

Section 05.1 - Operating System

Layer 4: Operating System

Syllabus Content Section 05: System Software

S05.1.1 Explain why a computer system requires an Operating System (OS)

Operating System: Software that allows you to interact with the hardware
Operating system can interact with hardware

Management Tasks: Things that help in the organisation of your files and the communication between hardware

Utility Tasks: Things that make sure your hardware has no errors / not broken and is secure.

S05.1.2 Explain the key management tasks carried out by the Operating System

- Including memory management, file management, security management, hardware management (input/output/peripherals), process management

Memory Management

1. Single Contiguous

- Only one thing can be in RAM at any time
- If there is not enough space in RAM then it cannot run

2. Fixed Partitions

- Your OS splits up your RAM into different parts. These parts are called partitions
- The size of each partition is fixed. If you need a bigger partition then you have to turn off your computer and reset the partition size in your OS

3. Dynamic Partitions

- The partitions can change size. They are dynamic.

File Management

The files on your computer are stored in your hard drive.

You can name your file, move your file, delete your file, copy your file but though all of it you don't know exactly WHERE it is on your hard drive.

The OS handles where files are actually stored on your hard drive

Security Management

Security management checks to see if you have anti-virus

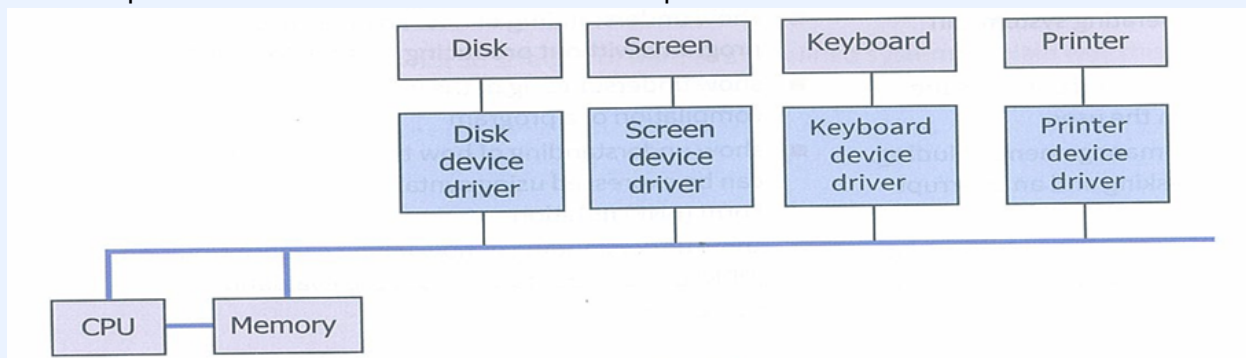
And more often, security management means user access control and user rights.

- User Access Control (UAC):
What users can access your computer / files.
Usually just a login + password
- User Rights
Even if a person has UAC, they also have different User Rights.
UAC says if a person can ACCESS your computer / files.
User rights says what that person can DO with your computer / files

Hardware management (input/output/peripherals)

A driver is a piece of software that communicates with hardware.

So each piece of hardware comes with a small piece of software, called a driver.



Process Management

Every process is in one of 5 states:

1. New
Process wants to start
2. Ready
Process is loaded into memory and ready to start
3. Running
Process is currently being executed

4. Waiting

Process is waiting for something

5. Terminated

Process is finished

S05.1.3 Show understanding of the need for typical utility software provided with an Operating System

- Including disk formatter, virus checker, defragmentation software, disk contents analysis/disk repair software, file compression, back-up software
-

Utility tasks are things that make sure your hardware has no errors / not broken and is secure.

| Disk formatter

Deletes everything from your hard drive

| Virus checker

Checks your computer for viruses and other malware.

| Defragment

A defragmenter just puts your files near each other so the hard drive head does not have to travel far and your platter doesn't have to spin as much.

Makes it faster to access your files

| Disk content analysis / disk repair software

This is where every track sector of your disk is checked to make sure it can read, write and store data correctly.

To make sure that all parts of our hard drive are working correctly.

| File compression

Just taking a large file and reducing the size.(.zip file)

Either lossy or lossless

| Backup software

This next part covers data backup but also some other things that deal with data security.

S05.1.4 Show understanding of program libraries ▾

Including:

- software under development is often constructed using existing code from program libraries
 - the benefits to the developer of software constructed using library files, including Dynamic Link Library (DLL) files
-

A program library is just code written by the people who made your OS.

So when you are making your own program and you want to have a save feature, or print, or new..... Instead of making your own, you can use the one that the OS developer has already made.

- Benifit:
 1. Saves your time, you don't have to make anything new
 2. Saves money, because you are not wasting your time
 3. Guaranteed to work, because they (the OS people) made it
 4. Familiar layout to the users
- Drawback:
 1. Not customized to your needs
 2. If the library file gets corrupted then you have big problems

| Static Linked Library (LIB)

1. Write your code
2. Make a link to the Print feature from the program library
Now, when you run the the code and it gets to the Print feature, it does not LINK to the print feature, it COPIES it into your final .exe code
You are still using a program library because you did not have to write the Print feature, but now your final code is bigger because it COPIED the Print feature into your code.

| Dynamic Linked Library (DLL)

1. Write your code
2. Make a link to the Print feature from the program library
Now, when you run the the code and it gets to the Print feature, it LINKS to the

print feature, no coping needed.
This means your file size is smaller