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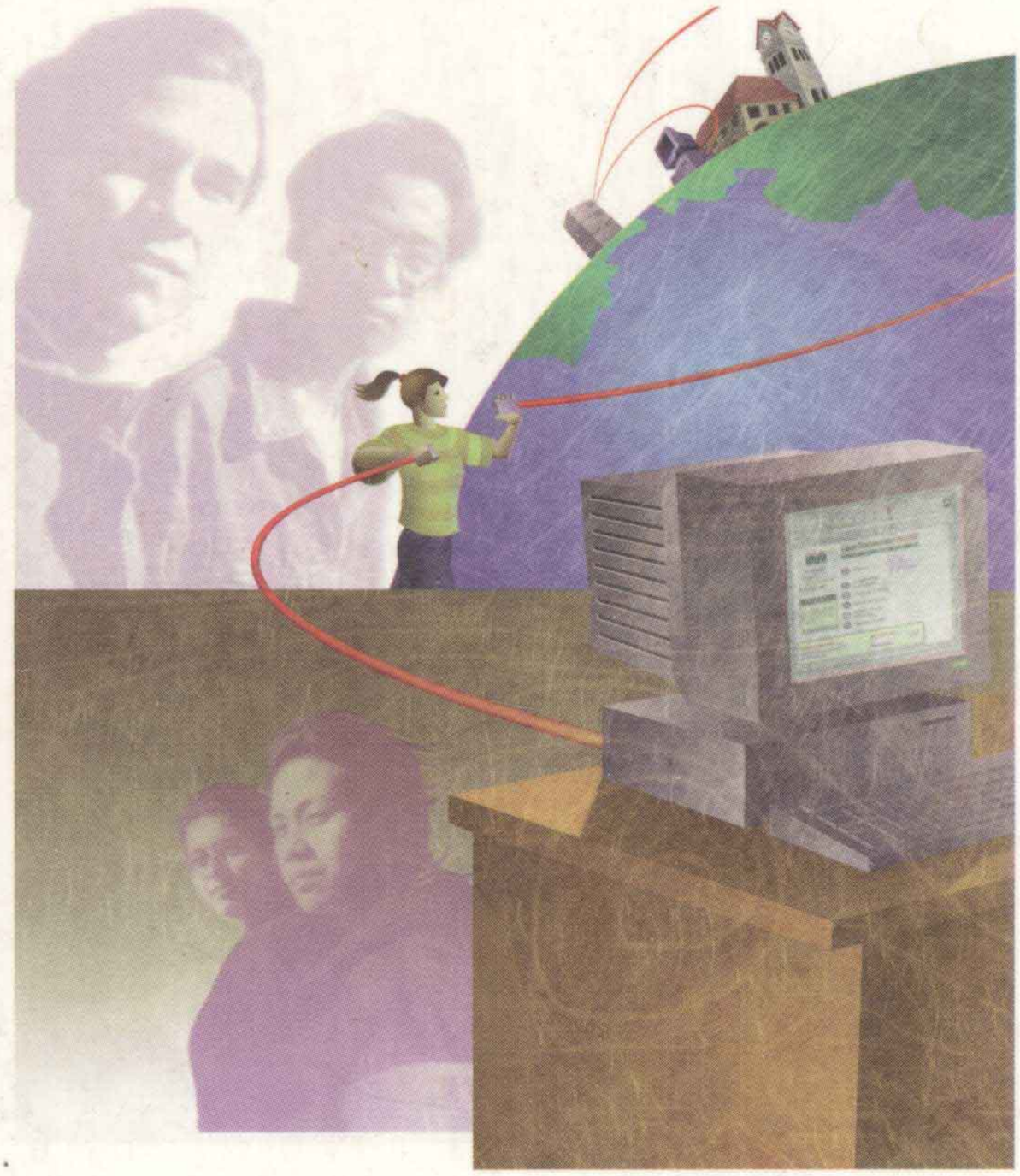

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Jim Lorenz

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Preface

This manual was developed for use with the Cisco CCNA online curriculum and the *Cisco Networking Academy Program: First-Year Companion Guide*, Revised Printing, textbook for semesters 1 and 2. These labs are based on those in the current Cisco Networking Academy Program (CNAP) with some additional information. Most of the labs are hands-on and will require access to a Cisco Router Lab or a Simulator. Additional paper-based labs, which are practice exercises for complex topics, are included to supplement the online curriculum.

All labs and exercises are structured in two parts:

1. **Overview Section**: Includes **Objectives**, **Background** information, and a **Tools/Preparation** section to help students, instructors, and lab assistants prepare for the lab. Includes references to the corresponding chapter(s) in *Cisco Networking Academy Program: First-Year Companion Guide*, Revised Printing.
2. **Worksheet Section**: Includes the steps necessary to complete the lab and progress questions.

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Semester 1 Labs

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Cisco Labs–Semester 1–Networking Fundamentals

LAB 1.1.1–PC HARDWARE–OVERVIEW

(Estimated time: 60 minutes)

Objectives:

This lab will focus on your ability to accomplish the following tasks:

- Connect peripheral components (monitor, keyboard, and so on) to the main PC system unit
- Name the typical PC components
- Identify major internal PC components and connections
- Document the configuration of a functioning PC
- Boot a system to a Windows operating system (Windows 95, 98, NT, or 2000)
- Use the Control Panel, System icon utility to gather information about the PC configuration

Background:

This lab will help you become familiar with the basic peripheral components of a PC computer system and their connections, including network attachment. You will also examine the internal PC configuration and identify major components. You will observe the boot process for the Windows operating system and use the Control Panel to find out information about the PC. Knowing the components of a PC is valuable when troubleshooting and is important to your success in the networking field. For some of you, this lab will be a review.

Tools/Preparation:

Before you begin, the teacher or lab assistant should have a typical desktop Pentium-based PC available with all peripherals such as keyboard, monitor, mouse, speakers or headphones, a network interface card (NIC), and network cable. The system unit cover should be removed, or tools should be provided to remove it. You can work individually or in teams. Before you begin this lab you should read the A+ or PC hardware maintenance training materials.

Required Resources:

- PC with monitor, keyboard, mouse, and power cords
- Windows operating system (Windows 95, 98, NT, or 2000)
- Sound card and speakers or headphones
- Network Interface Card and Cat 5 patch cable

Notes:

Cisco Labs–Semester 1–Networking Fundamentals

LAB 1.1.1–PC HARDWARE–WORKSHEET

Step 1. Examine the computer for internal and external components.

Task: Examine the computer and peripheral components both front and back.
Explanation: The components and configuration of the PC you are working with may vary from the sample answers below.

1. What is the manufacturer and model number of this computer?

Manufacturer	
Model Number	

2. Remove the PC system unit cover. List at least 8 major internal components inside the system unit (use the procedure in step 3 to find the CPU and amount of RAM).

Component Name	Manufacturer/Description/Characteristics

3. What are the major external components of the PC, including the peripherals?

Component Name	Manufacturer/Description/Characteristics

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LAB 1.1.1–PC HARDWARE–WORKSHEET

Step 2. Observe the boot process.

Task: Assemble the PC components and attach all peripherals and boot the PC. Observe the boot process.
Explanation: The computer should boot to the Windows operating system. If the computer does not boot, contact the lab assistant.

1. Observe the boot process.
   a. Did the Windows operating system boot OK? _____
   b. Could you see how much memory there was as the system was booting? _____

Step 3. General system information.

Task: Click the Start button and select Settings and Control Panel. Click the System icon and then the General tab.
Explanation: Here, we are viewing information about the computer using the operating system.

1.
   a. What is the Central Processing Unit? _____
   b. How much RAM is installed? _____

Cisco Labs–Semester 1–Networking Fundamentals

LAB 1.1.4–NIC INSTALLATION–OVERVIEW

(Estimated time: 60 minutes)

Objective:

This lab will focus on your ability to accomplish the following task:

- Demonstrate proper installation of a NIC card in a workstation

Background:

A Network Interface Card (NIC) allows your computer to connect to a local-area network (LAN) and share resources with other computers on the network, such as printers and Internet connections. The type of NIC installed depends on several factors:

1. LAN Architecture: Ethernet and Token Ring are the two primary LAN architectures in use today, with Ethernet being the most widely used. Ethernet switches are the most common choice for connecting LANs today. They are available in various speeds, including Ethernet (10 Mbps), Fast Ethernet (100 Mbps) and Gigabit Ethernet (1000 Mbps). The NIC should be capable of running at the speed of the switch and in full-duplex mode.

2. Computer Bus Type: Most NICs you can buy today will go into a PCI slot in the computer's bus. Higher-performance NICs are usually available for use in servers. ISA cards are also available.

3. Computer Operating System: The NIC and its "driver" must be compatible with the computer operating system. The NIC "driver" is software used to communicate between the NIC and the computer operating system. Operating systems include Windows, Novell, Macintosh, and UNIX.

4. Media Type: The NIC connector should match the network media. Some NICs have more than one connector type. The following table shows some types of cable and connectors.

Media (Cable) Type	**Ethernet LAN Architecture**	**Connector Type**
Unshielded Twisted Pair (UTP) Copper (for example, CAT 5)	10Base-T, 100Base-TX	RJ45 (modular 8-pin)
Coaxial (Thinnet)	10Base-2	BNC
Coaxial (Thicknet)	10Base-5	AUI (DB15-pin)
Fiber Optic (multimode)	10Base-FL, 100Base-FX, 1000Base-SX	ST, SC or MT-RJ

Network cards (also called network adapters) are relatively easy to install, as long as simple guidelines are followed. After installing the network interface card, you will have access to your LAN or to the Internet.

Tools/Preparation:

Ensure that a PC is available that can be opened and attached to the network after the NIC is installed. Before beginning this lab, read the *Cisco Networking Academy Program: First-Year Companion Guide*, Revised Printing, Chapters 1 and 2. Also review Semester 1 online Lesson 1.

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