaching methodologies with student interests and goals
- Features:
  - Learning by doing
  - Updated course GUI
  - More efficient translation
  - Introduction to advanced technologies and converged networks

CCNA Discovery

- Provides a hands-on approach to networking education
- Uses step-by-step labs and teaches the general theory needed to build networks
- Engages students and allows for quick application of learned concepts
- Designed to encourage students to consider additional education in IT and help them prepare for entry-level IT careers

CCNA Exploration

- Allows students to learn skills in a more rigorous, comprehensive, theoretical, and practical way; reflective of college and university educational practices
- Offers complex and challenging hands-on labs to engage advanced learners
- Designed for students who want to pursue additional technology or engineering education while preparing for careers in IT
Skills to succeed in networking-related degree programs such as:
- Network technician
- Network administrator
- Network engineer

Skills to excel in entry-level professions such as:
- Network installer
- Network technician
- Help desk technician
- Pre-sales support
- Basic network design

Networking based on technology
Deep into protocols and theory (LAN, WAN)
Reflective of university practices and allows for integration with engineering concepts

Skills to succeed in networking-related degree programs
Skills to prepare students for a wide range of networking professions such as:
- Network technician
- Network administrator
- Network engineer

Key Factors in Obtaining Jobs: Education, Experience, and Certification
Compare current GUI
to new GUI...
What do you think of when you hear the term network? There are many types of networks in existence that you may interact with daily.

Networks provide the ability to connect people and equipment, no matter where they are in the world.

For example, in this airport scene there are multiple types of networks used. How many can you find?

Click on the items in the scene to locate the different types of networks.
New GUI Prototype Feedback
Worldwide Feedback from 415 Students and 71 Instructors

“The new curriculum was just so straightforward and the links worked so effectively; everything just seemed a lot easier for the students than the original.”
– High School Instructor, United States

“This curriculum is going to reinforce concepts much more easily. They’ll be able to read, they’ll be able to see it visually, then they’ll handle labs, and then any sort of class discussion is going to be more readily understood. I like it.”
– Secondary School Instructor, Europe

93% of instructors believe students will learn more!

CCNA Discovery Prototype Findings, January 2007
New CCNA Curricula
How Do I Choose?

• What are your students’ academic capabilities?

• What are your students’ goals?

• How will your institution integrate the new CCNA curriculum?

• Which curriculum best aligns with your teaching methodology and your students' interests?

• Is the existing CCNA v3.1 curriculum very difficult for your students in terms of theoretical topics?
How Do I Choose?

What are your students’ academic capabilities?

<table>
<thead>
<tr>
<th>CCNA Discovery</th>
<th>CCNA Exploration</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Designed for students with basic PC usage skills</td>
<td>- Designed for students with advanced problem solving and analytical skills, such as those who are pursuing degrees in engineering, math, or science</td>
</tr>
</tbody>
</table>
How Do I Choose?

What are your students’ goals?

<table>
<thead>
<tr>
<th>CCNA Discovery</th>
<th>CCNA Exploration</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Designed to make IT relevant, encourage students to consider further education in IT, and help students prepare for entry-level IT careers</td>
<td></td>
</tr>
<tr>
<td>- Prepares students for entry-level IT careers as early as the first two courses</td>
<td></td>
</tr>
<tr>
<td>- Designed for students who want to pursue additional technology or engineering educations while preparing for an IT career</td>
<td></td>
</tr>
<tr>
<td>- Prepares students for entry-level IT careers after the completion of the four-course curriculum</td>
<td></td>
</tr>
</tbody>
</table>
How Do I Choose?

How will your institution integrate the new CCNA curriculum?

<table>
<thead>
<tr>
<th>CCNA Discovery</th>
<th>CCNA Exploration</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Can be delivered as an independent, standalone curriculum, or integrated into broader courses of study at upper-secondary institutions, career and technical schools, and colleges</td>
<td>▪ Can be part of an integrated curriculum or continuing education program at post-secondary institutions such as career and technical schools, colleges, and universities</td>
</tr>
</tbody>
</table>
How Do I Choose?

Which curriculum best aligns with your teaching methodology and your students’ interests?

<table>
<thead>
<tr>
<th>CCNA Discovery</th>
<th>CCNA Exploration</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Teaches networking based on application</td>
<td>- Teaches networking based on technology concepts</td>
</tr>
<tr>
<td>- Maps more directly to everyday experiences with networks and covers key networking concepts based on the types of network environments students may encounter</td>
<td>- Allows students to learn skills in a more rigorous, comprehensive, theoretical, and practical way that is reflective of standard college and university-level educational practices</td>
</tr>
<tr>
<td>- Uses easy-to-follow labs</td>
<td>- Uses language that allows for integration with engineering concepts</td>
</tr>
<tr>
<td>- Provides general theory</td>
<td>- Includes complex and challenging hands-on labs</td>
</tr>
<tr>
<td>- Offers a career-oriented approach to learning networking</td>
<td></td>
</tr>
</tbody>
</table>
How Do I Choose?

Is the existing CCNA v3.1 curriculum very difficult for your students in terms of theoretical topics?

**CCNA Discovery**
- Yes, the current CCNA curriculum is very difficult

**CCNA Exploration**
- No, the current CCNA curriculum is just right or not challenging enough
## Feature Comparison

<table>
<thead>
<tr>
<th></th>
<th>CCNA v3.1</th>
<th>CCNA Discovery</th>
<th>CCNA Exploration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expected Student Capabilities</strong></td>
<td>Basic PC usage skills</td>
<td>Basic PC usage skills</td>
<td>Advanced problem-solving and analytical skills typically associated with students in engineering, math, or science degree programs</td>
</tr>
<tr>
<td><strong>Content</strong></td>
<td>Four courses – structured by protocols and technology</td>
<td>Four courses – structured by practical network environments PLUS: • Learning by doing • Introduction to advanced technologies • Helps prepare students for entry-level IT careers by teaching applied skills early in the curriculum</td>
<td>Four courses – structured by protocols and technologies within various topologies PLUS: • Learning by doing • Introduction to advanced technologies • Extra theory and more challenging labs</td>
</tr>
<tr>
<td><strong>Business Rules</strong></td>
<td>Required minimum of six months to complete all four courses</td>
<td>Required minimum of one year to complete all four courses</td>
<td>• Goal is to offer more relaxed business rules to reduce teaching time • Courses structured to increase flexibility and efficiency in course sequence</td>
</tr>
<tr>
<td><strong>Time to Learn</strong></td>
<td></td>
<td>70 hours per course</td>
<td></td>
</tr>
</tbody>
</table>
## CCNA Discovery
Changes Compared to Current CCNA

<table>
<thead>
<tr>
<th>CCNA v3.1</th>
<th>Curriculum Framework</th>
<th>CCNA Discovery</th>
<th>Course Content</th>
</tr>
</thead>
</table>
| CCNA 1    | Networking Basics    | Networking for Home and Small Businesses | • Introduction to networking  
• Basic cabling for SOHO  
• LAN addressing and network services  
• Basic wireless and security  
• Troubleshooting – plan/build home network |
| CCNA 2    | Routers and Routing Basics | Working at a Small-to-Medium Business or ISP | • Intro to OSI model/TCP model  
• SMB routing and switching  
• WAN technology  
• IP addressing  
• Network devices and cabling  
• Security/disaster recovery |
| CCNA 3    | Switching Basics and Intermediate Routing | Introducing Routing and Switching in the Enterprise | • Enterprise overview  
• LAN/WAN performance  
• IP addressing – VLSM and subnetting  
• Advanced switching and routing  
• EIGRP, OSPF, VLANs, VTP, Frame Relay  
• LAN, WAN, VLAN troubleshooting |
| CCNA 4    | WAN Technologies     | Designing and Supporting Computer Networks | • Design concepts and equipment selection  
• IP addressing on a LAN/WAN  
• Network design  
• Cisco device configuration upgrade  
• Stronger theoretical notion of converged networks |
## CCNA Exploration Changes Compared to Current CCNA

<table>
<thead>
<tr>
<th>CCNA v3.1</th>
<th>CCNA Exploration</th>
<th>Course Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCNA 1</td>
<td>Networking Basics</td>
<td>% content change 53%</td>
</tr>
<tr>
<td>CCNA Exploration</td>
<td>Network Fundamentals</td>
<td>• Intro to Advanced Technologies and Converged Networks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Top-Down Approach to Networking</td>
</tr>
<tr>
<td>CCNA 2</td>
<td>Routers and Routing Basics</td>
<td>% content change 9%</td>
</tr>
<tr>
<td></td>
<td>Routing Protocols and Concepts</td>
<td>• Can be taught before, with, or after</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• LAN Switching and Wireless</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Removed IGRP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Added VLSM, OSPF, EIGRP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• More challenging labs</td>
</tr>
<tr>
<td>CCNA 3</td>
<td>Switching Basics and Intermediate Routing</td>
<td>% content change 22%</td>
</tr>
<tr>
<td></td>
<td>LAN Switching and Wireless</td>
<td>• Can be taught before, with, or after</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Routing Protocols and Concepts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Added Rapid Spanning Tree protocol</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Added wireless concepts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• More challenging labs</td>
</tr>
<tr>
<td>CCNA 4</td>
<td>WAN Technologies</td>
<td>% content change 23%</td>
</tr>
<tr>
<td></td>
<td>Accessing the WAN</td>
<td>• De-emphasize ISDN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Added new WAN concepts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Added ACLs, VPN concepts</td>
</tr>
</tbody>
</table>
Articulation (course credit) agreements are generally developed at the institutional level based on existing programs and pathways.

CCNA Discovery courses 1 and 2 should enable students to earn CCNA Exploration course 1 equivalent credit.

Students who complete the following will be prepared to begin the CCNP curriculum:

- CCNA Discovery courses 1-4 or CCNA Exploration courses 1-4

An institution may choose to grant CCNA Exploration credit for students who complete the CCNA Discovery curriculum.
## Paths to Certifications and Entry-Level Careers

<table>
<thead>
<tr>
<th>CCNA Discovery</th>
<th>CCNA Exploration</th>
<th>CCNA Discovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Networking for Home and Small Businesses</td>
<td>Network Fundamentals</td>
<td>Networking for Home and Small Businesses</td>
</tr>
<tr>
<td>Working at a Small-to-Medium Business or ISP</td>
<td>Routing Protocols and Concepts</td>
<td>Working at a Small-to-Medium Business or ISP</td>
</tr>
<tr>
<td>Introducing Routing and Switching in the Enterprise</td>
<td>LAN Switching and Wireless</td>
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<tr>
<td>Designing and Supporting Computer Networks</td>
<td>Accessing the WAN</td>
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<tr>
<td></td>
<td></td>
<td>CCNA Exploration</td>
</tr>
<tr>
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<td>Routing Protocols and Concepts</td>
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<td></td>
<td>LAN Switching and Wireless</td>
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<tr>
<td></td>
<td></td>
<td>Accessing the WAN</td>
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</table>
Instructor Training
## Instructor Training

### CCNA Discovery vs. CCNA Exploration

<table>
<thead>
<tr>
<th>Current Instructor</th>
<th>CCNA Discovery</th>
<th>CCNA Exploration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional but strongly recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our goal is to offer a distance learning solution for current CCNA instructors at no extra cost*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(min. 8-10 hours per course)</td>
<td>(min. 4-8 hours per course)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>New Instructor</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>In person training required. Approximately 60-80 hours per course; similar to current CCNA v3.1</td>
<td></td>
</tr>
<tr>
<td>Costs generally range from US$50 to US$150 per day, depending on location</td>
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</tbody>
</table>

**NOTE:**
- Training Academies may offer additional training opportunities to instructors. There may be fees associated with these learning events, as determined by the training Academies. Please refer to your training Academy for exact costs.
Training Resources for Existing Instructors

Reference Materials

**Instructor Reference Guide**
- Comparison of New Curriculum with Existing Curriculum
  - New Topics
  - New Skills
  - New Equipment
- Suggestions for Use of Existing Equipment

**Interactive Course Guide**
- Key Ideas
- Teaching Goals
- Critical Concepts
- How to Teach Concepts
- Discussion Ideas
- Reflection
- Case Studies, Labs, Videos, Tools
Training Resources for New Instructors

Academy curriculum and Interactive Course Guide (ICG)
Focus on main ideas, strategies for teaching difficult concepts, and connection with real world scenarios
Interactive sessions for skills-based training
Content and Skills Exam

Traditional Face-to-Face Training
Module 3.1.2 Teaching Goals

Your Challenge As A Teacher In This Section Is To:

- Integrate the definition of a computer network into their construct of communication.
- Differentiate when a host computer is a server (for example a print server) and as a client (browsing the Internet). It can be helpful to demonstrate a personal computer serving in both roles so that students clearly understand that it is software that determines the status as a host/server.
- Clarify when a peer-to-peer network is used.
- Demonstrate the construction and ver...
Module 3.1

Big Ideas: This module presents an overview of network fundamentals including:
- Benefits of networks to small/home (SOHO) offices
- Identification of network components
- Client/server relationships
- Components/Construction of a P2P network
- Difference between logical and physical topologies

Your Challenge As A Teacher In This Section Is To:
1. Integrate the definition of a computer network into their construct of communication.
2. Differentiate when a host computer is acting as a client or server.
3. Clarify when a peer-to-peer network is an appropriate networking solution
4. Demonstrate the construction and verification of a simple P2P network

What are the Critical Concepts/Processes?
1. Identification, categorization, and role of network components (peripheral, host, network device, media).
2. Servers are computer hosts that handle network resources and provide services to clients. Clients make requests and display information received from the server.
3. Advantages and disadvantages of peer-to-peer networking.
4. Construction and verification of a peer-to-peer network.
5. Difference between logical and physical topologies:
   a. Logical topologies show how devices communicate regardless of location and do not show the devices or media that interconnect them.
   b. Physical topologies show how the devices are actually connected including the devices between them.

Misconceptions and Errors
Students may be confused that a host, such as a personal computer, can function as both a server (for example a print server) and as a client (browsing the Internet). It can be helpful to demonstrate a personal computer serving in both roles so that students clearly understand that it is software that determines the status as a host/server.

Students, who have some prior exposure to networking, may be disdainful of peer-to-peer networking as a solution. The challenge is to help these students see that peer-to-peer networks have a place in the SOHO networking.

Students are sometimes confused by the differences between the physical layout of the network and the logical path followed by packets.

How to Teach It
Introduction (Making the Topic Relevant): Do you know what a network is? A network provides the ability to
ICG Structure – Example (Cont’d)

Reflection/Integration
1. Extend the lecture/discussion on peer-to-peer and client/server networks by asking students to identify other networks they have used. These choices could include many types of networks including video game networks for both platforms (Xbox Live, PS3, Nintendo Wii, Nintendo DS) or computer based; music distribution networks (Rhapsody, Morpheus, iTunes, Kazaa, etc.); radio networks, PDA’s, and other devices that students may have familiarity in using in a networked format. Ask the students to select a network they have used to diagram their “best guess” as to the logical and physical devices (hubs, ISRs, switches, and so on) they have used.

2. After completing the client software of servers file, web, and email.
   - Saving your work from the server.
   - Checking your municipality network you use.
   - Checking your email.
   - Instant Messaging - Where are you from?
   - Retrieving a file - Where do you go?
   - Downloading a file from a server you use?

3. Peer-to-peer networking has been the core of almost all local area networks. Investigate the new features and applications, such as Corel and applications. Using the following link:
   http://www.microsoft.com/technet

Lab Practice:
1. Module 3.1.5 – Build a Simple Peer-to-Peer Network
2. File sharing: Instructor demonstrates the creation, saving and retrieval of a file, using both Windows Explorer and My Computer to demonstrate the process for saving and retrieval of a file. Then students should complete the following tasks:
   - Create a one-word file in a text editor.
   - Save the file to the host computer.
   - Save the file to the server.

If students do not have access to a network server have them assemble a simple peer-to-peer network and utilize one of the hosts as a server, the other as the client.

3. Present photographs/schematics of small home/office networks to groups of students. Ask students what they think the connections look like getting to the server, to network devices, to the Internet. Ask them to prepare both logical and physical topology “maps” of the network, remembering to use the correct terminology of hosts, peripherals, network devices, and media.

Ask the students to share their maps with the whole class explaining their decision process in drawing and labeling devices.

Version date: January 9, 2007
Editor: K. Munckaster
Training Scenarios for New CCNA Curricula

Existing Instructor

- Log into Academy Connection
- Select Academy Course Materials
- Select ICG for course
- Review Instructor Reference Guide

New Instructor

- Attend scheduled training at Training Center
- Complete course exam and skills exam

- Existing instructors will automatically be enabled to offer the new CCNA courses
- Current plan is to make optional training available for current instructors in early June
- Current plan is for new instructor training to be available in late June
Adoption & Migration
## Tools to Drive Adoption

<table>
<thead>
<tr>
<th>Currently Available</th>
<th>Planned</th>
</tr>
</thead>
<tbody>
<tr>
<td>At-a-Glance</td>
<td>Product demos</td>
</tr>
<tr>
<td>FAQs</td>
<td>Scope and sequence documents (final)</td>
</tr>
<tr>
<td>External presentation</td>
<td>Datasheets</td>
</tr>
<tr>
<td>Qualification guidelines</td>
<td>Testimonials</td>
</tr>
<tr>
<td>Scope and sequence documents (drafts)</td>
<td>Job framework information</td>
</tr>
<tr>
<td>Detailed equipment list</td>
<td></td>
</tr>
</tbody>
</table>
CCNA Discovery and CCNA Exploration Migration

- Institutions midway through delivering CCNA v3.1 should continue with the CCNA v3.1 curriculum until completion.
- Countries with translated versions of CCNA v3.1 courses can wait until a translated version of the new CCNA curricula is available, or adopt the English version.
- There are no immediate plans to retire the CCNA v3.1 curriculum; it will remain available to existing and new Academies for as long as it aligns with customer needs and certification requirements.
CCNA Discovery and CCNA Exploration Translation

- **Goals**
  - Reduced cost and time-to-market
  - Increased quality and scalability

- **Strategy**
  - Design course GUIs for translation
  - Create processes to implement translations
  - Execute trials to optimize processes

- **Timeline**
  - FY’08 translations that Cisco will manage, including roadmap for selected languages, to be announced in the June-August 2007 timeframe
Product Launch Timeline

- **New Product Announcements**
  - Nov 2006
  - Dec 2006
  - Jan 2007
  - Feb 2007
  - Mar 2007
  - May 2007

- **New CCNA Prototype Tests**
- **New CCNA Small Market Trials**

- **General Availability**
  - CCNA Discovery 3 and 4
  - CCNA Exploration 3 and 4 (English Versions)
  - Jun/Jul/Aug 2007

- **Early Adopter Feedback**
  - Nov/Dec 2007

- **New CCNA**
  - Discovery 1 and 2
  - Exploration 1 and 2
  - IT Essentials v4.0
  - CCNP 2 and 4 (English Versions)
Scope & Sequence
CCNA Discovery Course Sequence

<table>
<thead>
<tr>
<th>CCNA Discovery</th>
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<tbody>
<tr>
<td>Networking for Home and Small Businesses</td>
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<tr>
<td>Working at a Small-to-Medium Business or ISP</td>
<td></td>
</tr>
<tr>
<td>Introducing Routing and Switching in the Enterprise</td>
<td></td>
</tr>
<tr>
<td>Designing and Supporting Computer Networks</td>
<td></td>
</tr>
</tbody>
</table>

- Course Objectives
- Chapter Outlines
CCNA Discovery 1 – Networking for Home and Small Businesses Course Objectives

- Set up a personal computer 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 (files and printers) among multiple computers
- Recognize and mitigate security threats to the home network
- Configure and verify common Internet applications
- Configure basic IP services through a GUI interface
CCNA Discovery 2 – Working at a Small-to-Medium Business or ISP: Course Objectives

- Describe the structure of the Internet and how communication occurs between hosts
- Install, configure, and troubleshoot Cisco IOS devices for Internet and server connectivity
- Plan a basic wired infrastructure to support network traffic
- Configure a server to share resources and provide common Web services
- 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
CCNA Discovery 3 – Introducing Routing and Switching in the Enterprise: Course Objectives

- 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
- Configure a routing protocol on Cisco devices
- Implement WAN links
- Perform LAN, WAN, and VLAN troubleshooting using a structured methodology and the OSI model
CCNA Discovery 4 – Designing and Supporting Computer Networks: Course Objectives

- 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 IOS in Cisco devices
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<thead>
<tr>
<th>Ch</th>
<th>Networking for Home and Small Businesses</th>
<th>Working at a Small-to-Medium Business or ISP</th>
<th>Introducing Routing and Switching in the Enterprise</th>
<th>Designing and Supporting Computer Networks</th>
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<td>The Internet and Its Uses</td>
<td>Networking in the Enterprise</td>
<td>Concepts of Network Design</td>
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<td>Gathering Information from Clients</td>
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<td>Planning a Network Upgrade</td>
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<td>Impact of Various Applications on a Network Design</td>
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<td>Connecting to the Internet Using an Internet Service Provider</td>
<td>Planning the Address Structure</td>
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<td>IP Address Design Considerations</td>
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<td>Implementing WAN Links</td>
<td>Creating the Network Design</td>
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<td>Routing</td>
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<td>Building and Testing a Prototype Network</td>
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<td>Selecting Equipment and Planning for Installation</td>
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<td>Troubleshooting Your Network</td>
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</table>
CCNA Exploration

• Course Objectives
• Chapter Outlines
CCNA Exploration 1 – Network Fundamentals Course Objectives

- Explain the importance of data networks and the Internet as a platform to support business communications and everyday tasks
- Explain how communication occurs in data networks and the Internet
- Describe the devices and services that support communication across an Internetwork
- Use network protocol models to explain the layers of communications that occur in data networks
- Explain the role of protocols in data network communications
- Describe the importance of addressing and naming schemes at various layers of data networks
- Describe the protocols and services provided by the application layer in the OSI model and describe how this layer operates in simple networks
- Analyze the operations and features of the OSI model transport layer protocols and services
CCNA Exploration 1 – Course Objectives (Continued)

- Analyze the operations and feature of the OSI model network layer protocols and services and explain the fundamental concepts of routing
- Design, calculate, and apply an appropriate addressing scheme to fulfill given requirements
- Describe the operation of protocols at the OSI data link layer and how they support communications
- Explain the role of physical layer protocols and services in supporting communications across data networks
- Explain fundamental Ethernet concepts, media, services, and operation
- Employ basic cabling and network designs to connect devices for a given network requirement
- Build a simple Ethernet network using routers and switches
- Use Cisco CLI commands to perform basic router and switch configuration and verification
CCNA Exploration 2 – Routing Protocols and Concepts: Course Objectives

- Describe the purpose, nature, and operations of a router
- Explain the critical role that routers play in enabling communication across multiple networks
- Describe the purpose and nature of routing tables
- Explain how a router determines a path and switches packets
- Configure and verify router interfaces
- Describe the purpose and procedure for configuring static routes
- Describe the role of dynamic routing protocols and place these protocols in the context of modern network design
- Describe how metrics are used by routing protocols and Identify the metric types used by dynamic routing protocols
- Identify the characteristics of distance vector routing protocols
- Describe the network discovery process of distance vector routing protocols using Routing Information Protocol (RIP)
- Describe the functions, characteristics, and operation of RIPv1
CCNA Exploration 2 – Course Objectives (Continued)

- Compare and contrast classful and classless IP addressing
- Describe classful and classless routing behavior in routed networks
- Design and implement a classless IP addressing scheme for a given network
- Demonstrate comprehensive RIPv1 configuration skills
- Apply basic RIPv2 configuration commands and evaluate classless routing updates
- Describe the main features and operation of the Enhanced Interior Gateway Routing Protocol (EIGRP)
- Use advanced configuration commands with routers implementing EIGRP
- Describe the basis features and concepts of link-state routing protocols
- Describe the purpose, nature, and operation of OSPF
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<tr>
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<th>Network Fundamentals</th>
<th>Routing Protocols and Concepts</th>
<th>LAN Switching and Wireless</th>
<th>Accessing the WAN</th>
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<td>1</td>
<td>Living, Learning, Working, and Playing in a Network-Centric World</td>
<td>Introduction to Routing and Packet Forwarding</td>
<td>Ethernet Revisited</td>
<td>Managing Traffic: Access Control Lists (ACLs)</td>
</tr>
<tr>
<td>2</td>
<td>Communications with Computer Networks and the Internet</td>
<td>Static Routes</td>
<td>Switching Concepts: IOS and CDP</td>
<td>Addressing Hosts: NAT, DHCP, and IPv6 Basics</td>
</tr>
<tr>
<td>3</td>
<td>OSI Application Layer</td>
<td>Introduction to Dynamic Routing Protocols</td>
<td>Inside the Switch</td>
<td>Security</td>
</tr>
<tr>
<td>4</td>
<td>OSI Transport Layer</td>
<td>Distance Vector Routing Protocols</td>
<td>Campus Network Design</td>
<td>Introduction to WAN Technologies</td>
</tr>
<tr>
<td>5</td>
<td>OSI Network Layer and Routing</td>
<td>RIP v1: A Distance Vector, Classful Routing Protocol</td>
<td>Basic Switch Configuration</td>
<td>WAN Devices and Connections: CSU, Cable Modem, and DSL Modem</td>
</tr>
<tr>
<td>6</td>
<td>Addressing the Network - IPv4</td>
<td>Classless Routing: VLSM and CIDR</td>
<td>VLANs &amp; IP Telephony Basics</td>
<td>Connecting to the WAN: Leased Lines, Cable, and DSL</td>
</tr>
<tr>
<td>7</td>
<td>OSI Data Link Layer</td>
<td>Classless Routing Using RIPv2</td>
<td>Rapid Spanning Tree Protocol</td>
<td>PPP, PPPoE</td>
</tr>
<tr>
<td>8</td>
<td>OSI Physical Layer</td>
<td>The Routing Table: A Closer Look</td>
<td>Trunking and VTP</td>
<td>Frame Relay</td>
</tr>
<tr>
<td>9</td>
<td>Ethernet</td>
<td>EIGRP: A Distance Vector, Classless Routing Protocol</td>
<td>Inter-VLAN Routing</td>
<td>QoS Considerations</td>
</tr>
<tr>
<td>10</td>
<td>Planning and Cabling Your Network</td>
<td>Link-State Routing Protocols</td>
<td>Wireless Networks and Mobility</td>
<td>Tunneling Concepts &amp; VPN Basics</td>
</tr>
<tr>
<td>11</td>
<td>Configuring and Testing Your Network</td>
<td>Single Area OSPF: A Link State, Classless Routing Protocol</td>
<td>Campus LANs</td>
<td>Capstone: Converged Networks</td>
</tr>
</tbody>
</table>
CCNA Exploration: Flexibility in Course Sequence

- Network Fundamentals
- Routing Protocols and Concepts
- LAN Switching and Wireless
- Accessing the WAN

- Network Fundamentals
- LAN Switching and Wireless
- Routing Protocols and Concepts
- Accessing the WAN
Equipment
CCNA Discovery and CCNA Exploration Equipment

- The minimum required equipment bundle is the same for CCNA Discovery and CCNA Exploration.
  - The equipment list has been reduced from current CCNA requirements due to the enhanced simulation tools and flexibility that are built into the new curricula
  - A best practice guide on utilizing different equipment and classroom management scenarios will be published prior to product availability

- Equipment required for current Academies migrating to new curricula:
  - 2 Linksys wireless routers (Linksys 300N is preferred; 54G is an alternative) or SOHO equivalent
New Academy Equipment

New Academy adopting CCNA Discovery 1-4 or CCNA Exploration 1-4:

- Minimum required equipment bundle:
  - 3 Cisco 1841 routers with Base IP IOS, 128 MB DRAM, 32 MB Flash
  - 3 2960 switches
  - 2 Linksys wireless routers (Linksys 300N is preferred, but 54G is an alternative) or SOHO equivalent
  - Serial cables

New Academy adopting only CCNA Discovery 1 and 2:

- Minimum required equipment bundle:
  - 3 Cisco 1841 routers with Base IP IOS, 128 MB 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

In addition, a typical lab configuration includes the following:

- 1 local Web server to host curriculum
- 3 desktop PCs
- Ethernet cables
- Cable-making and cable-testing equipment
PC Requirements

- 1 Lab PC with Microsoft Windows 2000 server
- 2 Lab PCs or laptops (Win 2000 or Windows XP)
## PC Requirements - Recommended

<table>
<thead>
<tr>
<th>Current</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU</strong></td>
<td>Intel Pentium III or higher processor</td>
</tr>
<tr>
<td><strong>Operating System</strong></td>
<td>Windows 2000 or Windows XP</td>
</tr>
<tr>
<td><strong>RAM</strong></td>
<td>128 MB Installed RAM</td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td>1024 x 768 Resolution</td>
</tr>
<tr>
<td><strong>Screen Resolution</strong></td>
<td>1024 x 768</td>
</tr>
<tr>
<td><strong>Browsers</strong></td>
<td>Netscape 7.0x and 7.1, Internet Explorer 6.0 or 5.5 SP 2</td>
</tr>
<tr>
<td><strong>Flash</strong></td>
<td>Macromedia Flash Player 7.0 or higher</td>
</tr>
<tr>
<td><strong>Drivers</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>Mouse, speakers, headphones, and sound card</td>
</tr>
<tr>
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</tr>
</tbody>
</table>

**Note:** Current version of Packet Tracer does not run in Native mode in MacOS or Linux. Windows Emulators are required.
The 1841 Router simulates only the ISP connectivity, no student configuration of the 1841. Topology represents an ISP, with a small office and a home office customer. Multiple pods will be connected serially using the serial ports on the 1841.

Recommended six students per pod.
Students will configure RIPv2 routing in a three-router topology. There is no specific configuration of the 2960 switches, other than basic setup. Topology will be reconfigured during the course.

Recommended six to eight students per pod.
CCNA Discovery 3 and 4: Lab Topology (Preliminary)

CCNA Discovery 3: Introducing Routing and Switching in the Enterprise and CCNA Discovery 4: Designing and Supporting Computer Networks, will use the same pod.

It represents a main enterprise site and two branch offices.

Recommended eight students per pod.
CCNA Exploration 1 – Network Fundamentals
Lab Topology (Preliminary)

Network Fundamentals
CCNA Exploration 1: Primary Hands-On Lab Pod
-- Shared "Model" Internet Connection and LAN
-- Isolated from Any Production Networks
-- <= 4 students per pod of 2 PCs

CCNA Exploration Server
-- Cisco provides a bootable CD
-- Low performance requirements
-- Web, DNS, email, chat, ftp, etc.

CCNA Exploration 1
Secondary Lab Pod
-- used in chapters 10 & 11
-- students use this topology to plan, build, configure, and test
-- <= 4 students per pod of 1 router, 1 switch, PCs

Pod 1  ... Pod N

Router 1 "ISP"

Switch 1 "Central"

Pod 1  Pod 2  ... Pod N

PC 1A  PC 1B  PC 2A  PC 2B

Labs include:
-- installing application clients
-- using Web, DNS, email, chat, ftp, etc.
-- using Wireshark to sniff traffic
-- network testing

PC 2A

PC 1A

PC 1B

Labs Include:
-- planning
-- building
-- configuring
-- testing
-- basic IOS
Routing Protocols and Concepts
CCNA Exploration 2: Hands-On Lab Pod

- "Model" Routing Network
- Isolated from Any Production Networks
- NETLAB "friendly"
- ≤ 6 students per pod of 3 routers
LAN Switching and Wireless
CCNA Exploration 3: Hands-On Lab Topology

- 3 IOS switch, 1 IOS router, 1 Linksys router core
- ≤ 10 students per pod of 3 IOS switches, 2 Linksys routers

Pod 1

SW1 Central

R1

Central Server

SW2 West

Fa0/1

SW3 East

Linksys 1

Linksys 2
Accessing the WAN CCNA Exploration 4: Hands-On Lab Topology

- Core is 3 1841 Routers/WIC-2Ts
- Server from Cisco-provided bootable CD
- link with CSU’s, extra WIC will be optional
- perhaps an alternate, optional, Adtran-based topology
- <= 8 students per pod of 3 IOS routers, 1 Linksys router