THOMPSON RIVERS UNIVERSITY
COMPUTING 253

Workshop #2 –*"Look Inside the System"*

Marks: 5 marks   Due: Monday, January 24, 2005 (in lecture)

Introduction

The purpose of this workshop to introduce the key components of a small, personal computer system, otherwise known as a microcomputer (micro) or personal computer (PC). Yet, the terms "small" or "personal" are misleading terms, originating from the days when mainframes and minicomputers ruled processing world.

In the modern computing environment, PCs can be found sitting next to an end-user's desk, co-ordinating traffic over a network of hundreds of machines, or performing the processing tasks previously performed by the minis and mainframes of 20 years ago. The term "microcomputer" is now a description of the central *micro*-processor, not of the capabilities of the computer.

Yet even though these computers are much smaller than their large older cousins, they still contain all the components that make up any computer system. The power supply, memory, storage drives, input/output device connections, mainboard bus, and central processing unit are all somewhere within the system case…*but where?*

The "where" is the purpose of this workshop. This workshop covers the overview topics expressed in **Chapter 1**. Specifically,

1. "System case" and the externally accessible components and connections it offers
2. Internal configuration and positions of components
3. Mainboard organisation and the various devices attached to the mainboard

The next workshop continues examining the computer system, but in more detail. The next workshop also introduces the use of diagnostic software tools to help *exactly* identify components.

Reference

This workshop is based on topics presented in Chapter 1 of the textbook and the demonstration given by your instructor.

Concerns

Before handling the computer systems, take a moment to ensure that your cluster is clean and organised.   There should be no garbage or unneeded equipment or materials. When finished, *the cluster must be left in the **same condition** it was found*.

> **CAUTION**: These are electronic devices, meaning that they use **ELECTRICITY**.
> Ensure that the computer system is **off** whenever you are removing or inserting a component, and be very careful when working with the system when the case is open.

Procedure

After your team (of 2 or 3), is assigned a cluster, proceed through the following **Observation and Tasks** list.

Remember: your goal is <u>not</u> to only complete all tasks, but to understand what you have done—*so ask questions, and make notes*.

Documentation

Bound in a secure folder, and following a cover page describing the *course, workshop (title, #), date,* and *list of group members*, provide answers to the questions listed at the end of the workshop along with the properly labelled diagrams.

The three (3) diagrams prepared during the workshop <u>must be</u> prepared with a software tool (Visio. PowerPoint, CorelDraw, or Paint).

Note: In preparing your answers to the questions, type the original question before your answer.

You are encouraged to take personal notes for future reference. And if you have questions, ask!

Finishing

When finished, make sure that the expansion cards are still snug and the cables still connected in the computers, that the original hard drive and floppy drive are connected and working, all external cables are in place, and the computer boots problem-free to Windows, and connects to the Internet.
Make sure your cluster is as you found it.

Observations and Tasks

Part 1: Identifying the systems

1. The station (or cluster) consists of two computers: arbitrarily chosen as a server (black) and a workstation (white). These are connected together through a network switch, such that they can act as a complete and autonomous network.
    (specific network topics are discussed further in COMP263.)

2. On a sheet of paper, record:
    - the computer number on each case, for both server and workstation
    - the station number (you may have to ask your instructor)
    - a general description of visual/physical differences between the two

3. *Begin with the server computer for the following tasks;*
    these steps are then repeated for the workstation computer.

Part 2: Drawing a sketch of the externally accessible features

1. Do **Project 1-1** on **page 38**, for help see **page 5**, Figure 1-4.

2. Indicate which ports have physical connections present, and which do not (which ports have things *plugged in*?)

3. Next to the drawing, list the drives and buttons available on the front of the system case (a sketch for these is not required).

Part 3: Drawing a sketch of the general internal layout

1. On the rear of the computer, flip the "Power Switch" to off (O symbol).

2. Unplug all the cables, *but remember where each is plugged in*.
    Take the computer to the center work table area.

3. Looking at the computer from the rear, remove the "right" access panel.

    Ask your instructor for directions on removing the correct panel, as well as to which tools from the toolkit are required.
    If you any questions or concerns about the system, **ask! ask! ask!**

4. With the panel removed, draw a sketch of the internal layout of the case, with respect to drives, mainboard, CPU, power supply, and expansion cards (ignore cables)—*leave specific mainboard details for Part 4*.
    For help, see **page 8**, Figure 1-7.

Part 4: Drawing a diagram of the mainboard components

1. Do **Project 1-3** on **page 38**, use Figure 1-38 as an example.

2. In the mainboard diagram, make sure to include the following,
    - power connections (AT or ATX?)
    - CPU and CPU cooling fan (the CPU is below the fan!)
    - Primary memory (RAM); and type (SIMM, DIMM, or RIMM?)
    - Any Configuration jumper settings
    - "Chipset" (bus controller) chips
    - CMOS/RTC Battery
    - BIOS chip and CMOS chip
    - Floppy drive connector and IDE (CD-ROM, hard disk) cable connectors
    - CD-ROM audio cable (if present)
    - Front panel connectors (to connect switches and LEDs)
    - Expansion slots: ISA, PCI, AGP; which are occupied? with what?

Questions:

1. List five (5) differences between the server and workstation computers.

2. What is the difference between *firmware* and *software*?

3. List three (3) CPU manufacturers.

4. What do BIOS and CMOS stand for? What is the purpose of each?

5. What is the purpose of an expansion slot on the mainboard?
    Provide an example of an expansion card that is used in either (or both) of the computers.

6. Define memory: SIMM and DIMM. Which is used in your computers?

7. Type of ROM BIOS chips that can be upgraded without replacing the chips is called _____? How are they upgraded?

8. What is the purpose of the battery on the mainboard?

9. What is the measurement of frequency of a system bus and CPU? Which is faster, the system bus or the CPU?

10. Identify three (3) methods of storing mainboard configuration data.

11. *Gold* is used in many electronic components? Why? (give 3 reasons)

As with books, don't judge a computer by its cover—you don't know what's inside until you look!