ICS214 Computer Systems and Networking Laboratory

Practical Exercise 2: Internal components and interconnections

{Objective: Be conversant with the internal components of a computer system. Be able to understand and to write technical specifications of internal component for a microcomputer system. Acquire competency in the installation, connection and configuring the components into a functional computer system}

For this exercise, you are provided with a functional standalone microcomputer system. Your exercise is:

a) To dissemble the microcomputer system (disconnecting external components).
b) Dissemble the processing unit identifying the internal components and their specifications.
c) Re-assemble the processing unit.
d) Re-assemble the microcomputer system.
e) Report on functions, specifications and architecture of various components found within your computer system.

Task 1

1.1. Identify and disconnect the external peripherals from the processing unit. Open the casing.
1.2. Inside the casing, identify the power supply, motherboard, back plane (if any), hard disk, CD-ROM and floppy drive.
1.3. Write a brief explanation of the function of the motherboard.
1.4. Identify the leads and connectors from the power supply stating what components they are meant for?

Task 2

2.1. In computer architecture we identified four main components of a computer system, namely, CPU, memory, I/O module and the interconnection bus. Describe their physical realization within your microcomputer system.
2.2. In the context of motherboard design, explain the concept of "onboard" components.
2.3. Identify all the following components and disconnect them from the motherboard. **To avoid damage, exercise extreme care as you disconnect the components**.
    2.3.1. CPU; note down specifications.
    2.3.2. Memory; note down specifications.
    2.3.3. IDE/ATA hard disk connectors
    2.3.4. Floppy disk connectors
    2.3.5. Expansion cards, eg. Network card, sound cards, video controllers

2.4. Identify all the following components that may be on the motherboard; draw a sketch diagram of the motherboard layout indicating the locations of the components; explain the functions of the components.

2.4.1. Power supply connectors
2.4.2. Cache memory or cache memory slot(s)
2.4.3. System BIOS
2.4.4. Video controller
2.4.5. CPU socket(s)
2.4.6. Memory slot(s)
2.4.7. PCI slot(s)
2.4.8. ISA slot(s)
2.4.9. AGP slot
2.4.10. "chipset" ICs

2.5 Explain the PC concept of "the chipset"; in that regard, name the chipset that has been used in your system; outline the (external) architecture of chipset.

2.6 Explain the maximum memory capacity you would be able to install on your system if you had a large number of *only*

a) 32 Mbytes DIMM modules
b) 128 Mbytes DIMM modules

Task 3

3.1. Re-assemble all components back onto the motherboard. **To avoid damage, exercise extreme care as you reconnect the components.**

Task 4

4.1. Re-assemble all components into a functional computer system.
4.2. Ensure that the system is able to successfully start Windows 95.

Task 5

5.1. Research and write a brief report on the major differences between the following Intel processors: Pentium III, Pentium IV, Duo Core, Xeon quad core