



# New Topics in IT Essentials: PC Hardware and Software, v.4.0



**Developed by:**

**Karen Alderson, Deanne Cranford-Wesley, PhD, Kathee Douglas, Jim Bergquist, Lisa Oyler and Jeff Banhart**

Cisco | Networking Academy®  
Mind Wide Open™



# Your Presenters

## Saratoga Springs:

- Karen Alderson, Technical Manager, Cisco Networking Academy

[kalderso@cisco.com](mailto:kalderso@cisco.com)

- Deanne Cranford- Wesley, PhD, Associate Professor, Davenport University, Detroit, MI

[Deanne.Cranford@davenport.edu](mailto:Deanne.Cranford@davenport.edu)



# Your Presenters

## Portland:

- Kathee Douglas, Instructor, Herndon Career Center, Raytown, MO

[Katherine.Douglas@raytownschools.org](mailto:Katherine.Douglas@raytownschools.org)

- Jim Bergquist, Program Coordinator, CATC at Lakes Country Service Cooperative, Fergus Falls, MN

[jbergquist@lcsc.org](mailto:jbergquist@lcsc.org)



# Your Presenters

## Little Rock:

- Lisa Oyler, Instructor, Summit Technology Academy, Lee's Summit, MO  
[Lisa.Oyler@leesummit.k12.mo.us](mailto:Lisa.Oyler@leesummit.k12.mo.us)
- Jeff Banhart, Instructor, Summit Technology Academy, Lee's Summit, MO  
[banhart@gmail.com](mailto:banhart@gmail.com)



# Scope of This Session

- Introduce and highlight some new or significantly changed topics in IT Essentials: PC Hardware and Software, version 4.0
- Give overview of 2006 CompTIA A+® exam
- Suggest exam prep tips
- Suggest resources
- Provide take-home activities
- Demonstrate an activity

# Overview of 2006 CompTIA A+ Exam



# Overview of 2006 CompTIA A+ Exam

What's new to the certification process?

- **One** required exam
  - A+® Essentials (220-601)
- **At least one** of the following options:
  - IT Technician (220-602)
  - Remote Support Technician (220-603)
  - Depot Technician (220-604)
- Each option has a different certification designation

Source: <http://certification.comptia.org/a/default.aspx>

# A+ Certification Options

CompTIA A+  
Essentials

+

CompTIA A+  
220-602



## Technical Role Examples

IT Technician  
Enterprise Technician  
PC Technician  
Desktop Support Technician  
Field Technician  
PC Support Specialist

## Non-Technical Role Examples

Student  
Sales  
SMB Office Mgr.

CompTIA A+  
220-603



## Remote Support Technician

Remote Support Technician  
Help Desk Technician  
Call Center Technician

CompTIA A+  
220-604



## Depot Technician

Depot Technician  
Bench Technician



# CompTIA A+ 220-601 Exam Essentials

Questions: 100, Time-Limit: 90 Minutes, Passing Score: 675

Domain	Percentage of Examination
1.0 Personal Computer Components	21%
2.0 Laptop and Portable Devices	11%
3.0 Operating Systems	21%
<b>4.0 Printers and Scanners</b>	<b>9%</b>
<b>5.0 Networks</b>	<b>12%</b>
<b>6.0 Security</b>	<b>11%</b>
7.0 Safety and Environmental Issues	10%
<b>8.0 Communication and Professionalism</b>	<b>5%</b>
<b>Total</b>	<b>100%</b>

Areas in **red** are covered in this session

Source: CompTIA A+ Essentials 2006 Examination Objectives

# CompTIA A+ 220-602 Exam

## IT Technician

Questions: 90, Time-Limit: 90 Minutes, Passing Score: 700

Domain	Percentage of Examination
1.0 Personal Computer Components	18%
2.0 Laptop and Portable Devices	9%
3.0 Operating Systems	20%
<b>4.0 Printers and Scanners</b>	<b>14%</b>
<b>5.0 Networks</b>	<b>11%</b>
<b>6.0 Security</b>	<b>8%</b>
7.0 Safety and Environmental Issues	5%
<b>8.0 Communication and Professionalism</b>	<b>15%</b>
<b>Total</b>	<b>100%</b>

Areas in **red** are covered in this session

Source: CompTIA A+ 220-602 2006 Examination Objectives

# CompTIA A+ 220-603 Exam

## Remote Support Technician

Questions: 90, Time-Limit: 90 Minutes, Passing Score: 700

Domain	Percentage of Examination
1.0 Personal Computer Components	15%
2.0 Operating Systems	29%
<b>3.0 Printers and Scanners</b>	<b>10%</b>
<b>4.0 Networks</b>	<b>11%</b>
<b>5.0 Security</b>	<b>15%</b>
<b>6.0 Communication and Professionalism</b>	<b>20%</b>
<b>Total</b>	<b>100%</b>

Areas in **red** are covered in this session

Source: CompTIA A+ 220-603 2006 Examination Objectives

# CompTIA A+ 220-604 Exam

## Depot Technician

Questions: 90, Time-Limit: 90 Minutes, Passing Score: 700

Domain	Percentage of Examination
1.0 Personal Computer Components	45%
2.0 Laptop and Portable Devices	20%
<b>3.0 Printers and Scanners</b>	<b>20%</b>
<b>4.0 Security</b>	<b>5%</b>
5.0 Safety and Environmental Issues	10%
<b>Total</b>	<b>100%</b>

Areas in **red** are covered in this session

Source: CompTIA A+ 220-604 2006 Examination Objectives

# CompTIA A+ Exam Prep Tips and Resources



# The A+ Exam and the New Curriculum

## A CompTIA Authorized Quality Curriculum



- CompTIA has approved ITE PC v4.0 as a **CompTIA Authorized Quality Curriculum**
- The curriculum addresses all the objectives of the four A+® exams
- The previous version of the curriculum did not have that designation
- Download the 2006 A+® Exam objectives from <http://certification.comptia.org/resources/objectives.aspx>

# The A+ Exam and the New Curriculum

## Mapping the version 4.0 curriculum to the 2006 A+ Exam

- There is not a chapter-level split of the coverage of the 601, 602, 603, and 604 exams. Portions of the coverage may appear in several different chapters
- There are four mapping documents to show the detailed mapping between the version 4.0 curriculum and exams
- These are available on the ITE PC Course Catalog page and on the resource CD
- All 16 chapters would prepare students for any of the three focus exams



# A+ Exam Prep Tips

## Going Beyond the Curriculum

- Explore CompTIA's website

Exam preparation page:

<http://certification.comptia.org/a/prepare.aspx>

- Practice exams

Take as many different practice exams as possible

Simulate testing environment—time, number of questions, etc.

Don't wait to take the exam

- Find a book or books that fit **your** learning style

More technical vs. more simplified



# A+ Exam Prep Tips

## What's on the Test?

- That's a secret, but...

More emphasis is given to story/scenario questions than on previous exams

Less emphasis on fact and figure type questions

- Check out the sample questions from CompTIA:

[http://certification.comptia.org/resources/practice\\_test.aspx](http://certification.comptia.org/resources/practice_test.aspx)



# A+ Exam Prep Tips

Preparing your students to take the test

- Create a detailed handout or presentation, including...

- Test-taking tips

- Exam cost

- How to obtain a voucher

- Specific test information, such as number of questions and amount of time allotted

- Help your students find a testing center:

- [www.vue.com](http://www.vue.com)

- [www.prometric.com](http://www.prometric.com)



# A+ Exam Prep Resources

- Cisco Press, [www.ciscopress.com](http://www.ciscopress.com)  
IT Essentials: PC Hardware and Software: Labs and Study Guide, Third Edition, Patrick Regan, ISBN-10: 1-58713-198-6
- Wiley Publishing, [www.dummies.com](http://www.dummies.com)  
A+ for dummies series of books
- Total Seminars, [www.totalsem.com](http://www.totalsem.com)  
Mike Meyers' Passport to CompTIA A+ Certification, Third Edition, Mike Meyers and Scott Jernigan, ISBN: 0-07-226308-3

# A+ Exam Prep Resources

- A+ Exams Guide, 2nd Edition, Christopher A. Crayton, ISBN 13:978-1-58450-566-2 (Course Technology Cengage Learning)

<http://www.course.com>

- Exam Cram—CompTIA A+ Prep:

<http://www.informit.com/store/product.aspx?isbn=0789735652>



# A+ Exam Prep Resources

- [www.mrfordsclass.com](http://www.mrfordsclass.com)
- [www.teachertube.com](http://www.teachertube.com)
- [http://en.wikibooks.org/wiki/A\\_Plus\\_Certification](http://en.wikibooks.org/wiki/A_Plus_Certification)
- [www.selftestsoftware.com](http://www.selftestsoftware.com)
- [www.simulationexams.com/practice-test/aplus.htm](http://www.simulationexams.com/practice-test/aplus.htm)
- [www.freepractice.com/default.htm](http://www.freepractice.com/default.htm)
- [www.cramsession.com](http://www.cramsession.com)

# Instructor Resource Guide and PowerPoints From Cisco Learning Institute

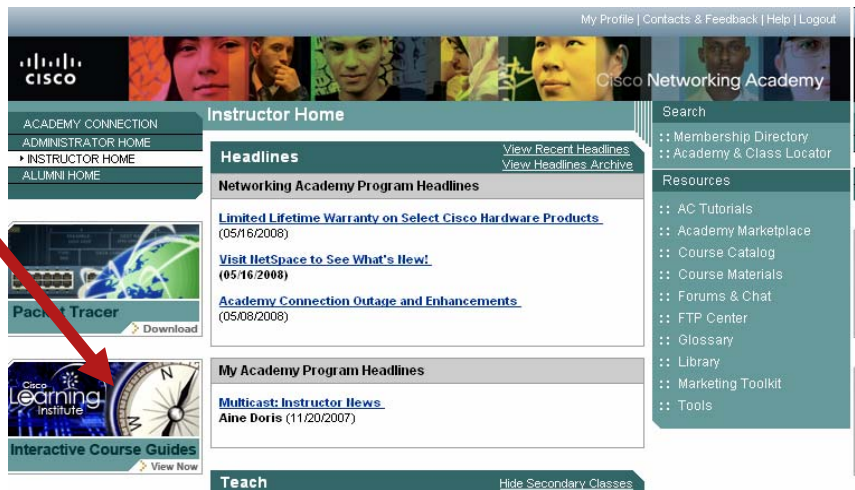


# Instructor Resource Guide (IRG)

Shows Changes Since Version 3.1.1

Start at Instructor Home Page

Curriculum PowerPoints and Speaker notes are available at this site, too



– **CCNA Exploration: LAN Switching and Wireless v4.0**

– **CCNA Exploration: Accessing the WAN v4.0**

**IT Essentials: PC Hardware and Software v4.0**

IT Essentials: PC Hardware and Software v4.0 Instructor Reference Guide

**Speaker Notes**

Chapter One - Introduction to the Personal Computer

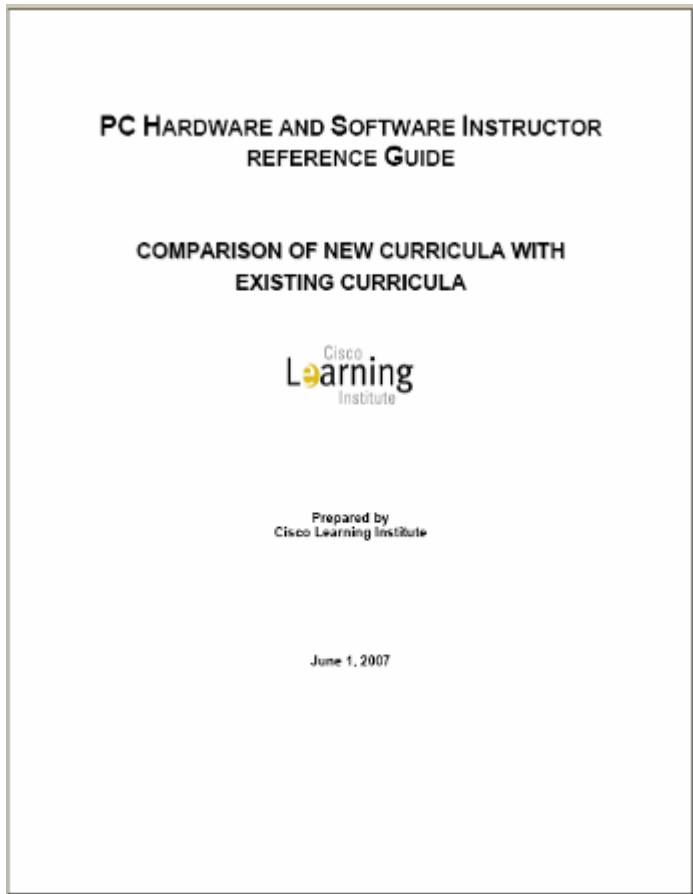
Chapter Two - Safe Lab Procedure and Tool Use

IRG

Curriculum PowerPoints

# Instructor Resource Guide

It Is Detailed—to the Curriculum Page Level



4.0
3.1.1

Cisco, Inc.  
IT ESSENTIALS: PC HARDWARE AND SOFTWARE VERSION  
4.0 INSTRUCTOR REFERENCE GUIDE

Course Outline		Ref from "old" version
	of storage drives	2.7.3 2.7.4
	1.4.7 Identify the names, purposes, and characteristics of internal cables	3.5.2 3.5.3 3.6.3 3.6.4 3.8.2
	1.5 Identify the names, purposes, and characteristics of ports and cables	2.6
	1.6 Identify the names, purposes, and characteristics of input devices	13.3.1
	1.7 Identify the names, purposes, and characteristics of output devices	13.3.2
	1.8 Explain system resources and their purposes	2.9.1 2.9.2 2.9.3 2.9.4
<b>2.0 Safe Lab Procedures and Tool Use</b>		
	2.1 Explain the purpose of safe working conditions and procedures	
	2.1.1 Identify safety procedures and potential hazards for users and technicians	1.6.1 1.6.6 12.1.4
	2.1.2 Identify safety procedures to protect equipment from damage and data from loss	12.2.1 12.2.2 12.2.3 12.2.5 12.4.5 12.4.6
	2.1.3 Identify safety procedures to protect the environment from contamination	12.1.3 12.1.5 12.1.6
	2.2 Identify tools and software used with personal computer components and their purposes	
	2.2.1 Identify hardware tools and their purpose	1.6.3 1.6.4 1.6.5 12.1.2 12.2.3 12.2.4 12.2.5
	2.2.2 Identify software tools and their purpose	1.6.3 12.4.1 12.4.3
	2.2.3 Identify organizational tools and their purpose	1.6.3 14.13.1 14.13.2
<b>2.3 Implement proper tool use</b>		
	2.3.1 Demonstrate proper use of an antistatic wrist strap	1.6.2 12.2.3
	2.3.2 Demonstrate proper use of an antistatic mat	12.2.5
	2.3.3 Demonstrate proper use of various hand tools	1.6.3 12.1.2
	2.3.4 Demonstrate proper use of cleaning materials	1.6.4 12.1.2 12.3.1 12.3.2 12.3.3
<b>3.0 Computer Assembly – Step by Step</b>		
	3.1 Open the Case	3.1.1 3.1.2
	3.2 Install the Power Supply	2.3.2 3.3.4 3.5.3 13.2.12

June 1, 2007
Page 3

# Interactive Course Guides

## From Cisco Learning Institute



# Interactive Course Guides (ICG)

## Several Types of Resources

- PowerPoints
- Key ideas
- Activities (labs)
- Teaching goals
- Critical concepts
- Preparation for class and labs
- Discussion with helpful tips and tricks
- Reflections with great self-checks
- Tools

# Interactive Course Guides

Start at Instructor Home Page Again

Viewable Online, or Downloadable

My Profile | Contacts & Feedback | Help | Logout

**INSTRUCTOR HOME**

ACADEMY CONNECTION  
ADMINISTRATOR HOME  
▶ **INSTRUCTOR HOME**  
ALUMNI HOME

**Headlines** [View Recent Headlines](#) [View Headlines Archive](#)

**Networking Academy Program Headlines**

[Limited Lifetime Warranty on Select Cisco Hardware Products](#)  
(05/16/2008)

[Visit NetSpace to See What's New!](#)  
(05/16/2008)

[Academy Connection Outage and Enhancements](#)  
(05/08/2008)

**My Academy Program Headlines**

[Multicast: Instructor News](#)  
Aine Doris (11/20/2007)

**Teach** [Hide Secondary Classes](#)

Search

- Membership Directory
- Academy & Class Locator

**Resources**

- AC Tutorials
- Academy Marketplace
- Course Catalog
- Course Materials
- Forums & Chat
- FTP Center
- Glossary
- Library
- Marketing Toolkit
- Tools

Packet Tracer [Download](#)

**Interactive Course Guides** [View Now](#)

- **CCNA Exploration: LAN Switching and Wireless v4.0**
- **CCNA Exploration: Accessing the WAN v4.0**
- **IT Essentials: PC Hardware and Software v4.0**

IT Essentials: PC Hardware and Software v4.0 Instructor Reference Guide

Chapter One - Introduction to the Personal Computer

Chapter Two - Safe Lab Procedure and Tool Use

ICG Online



ICG to Download

# Interactive Course Guides

## Sample Page

Cisco Learning Institute
Chapter 16: Advanced Security

Case Studies | Activities | Videos | Tools

### How to Teach 10

**Protection Against Malicious Software**  
In chapter 9, we talked about malicious software. It is highly recommended that the instructor begins with defining malicious software, and how computers get and cure them.

- Virus protection – anti-virus programs run in the background and monitor for suspected viruses
- Spyware protection – anti-spyware programs detect keyloggers and other malware that gather user data
- Adware protection – anti-adware programs look for programs that launch advertising popups
- Phishing protection – anti-grayware programs detect various harmful programs

**Note:** The phishing attack is getting serious



No Virus

No Spyware

No Adware

No Phishing

Key Ideas | Teaching Goals | Critical Concepts | How to Teach | Discussion | Reflection



# Printers and Scanners: “What’s New?”

## Chapters 7 and 14





# Percentage of Exam

## Printers and Scanners

- 220-601 Exam: Essentials—**9%**
- 220-602 Exam: IT Technician—**14%**
- 220-603 Exam: Remote Support Technician—**10%**
- 220-604 Exam: Depot Technician—**20%**

Source: <http://certification.comptia.org/a/default.aspx>



# Two Chapters, One Focus...Certification

- Chapter 7, Fundamental Printers and Scanners
  - Includes one installation lab for all-in-one printer
- Chapter 14, Advanced Printers and Scanners
  - Includes four labs, one worksheet, and a Remote Technician lab
- Labs to supplement the curriculum—we've included
  - Install a Plug and Play USB Printer
  - Install a TCP/IP Network Printer
  - Add a Network Printer
  - Share a Local Printer



# Types of Printers Expanded

## Version 4.0

- Laser
- Impact Printers: Daisy Wheel and Dot Matrix
- Inkjet: Thermal and Piezoelectric
- Solid-Ink
- Other types: Thermal and Dye-Sublimation

## Version 3.1.1

- Dot Matrix
- Inkjet
- Laser



# Types of Scanners Expanded

## Version 4.0

- Covers types of scanners
- Install and configuration
- Sharing scanners
- Preventive maintenance
- Troubleshooting

## Version 3.1.1

- Brief mention of scanners in Chapters 2 and 11 with regard to interface types
- Brief mention of scanners in Chapters 12 and 13 with regard to preventative maintenance and troubleshooting



# Chapter 7 and 14 ICG

Valuable resources about printers and scanners

- Scanning 101: Setting the Right Resolution
- Printer and Scanner Cleaning
- Links to:

[www.microsoft.com](http://www.microsoft.com)

[www.epson.com](http://www.epson.com)

[www.adobe.com](http://www.adobe.com)

[www.scantips.com](http://www.scantips.com)

The screenshot displays the Cisco Learning Institute software interface for Chapter 14: Advanced Printers and Scanners. The interface is divided into several sections:

- Header:** Cisco Learning Institute logo, a search bar, and the chapter title "Chapter 14: Advanced Printers and Scanners".
- Navigation:** Tabs for "Case Studies", "Activities", "Videos", and "Tools".
- Main Content:**
  - How to Teach 03:** A section titled "Safety Procedures" with text explaining safety rules for working with printers and scanners, such as using an antistatic mat and wrist strap, and avoiding hazardous materials, high voltage, and high temperatures.
  - When moving large pieces of equipment:** A list of instructions: "Lift equipment by using the strength in technician's legs and knees" and "Wear appropriate work clothes and shoes".
  - Before performing services on equipment:** A list of instructions: "Turn off printers and scanners and allow them to cool".
- Diagram:** A technical drawing of a laser printer with its top cover open. Labels point to the "Fuser Assembly" and "Corona Wire". The printer is labeled "Laser Printer".
- Footer:** A navigation bar with buttons for "Key Ideas", "Teaching Goals", "Critical Concepts", "How to Teach", "Discussion", and "Reflection", along with left and right arrow buttons and a progress indicator.

# Networking: “What’s New?”

## Chapters 8 and 15





# Percentage of Exam

## Networks

- 220-601 Exam: Essentials—**12%**
- 220-602 Exam: IT Technician—**11%**
- 220-603 Exam: Remote Support Technician—**11%**

Source: <http://certification.comptia.org/a/default.aspx>



# Chapter 8, Fundamental Networks

Objectives: **Red** Is New Since v.3.1.1

8.1 Explain the principles of networking

8.2 Describe types of networks

8.3 Describe basic networking concepts and technologies

**8.4 Describe the physical components of a network**

**8.5 Describe LAN topologies and architectures**

8.6 Identify standards organizations



# Chapter 8, Fundamental Networks

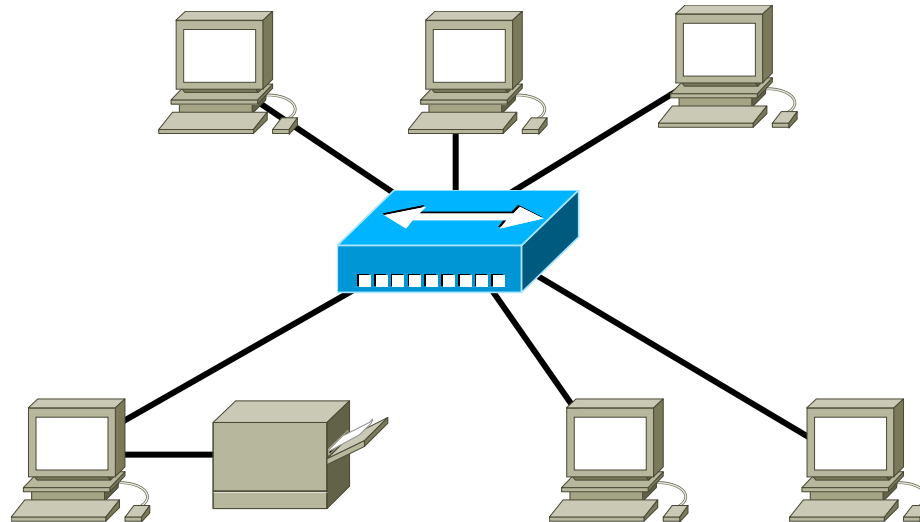
Objectives: **Red** Is New Since v.3.1.1

- 8.7 Identify Ethernet standards
- 8.8 Explain Cisco OSI and TCP/IP data models
- 8.9 Describe how to configure a NIC and a modem
- 8.10 Identify names, purposes, and characteristics of other technologies used to establish connectivity
- 8.11 Identify and apply common preventive maintenance techniques used for networks
- 8.12 Troubleshoot a network



# Comparison of Style of Coverage

Comparing the Topic “Introduction to Networks” Between Version 3.1.1 and Version 4.0 (**Next Three Slides**)

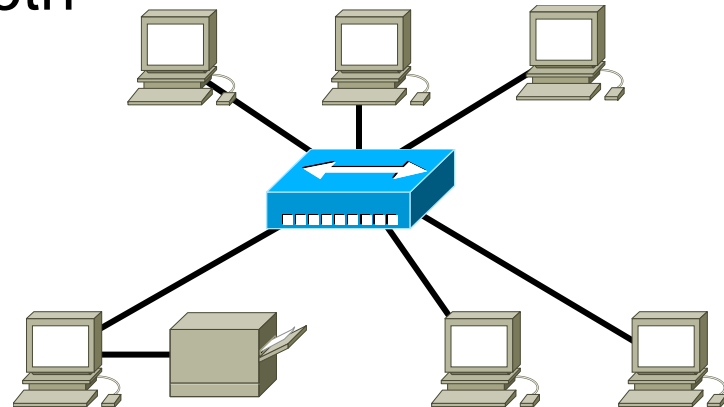




# Defining a Computer Network

This introduction is from version 3.1.1

- A computer network allows users to communicate with other users on the same network by transmitting data on the cables used to connect them
- A computer network is defined as having two or more devices (such as workstations, printers, or servers) that are linked together for the purpose of sharing information, resources, or both





# Principles of Networking

Version 4.0 uses analogies and examples of things familiar to students

- Networks are systems that are formed by links; people use different types of networks every day:

Mail delivery system

Telephone system

Public transportation system

Corporate computer network

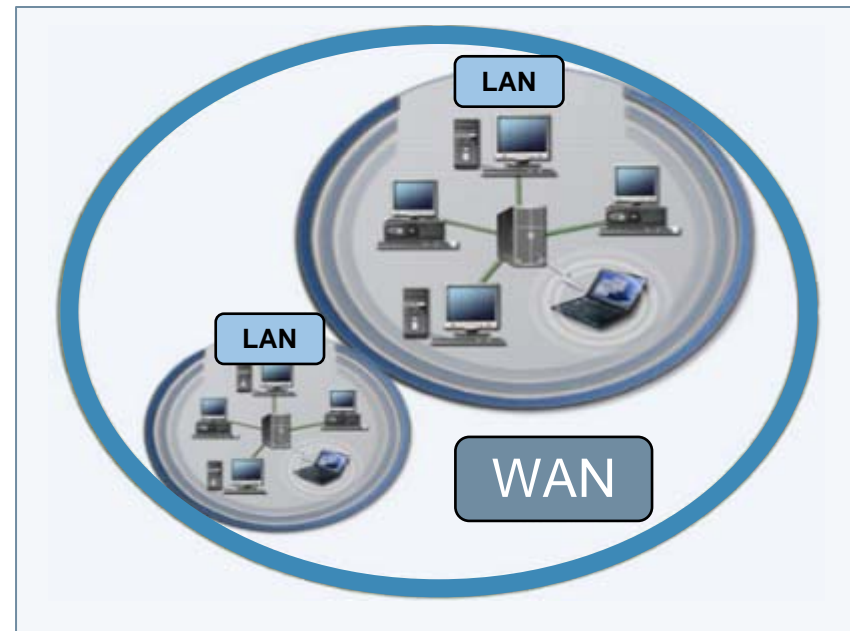




# Wide Area Network, WAN

Version 4.0 uses more graphics to illustrate the more abstract concepts

- A WAN connects LANs in geographically separated locations
- A WAN covers a much larger area than a LAN
- The Internet is a large WAN
- Telecommunications service providers (TSP) are used to interconnect these LANs at different locations



# Chapter 15, Advanced Networks

Objectives: **Red** Is New Since v.3.1.1

- 15.1 Identify potential safety hazards and implement proper safety procedures related to networks
- 15.2 Design a network based on the customer's needs
- 15.3 Determine protocols and network applications
- 15.4 Select the network device

# Chapter 15, Advanced Networks

Objectives: **Red** Is New Since v.3.1.1

- 15.5 Upgrade the customer's network
- 15.6 Describe installation, configuration and management of a simple mail server
- 15.7 Describe preventive maintenance procedures for networks
- 15.8 Troubleshoot the network



# Network Design

## Section 15.2

A network will work best if it is designed to meet the needs of your customer

- Analyze the environment
- Understand network options
- Interview the customer and other people involved
- List hardware and software to be used
- Consider future growth of the company and the network

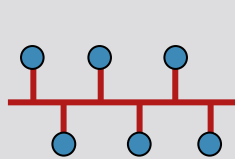




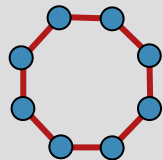
# Determine a Network Topology

## Section 15.2

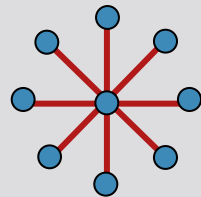
- A **site survey** is a physical inspection of the building that will help determine a basic logical topology, which is the flow of data and protocols
- Considerations for topology choice:
  - Number and location of users
  - Cable and wireless types
  - Expandability



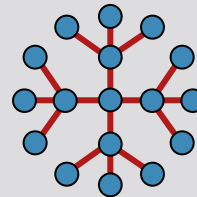
Bus Topology



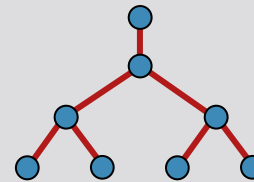
Ring Topology



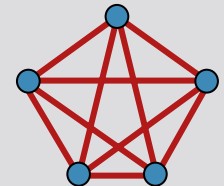
Star Topology



Extended Star Topology



Hierarchical Topology



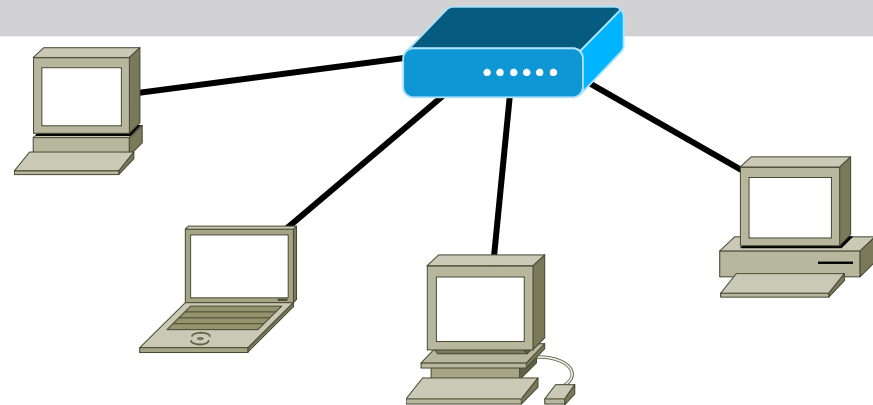
Mesh Topology



# Select Network Device

## Section 15.4

Hub	<ul style="list-style-type: none"><li>▪ Sends all traffic received out all ports</li><li>▪ Regenerates traffic that passes through it</li></ul>
Switch	<ul style="list-style-type: none"><li>▪ Filters and segments network traffic by sending only to the destination device</li></ul>
Router	<ul style="list-style-type: none"><li>▪ Connects networks together (example: connects a home network to the Internet)</li></ul>
ISP Equipment (Cable or DSL Modem)	<ul style="list-style-type: none"><li>▪ Connects customer network to ISP network</li></ul>



# Security: “What’s New?”

## Chapters 9 and 16



# Percentage of Exam

## Security

- 220-601 Exam: Essentials—**11%**
- 220-602 Exam: IT Technician—**8%**
- 220-603 Exam: Remote Support Technician—**15%**
- 220-604 Exam: Depot Technician—**5%**

Source: <http://certification.comptia.org/a/default.aspx>

# Chapter 9 Objectives

Objectives: **Red** Is New Since v.3.1.1

9.1 Explain why security is important

9.2 Describe security threats

9.3 Identify security procedures

9.4 Identify common preventive maintenance techniques for security

9.5 Troubleshooting security

# The Importance of Security



- Private information, company secrets, financial data, computer equipment, and items of national security are placed at risk if proper security procedures are not followed
- A technician's primary responsibilities include data and network security

# Security Threats

- Types of attacks to computer security

  - Physical:** Theft, damage, or destruction to computer equipment

  - Data:** Removal, corruption, denial of access, unauthorized access, or theft of information

- Potential threats to computer security

  - Internal threats:** Employees can cause a malicious threat or an accidental threat

  - External threats:** Outside users can attack in an unstructured or structured way



# Protecting Data

## Methods of Securing Data:

- Password protection
- Data encryption
- Port protection
- Data backups
- File system security





# Chapter 16 Advanced Security

Objectives: **Red** Is New Since v.3.1.1

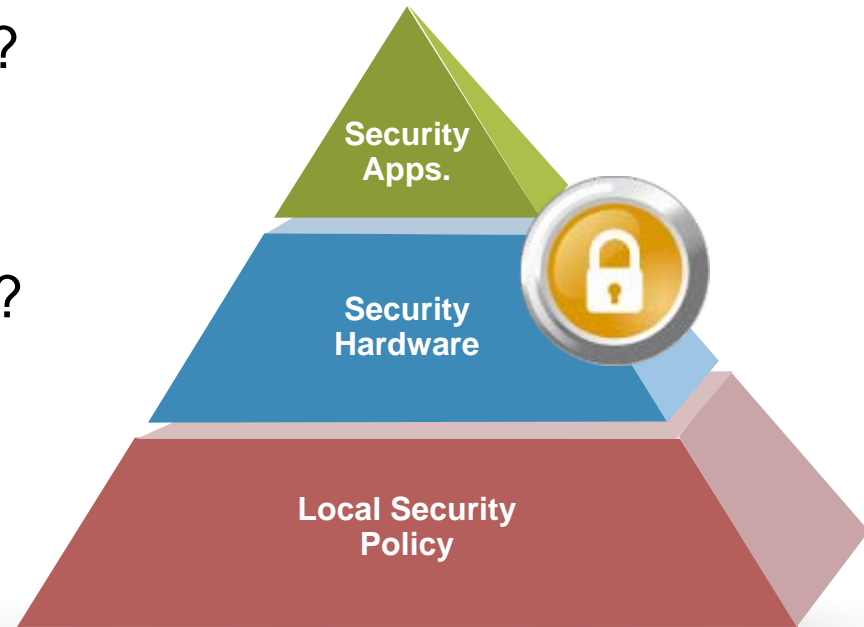
- 16.1 Outline security requirements based on customer needs
- 16.2 Select security components based on customer needs
- 16.3 Implement customer's security policy
- 16.4 Perform preventive maintenance on security
- 16.5 Troubleshooting security



# Outline Security Requirements

Security policy includes a comprehensive statement about the level of security required and how this security will be achieved

- Is the computer located at a home or a business?
- Is there full-time Internet access?
- Is the computer a laptop?

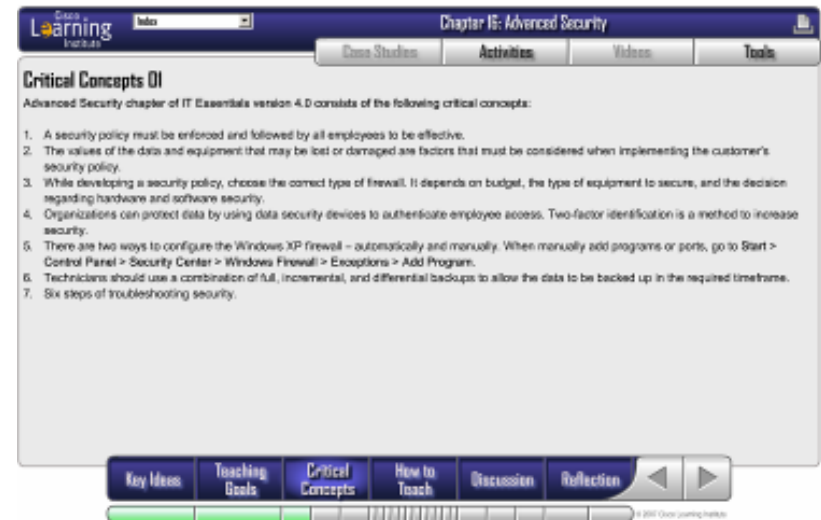




# Chapter 16 Advanced Security

Some critical concepts from the Chapter 16 ICG

- A security policy must be in place and followed by employees
- Keep in mind the value of the customer's data when implementing their security policy
- Choose the correct type of firewall
- Authenticate employee access to resources
- Use the proper combination of backup methods





# Chapter 16 Advanced Security

## Security Labs from Chapter 16

- Lab 16.5.3 Fixing a Security Problem
  - Use computer resources to correct a security problem in a wireless network
- Lab 16.5.3RT: Remote Technician: Fixing a Security Problem (two students)
  - The “Level 2 technician”, provides steps for a “customer” to follow
  - They correct a security problem in a wireless network

These Two Labs Are  
on the Resource CD





# Chapter 16 Advanced Security

## ICG Suggested Activity Chapter 16 (Critical Concepts 01): Importance of Security

The screenshot shows a software interface for 'Chapter 16: Fundamental Security'. The main content area is titled 'How to Teach 03' and includes a section on 'Importance of Security'. Below this, there is a diagram with two main boxes: 'AFTER ATTACKING BY THREATS' and 'ROLE OF TECHNICIAN'. The 'AFTER ATTACKING BY THREATS' box is divided into 'Unsecured computer' and 'Unsecured network', each with a list of consequences. The 'ROLE OF TECHNICIAN' box lists specific tasks. At the bottom of the interface is a navigation bar with buttons for 'Key Idea', 'Teaching Goals', 'Critical Concepts', 'How to Teach', 'Discussion', and 'Reflection'. A progress bar is visible below the navigation bar.

**Importance of Security**  
Start with a question related to the computer network security, such as "How many of you have received spam emails?". "Have you opened these emails and lost data?" Instructor should inform students that they will need to know how to identify computer threats and what measures to take to protect computers and information to become a computer technician. Computer technicians may lose a job for not being fully responsible for the protection of the computer and information. Technicians may have to implement a computer security policy. Lead students to discuss what computer security is and why it is necessary.

**AFTER ATTACKING BY THREATS**

- Unsecured computer**
  - Loss of productivity
  - Cost the company time and money to repair
- Unsecured network**
  - Expose confidential information
  - Reduce network resources

**ROLE OF TECHNICIAN**

- Apply software patches and update
- Install anti-virus software
- Use anti-spyware software
- Inform users on how to maintain good security practices

Discuss with Students:

- Start with a question about security
- Emphasize that security will be an important part of their job
- Ask students to outline parts of their role in security

# Additional Resources

- Ciampa, Mark. Security Guide to Network Security, 2nd., Course Technology, Ed.  
<http://www.course.com>
- Carr, H., C. Seyden. Data Communications and Network Security, 1st Ed. McGraw-Hill, 2007  
<http://www.mheducation.com>
- Mallery, John, Kelly, Patrick, McMullin, Robert. Hardening Network Security, ISBN 0-07-225703-2  
<http://www.windowsitlibrary.com/Documents/Book.cfm?DocumentID=1452>



# Preventive Maintenance and Troubleshooting: “What’s New?”

## Chapter 4





# Percentage of Exam

## Preventive Maintenance and Troubleshooting

- **Note:** There is no separate Troubleshooting domain on the A+® exam
- Some troubleshooting questions are likely in the Communication and Professionalism domain (Chapter 10), later in this presentation
- Other troubleshooting questions would be in Exam Domains 1, 2, and 3, not covered in this presentation



# Preventive Maintenance and Troubleshooting

## Instructor Resource Guide: A “Delta Document”

v.4.0				v.3.1.1
<b>4.0</b>			<b>Basics of Preventive Maintenance and Troubleshooting</b>	
	4.1		Explain the Purpose of Preventive Maintenance	12.1.1
	4.2		Identify the Steps of the Troubleshooting Process	13.1.1 14.1.1
		4.2.1	Explain the Purpose of Data Protection	
		4.2.2	Gather Data from the Customer	13.1.2 13.1.3 14.1.2 14.1.3 14.1.4 14.13.2
		4.2.3	Verify the Obvious Issues	13.1.2 13.1.3 14.1.2 14.1.3 14.1.4
		4.2.4	Try Quick Solutions First	13.1.4 13.1.5 14.1.6
		4.2.5	Gather Data from the Computer	13.1.2 13.1.3 13.1.6 13.1.7 13.1.9 13.2.2 13.2.3 13.3.1 14.1.5 14.5.1 14.5.2 14.5.3 14.6.1 14.6.2 14.13.1
		4.2.6	Evaluate the Problem and Implement the Solution	13.1.5 13.1.6
		4.2.7	Close with the Customer	13.1.7





# Preventive Maintenance and Troubleshooting

Chapter 4 Objectives: **Red** Is New Since Version 3.1.1

4.1 Explain the purpose of preventive maintenance

4.2 Identify the steps of the troubleshooting process

4.2.1 Explain the purpose of data protection

➔ 4.2.2 Gather data from the customer

4.2.3 Verify the obvious issues

4.2.4 Try quick solutions first

4.2.5 Gather data from the computer

4.2.6 Evaluate the problem and implement the solution

➔ 4.2.7 Close with the customer



# Preventive Maintenance and Troubleshooting

## New, Moved or Expanded Topics

- Chapter 4 primarily introduces the six-step process of troubleshooting. Troubleshooting examples are given at the end of most other chapters
- Most preventive maintenance content from version 3.1.1 was moved to these chapters in version 4.0:
  - Chapter 2: Safe Lab Procedures
  - Chapter 11: Advanced Personal Computers
  - Chapter 15: Advanced Networks
- Data Protection is new
- Closing with the Customer is new
- Work Orders are new



# Preventive Maintenance and Troubleshooting

## The Troubleshooting Process



1 Gather Data from the Customer

2 Verify the Obvious Issues

3 Try Quick Solutions First

4 Gather Data from the Computer

5 Evaluate the Problem and  
Implement the Solution



6 Close with the Customer

- **Note:** A variation of these six steps was in version 3.1.1, but did not emphasize communicating with the customer
- The **first and last steps** involve effectively communicating with the customer
- These steps describe following an organized and logical procedure for effective troubleshooting



# Preventive Maintenance and Troubleshooting

## Data Protection

### Verify with Customer:

- Date of the last backup
- Contents of the backup
- Data integrity of the backup
- Availability of media for data restore
- If no backup can be created, ask customer to sign a release form





# Preventive Maintenance and Troubleshooting

## Completed Work Order

- Document each solution that you try
- This is vital if the problem needs to be escalated to another technician
- Document the resolution in the Work Order, for future reference

**Note:** Students Will Benefit from Exercises that Require Completing a Work Order

Company Name: *Cisco Systems, Inc.*  
Contact: *Office Manager*  
Company Address: *170 West Tasman Drive, San Jose, CA 95134*  
Company Phone: *408-526-4000*

**Work Order**

Generating a New Ticket

### GENERATING A NEW TICKET

Category	<i>HW</i>	Issue Code		Status	<i>CLOSED</i>
Type	<i>Laptop</i>	Escalated?	<i>N</i>	Pending	
Item	<i>Laptop</i>	Business Impacting?	<i>Yes</i> <input type="radio"/> <i>No</i> <input checked="" type="radio"/>	Pending Until Date	

Summary: *Won't Boot*

Case ID: *Cisco001* Connection Type: *Wireless network connection*

Priority: *Medium* Environment: *Mobile*

User Platform: *Windows XP*

**Problem Description:**  
*User complains that the laptop won't boot up. No software was added recently. No operating system changes have been made. No peripherals have been added.*

**Problem Solution:**  
*The existing battery is three years old. The existing battery does not boot the laptop even when the AC adapter is connected. A known good battery was installed and the laptop booted and passed all POST tests. The old battery appears to have a short in it that is causing the problem. The customer was advised that the old battery will need to be replaced, preferable with a new one. Time to complete repairs: 30 minutes.*



# Preventive Maintenance and Troubleshooting

## Close with the Customer

- Discuss the solution with the customer
- Have the customer confirm that the problem is solved
- Document the process
  - Problem description
  - Solution
  - Components used
  - Time spent solving the problem



# Preventive Maintenance and Troubleshooting

## ICG Suggested Activity: Chapter 4 (Discussion 01): Open and Closed-Ended Questions

- Make two groups of students
- Student group 1 asks open-ended questions
- Student group 2 asks closed-ended questions
- The two groups compare the information they gathered
- Discuss the benefits of the two types of questions

Case Learning Institute

Chapter 4: Basics of Preventive Maintenance and Troubleshooting

Case Studies Activities Videos Tools

### Discussion 01

1. As you become more familiar with hardware and software, it is essential to develop a plan based on the needs of the equipment. Some environments, such as construction sites, may require computer equipment to be cleaned more often than other environments. High-traffic networks, such as a school network, may require additional scanning and removal of malicious software or unwanted files. Document the routine maintenance tasks that must be done to your computer equipment and the frequency of each task. This list of tasks can then be used to create a maintenance program.
2. In the student content, Windows XP Pro, hard drive diagnostics, and emergency repair disk are introduced as diagnostic software. Direct students to discuss what other diagnostic software can be used to troubleshoot computer problems.
3. Make two groups. Each group will have a customer who has a computer problem, such as, can't access the Internet. Group 1 will collect data using open-ended questions. Group 2 will collect data using closed-ended questions. Group 1 and 2 exchange the information they collect. Let students compare the information, and discuss benefits of open-ended and closed-end questions.
4. While gathering data from the computer, technicians may discover the source of the problem. If not, continue to the next step of the process. There may be additional information technicians can gather from the computer to help you to formulate a new solution. Have students research on any third-party tools that can be used to troubleshoot computers. For example, a hard drive manufacturer may provide a tool that can be used to boot the computer and diagnose problems with the hard drive when it will not boot Windows.

Key Ideas Teaching Goals Critical Concepts How to Teach Discussion Reflection

© 2007 Cisco Learning Institute

# Communication Skills: “What’s New?”

## Chapter 10





# Percentage of Exam

## Communication and Professionalism

- 220-601 Exam: Essentials—**5%**
- 220-602 Exam: IT Technician—**15%**
- 220-603 Exam: Remote Support Technician—**20%**

Source: <http://certification.comptia.org/a/default.aspx>

“In this chapter, you will learn to use good communication skills as confidently as you use a screwdriver.”

## IT Essentials: PC Hardware and Software

### Chapter 10



# Communication Skills

## “What’s New?”

- More emphasis on soft skills: Communication, professionalism and documentation
- One Worksheet in Chapter 10: Technician Resources
  - Students search the web for examples of a FAQ, blog, forum, etc.
- Role-playing exercises can help student learning
  - The Chapter 10 ICG (Reflection 01) has a role-playing exercise
  - Instructors should consider supplementing with their own activities emphasizing communication

# Communication Skills

Chapter 10 Objectives: **All New** Since Version 3.1.1

- 10.1 Explain the relationship between communication and troubleshooting
- 10.2 Describe good communication skills and professional behavior
- 10.3 Explain ethics and legal aspects of working with computer technology
- 10.4 Describe call center environment and technician responsibilities



# Communication Skills

Relationship between communication and troubleshooting

- Troubleshooting is as much about communicating with the customer as it is about knowing how to fix a computer
- A technician's professionalism and good communication skills will enhance their credibility with the customer





# Communication Skills

Professional behavior: dealing with different types of customers

- A talkative customer
- A rude customer
- An angry customer
- A knowledgeable customer
- An inexperienced customer





# Communication Skills

## Service Level Agreement

- A contract defining expectations between an organization and the service vendor to provide an agreed upon level of support
- A legal agreement that contains the responsibilities and liabilities of all parties involved

Service Level Agreement

### 4.2.4. SERVICE MONITORING

The objective of service monitoring is to effect the smooth identification (proactive) and facilitation of the resolution of incidents as they may arise during the operations. The IT services are continuously monitored by Regional IT Operations staff and system management tools based upon the Third Framework. In case of exceptions, the responsible operations staff is automatically notified.

Affected user groups will be notified (through phone or e-mail) of any incident that could affect user productivity.

In normal circumstances, the system will be attended by Regional IT operators in all working days of the serviced branches/subsidiary as defined in the SLA-addendum for each customer (see appendix 1).

Monitoring is performed by CSIT, 24 x 7 hours, including nonworking days. In case of incidents detected the responsible Regional IT staff is notified.

### 4.2.5. CONTINGENCY

A backup facility or contingency site will be employed when critical intervals are reached.

The maximum time for this facility to be operational is 24 hours. During this period affected user groups are kept informed about the progress.

Maximum loss of transactions: 10% from the last backup window.

Contingency arrangements for:

1. Hardware failures, alternative AS/400 system
2. Network related problems or site disasters, alternative location

The contingency plan maintained by Regional IT Operations defines the details of the procedures and arrangements.

### 4.2.6. MAINTENANCE WINDOWS

The customer is informed about planned maintenance activities and planned changes at least 1 week in advance. A change schedule is maintained and published to all involved countries.

Maintenance Window (defined in local time of the customer):

Period	Maintenance Window	Remarks
Monday - Friday (working day)		
Saturday	01:00 to 24:00 (local time)	Maintenance period after finishing EOD and weekend programming
Sunday	01:00 to 24:00 (local time)	

### Response Time Guarantee

[Subscribe](#) + Reserve Time Guarantee

- Within 3 business hours of receipt of your online request for a personalized rate quote, you will be contacted by phone by a personal loan consultant
- Business hours are 8:00 AM through 6:00 PM Central Time, Monday through Friday.

Page 20

# Communication Skills

## A Call Center

- Very professional and fast-paced
- A help desk system
- Customers call in and are placed on a callboard
- Available technicians take the customer calls





# Communication Skills

## Role-Playing

- Instructors should give special attention to the topic of Communication Skills; it requires a different approach to teaching
- Consider **role-playing exercises** such as ...

# Role-Playing Exercise



Hello, Mr. Perpich, how can I help you today?

**@##%&\* @\$ !!**



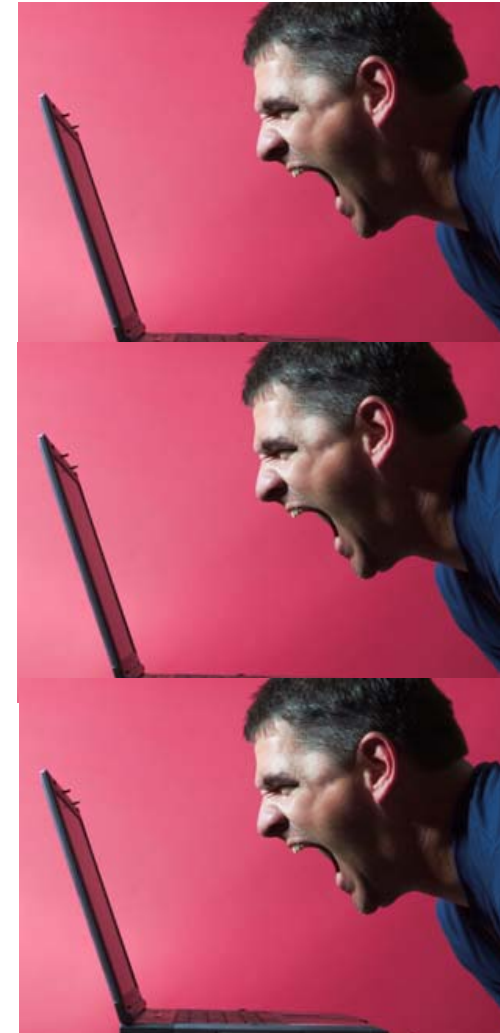
I see! I'm happy to help, if you can describe your computer's problem.

**Well, the blasted thing worked yesterday ... !!**



OK, Let's start at the beginning...

**Well, OK ...**



# Communication Skills: Role-Playing

## ICG Suggested Activity Chapter 10, (Reflection 01): In-Class Role Playing

The screenshot shows a web-based interface for a Cisco Learning Institute activity. At the top, it says 'Cisco Learning Institute' and 'Chapter 10: Communication Skills'. Below that are tabs for 'Case Studies', 'Activities', 'Videos', and 'Tools'. The main content area is titled 'Reflection 01' and contains an 'Activity' section. The activity description reads: 'In class role-playing – Customer is somewhat knowledgeable and cooperative about the computer problem that he/she is having. A point of role-playing is to Know-Relate-Understand, and determines the problem using active listening skills. Scenarios can be used by instructor or from 10.2.3 Activity: Types of Customers. The instructor should pull two best willing students to do this in front of class first, and then pair off rest of class to do on their own.' Below the text is a photograph of two women in a professional setting. One woman is wearing a headset and looking at a laptop, while the other is looking at the laptop. A blue box with the text 'Professional Behavior with the Customer' is overlaid on the image. At the bottom of the interface is a navigation bar with buttons for 'Key Ideas', 'Teaching Goals', 'Critical Concepts', 'How to Teach', 'Discussion', and 'Reflection'. There are also navigation arrows and a progress indicator.

- Have two willing students demonstrate it first
- They should practice listening and understanding, to solve a problem
- Then let the whole class try the exercise in pairs



# Activity

## Packet Tracer Demo





# Activity: Achieving Network Connectivity

Use Packet Tracer to simulate connecting two computers

- The Packet Tracer simulator is part of the CCNA curricula
- We will demonstrate the activity; You can follow with your computer if you wish
- Look for these features:
  - Intuitive operation
  - Ease of network simulation
  - Powerful inspection of packet contents

# Q and A



Thank You For Attending!

Please Fill Out an Online  
Survey at the Cyber Center



# Cisco | Networking Academy<sup>®</sup>

Mind Wide Open<sup>™</sup>



**CISCO**