

covered in the next chapter.



Figure 4 .11: Memory-HDD

Features of Secondary Memory:

- These are magnetic and optical memories
- It is known as backup memory.
- It is non-volatile memory.
- Data is permanently stored even if power is switched off.
- It is used for storage of data in a computer.
- Computer may run without secondary memory.
- Slower than primary memories.

2.2.2 Upgrading Memory

Upgrading memory, in other words, increasing the amount of RAM in a computer, is one of the most common tasks an IT person has to perform.

Basic Inquiries Before Upgrade. Before you start memory upgrading you should ask the following questions. The answers should govern your decision to upgrade.

- i) How much additional memory can the system board accommodate?
- ii) What kind of memory does the system board require? What form does the present memory take?

- iii) How much memory does the computer have now? Does it need to be replaced?
- iv) How much more memory is required? How much memory would be cost effective. If a computer is only lightly loaded, there is no point in increasing its memory too much.

Answers to the Basic Inquiries. Question i and ii can be dealt with manual of the system board. While for the later 2 questions (i.e. iii and iv) we need to identify the current status of the computer being used. Here we consider both Windows and Linux operating system to get this information.

In Windows 8 and 10. In window 8 and 10, use the following 2 steps to find out the RAM status on your computer:

1. Open Task Manager by right-clicking the taskbar, and then clicking Start Task Manager.
2. Click the Performance tab. The bottom two graphs display how much memory is being used in megabytes (MB). The percentage of memory being used is listed at the bottom of the Task Manager window. It is shown in Figure 4 .12.

In Linux. In Debian Linux family like Ubuntu 14.04 LTS, you need to invoke the utility called “System Monitor.” It show the performance of your computer in terms of its processor, memory and network traffic. The middle panel shows your RAM performance. Figure 4 .13 will appear for this purpose.

Time to Upgrade. Once you have answers to these questions you can start to add extra memory in your computer. For this purpose, we maintain the following 8 steps:

Step 1: Open the case.

Open the case (you may need a screwdriver for this step).

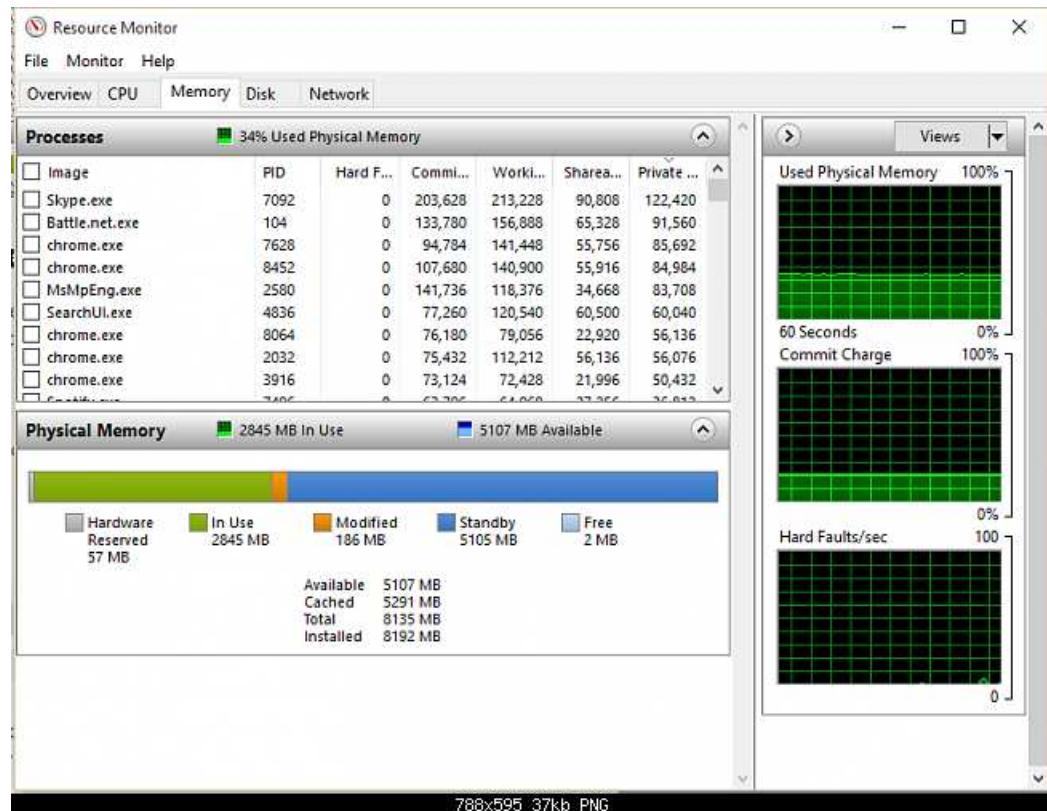


Figure 4 .12: Windows Resource Monitor: Shows RAM performance



Figure 4 .13: Ubuntu System Monitor: Shows RAM performance

Step 2: Check how many sockets you have for RAM.

Your motherboard has a limit to the number of RAM sticks you can install. Some motherboards support only two, while others support four, six, or even more.

Most motherboards have a limit to the amount of memory that they support, regardless of the number of slots. Consult motherboard manual for further details.

Notes

Step 3: Locate your RAM sockets.

Most motherboards have 2 or 4 RAM slots. RAM sockets are typically located near the CPU, though their location may vary depending on the manufacturer or model. Refer to your motherboards layout diagram in your documentation if you are having difficulty locating the sockets.



Figure 4 .14: Step 3 of RAM installing: Locate RAM Sockets

Step 4: Remove old RAM (if upgrading).

If you are replacing old RAM, remove it by releasing the clamps on each side of the socket. The RAM will be released from the socket, and you will be able to lift it straight out of the motherboard with little to no effort.

Step 5: Unpack the New RAM.

Carefully remove the Ram from the shielded packaging. Grip it from the sides to avoid touching the contacts on the bottom or the circuitry on the board.

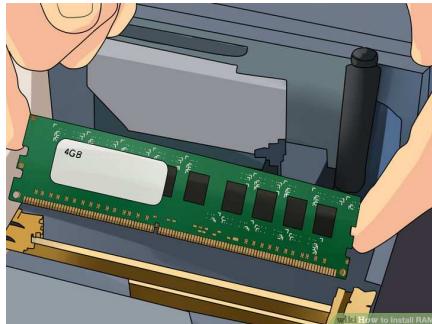


Figure 4 .15: Step 4 of RAM installing: Remove Old One (if upgrading)

Step 6: Insert the RAM into the RAM slot.

Line up the notch in the stick of RAM to the break in the slot. Set the stick into the slot and then apply equal pressure onto the stick until the clamps on the side click and lock the RAM in. You may have to apply a fair amount of pressure, but never force it in.

Make sure matching pairs are inserted into their matching sockets. Most are labeled on the board or by color, though you may need to refer to your motherboard layout diagram. Make sure that they are facing the same way.



Step 7: Close up the computer and Restart.

Now close the case and restart the computer.

Step 8: Check the New RAM on Your System.

After the computer is rebooted, right-click on the "My Computer" icon and select Properties from the pop-up menu to verify that the computer recognizes the RAM you've just installed.

For Linux users run Details under Settings Option. It shows the total *memory* installed in your computer. You should see a similar figure as shown in Figure 4 .17.

2.3 Exercise

2.3.1 Multiple Choice Question

1. Which type of memory needs to be refreshed and rewritten continuously?
 - a) SRAM