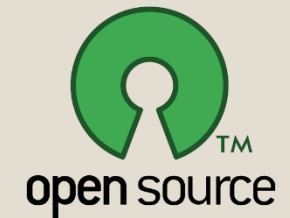
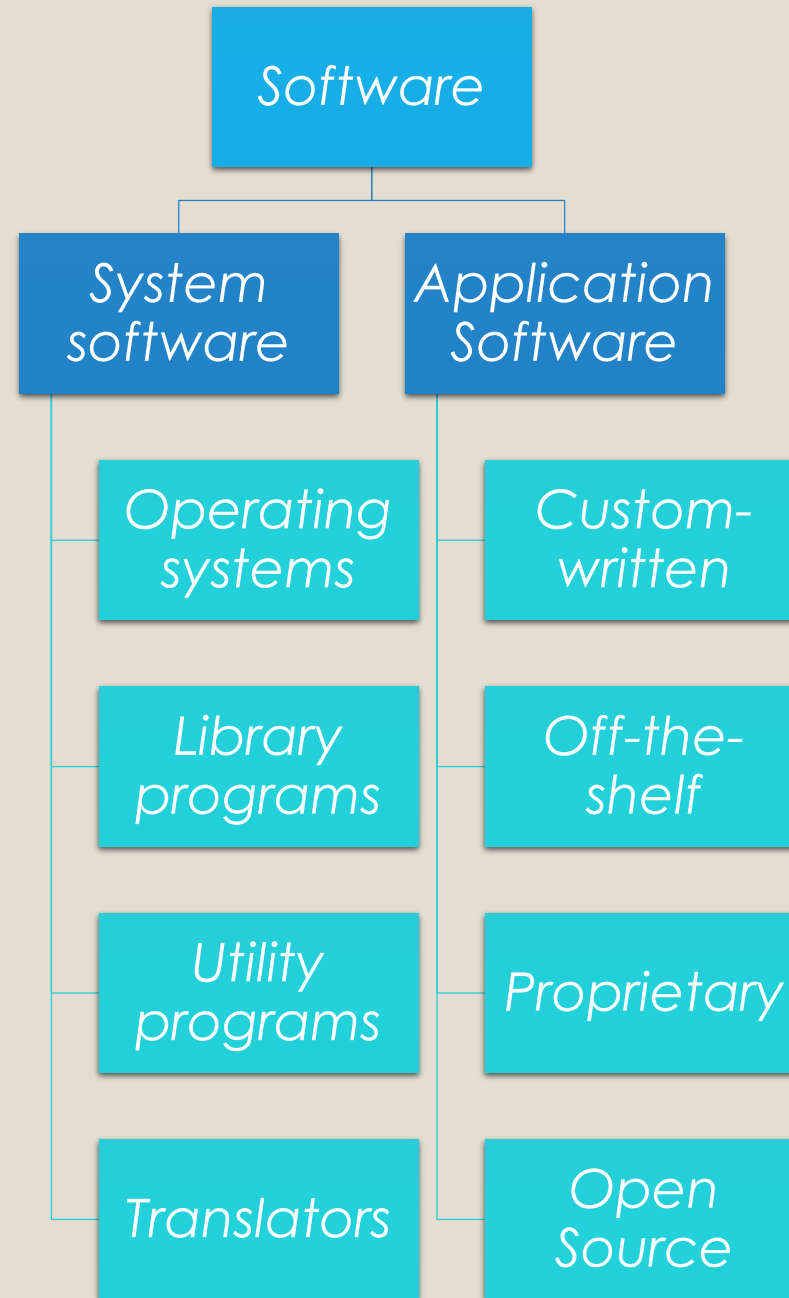


Software

Software:

Is a collection of instructions that form applications that run on a computer system - they are virtual/not physical - and enable the user to interact with the system, its hardware, or perform tasks.



Systems software

System software = The software needed to **run the computer's hardware and application programs**. This includes the operating system, utility programs, libraries and programming language.

1. The operating system

The OS is collection of programs that lie between applications software and the computer hardware, and has many different functions, including:

- **Resource management** – Managing the computer's hardware (CPU, memory, storage disk drives, keyboard, monitor, printer and other peripherals)
- **Provision of a user interface** (e.g. Windows) to enable users to perform tasks such as running application software, changing settings on the computer, downloading and installing new software, etc.



Operating System

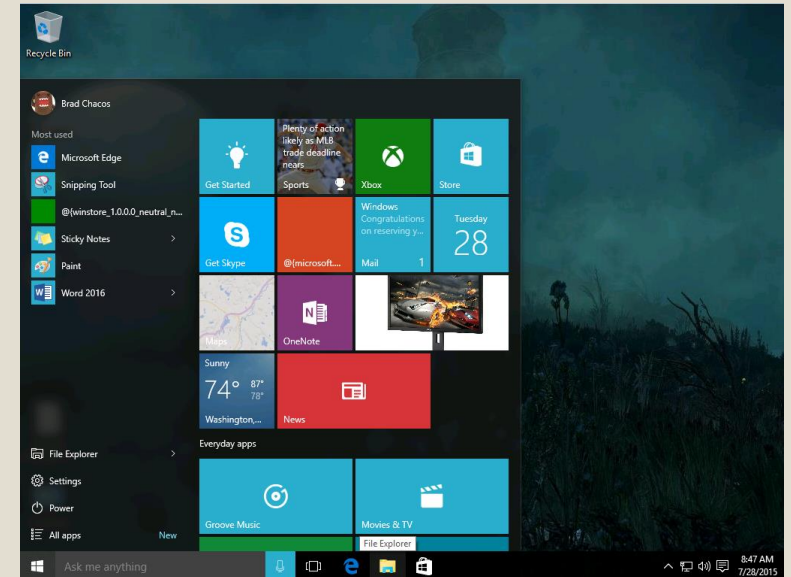
An operating system is the core software (collections of applications) that allows a computer to **run as a useful device**; it manages the hardware, the user interface and all other software running on the computer making it a practical machine (bridge between user and hardware).

The operating system has four main parts: (no matter the type, they all share these 4 main components):

- * The **KERNEL**
- * The **DEVICE DRIVERS**
- * The **USER INTERFACE**
- The **SYSTEM UTILITIES**

An operating system is low-level software that supports a computer's basic functions, such as scheduling tasks and controlling peripherals.

It provides a user interface and a platform for other software to run on.



2. Utility Programs

Utility software is system software designed to help analyse, configure, optimize or **maintain** a computer system. They provide extra functionality to ease the **management** of a computer system and can be brought as stand-alone programs.

Its primary focus is to manage the function of the computer system's infrastructure rather than the tasks to benefit the user.

Examples:

Crystal disk information (Providing information and health/SMART status of HDDs), Backup software, File restoration software, Compressing/decompressing software, software to encrypt data before transmission, Task Manager (Provides information on running programs and the use of the computer's resources), anti-virus software, auto-updaters, firewall software, file management and transfer programs, disk defragmentation software, system clean-up software.....



Security utilities:

Anti-Virus & Anti-spyware software & Firewall

***Anti-virus (Virus-Checker) software** prevents malicious computer programs that were coded to cause damage or inconvenience to the user. It checks the hard drive and depending on the level of protection offered, your emails and downloads, identifies, prevents and removes these viruses. Some protect other applications from unauthorised modification.



Spyware protection prevents programs that secretly record what the user is doing on the computer (like a key logger) from being installed.



Firewall software prevents unauthorized access to a computer or network from the internet (filtering can also prevent inbound or outbound signals from certain networks).



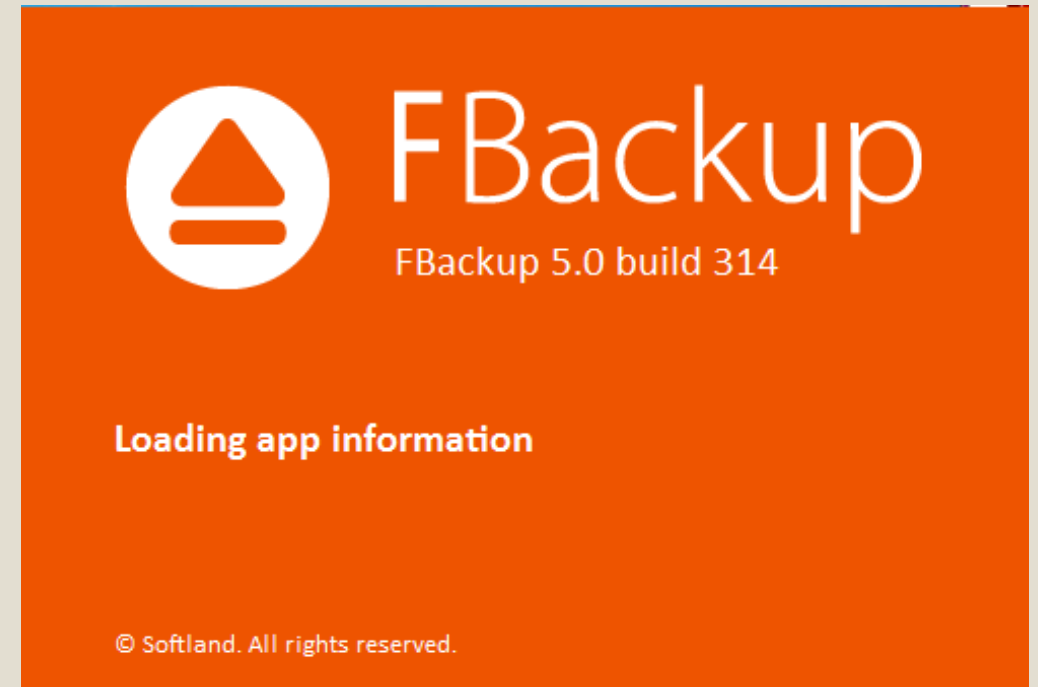
***Backup and recovery** programs make copies of files and data that can later be restored if it is lost by a vulnerability or failure.

*Automatic backup

Several free automatic backup utilities are available for personal and commercial use.

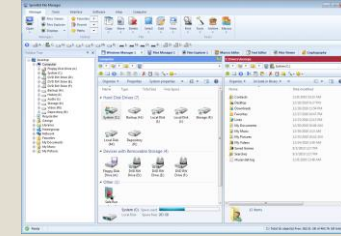
The automatic backup utility allows the user to :

- Specify the location to store the backup
- The Sources of data to be backed up
- How the backup is carried out – zipping copies of files or making a mirror of a drive that does not zip files
- The frequency at which the backup occurs (you can schedule to run it automatically or manually)



Disk organisation utilities – File management, transfer and compression & Formatters & Defragmenter

Formatting programs can delete all data on a storage device and format it for use in the correct way so that the OS can communicate with it.



***Disk defragmentation programs** can rearrange the files on a magnetic hard disk so that files that have been split up and stored all over the hard disk are recombined in a single series of sequential blocks.

Common files are grouped together in a logical consecutive order so that they are faster to access.

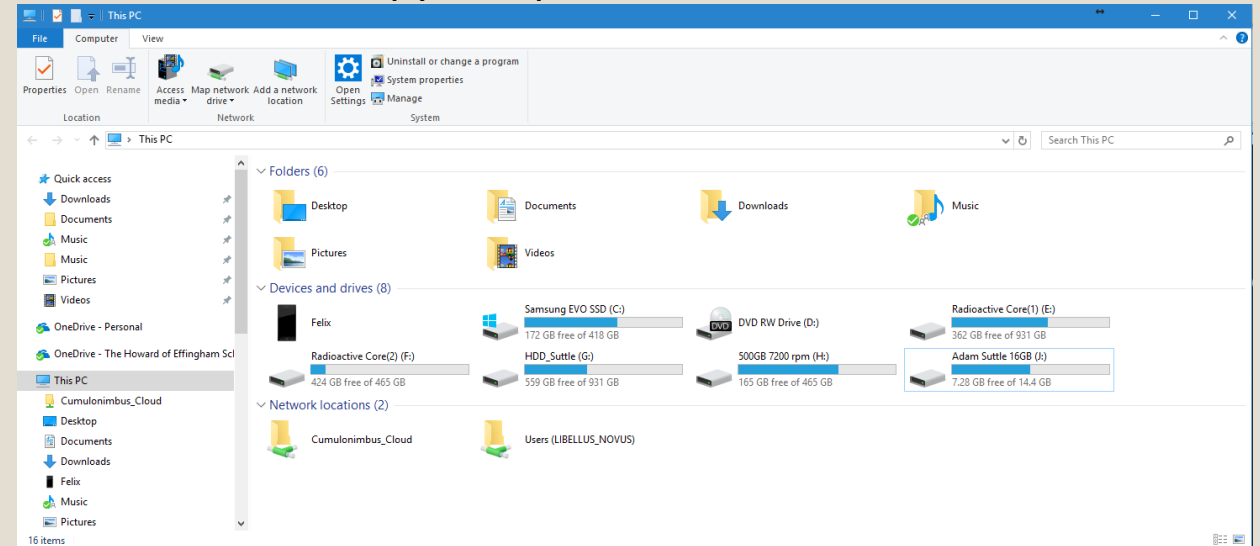
How does fragmentation occur?

When large files are saved they may not fit on the hard disk in consecutive memory locations so they must be split up and stored all across the hard disk. Fragmented files increase access speeds as the OS has to locate the files before running them.

Reorganizing files consecutively means that fetching instructions and data from secondary storage can take place at a faster rate. It also means that free memory locations for future data are sequential so the programs do not require fragmenting.



File management and transfer programs are utilities that allow the user to copy/cut/paste, create, delete and move files and folders to organise data on secondary storage.



Compression software

Several utilities are supplied as part of the operating system. These included file managers to copy, move and delete files and create, move and delete folders.

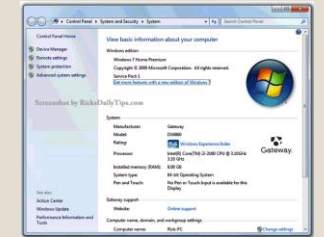
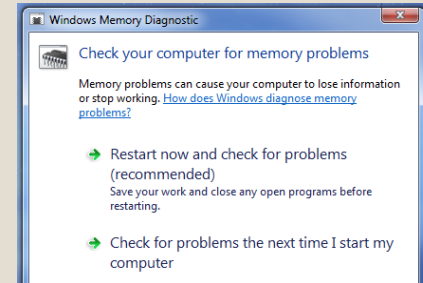
Other utilities such as WinZip for compressing and sharing files have to be purchased from independent suppliers.

Zipped or compressed files can be transmitted more quickly over the internet. Sometimes there is a limit on the file size of transmission – email attachment limits. Even if they are able to receive a transmitted file it can take several minutes to download larger unzipped files when the broadband connection is slow.

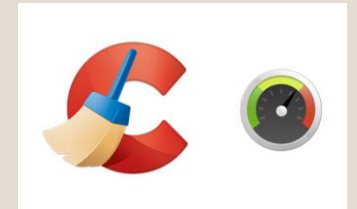


System maintenance utilities – System information and diagnosis, System clean-up, Auto-updaters

System information and diagnosis provide information on how each of the hardware components are being used and their performance.



System clean-up tools search for and delete files that are no longer required (temporary files, files created when software was installed).



***Automatic updaters** search for recent updates on the internet of currently installed programs and the operating system, download new versions and install them without requiring the user to manually search for new versions of software.

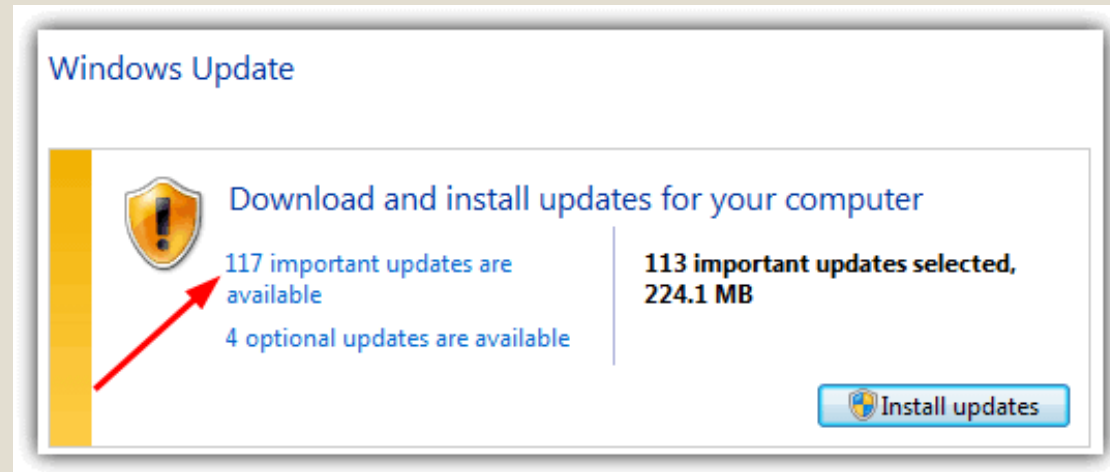


Automatic update utilities

An automatic update utility will make sure that all software installed on the computer is up-to-date. The utility software checks the internet regularly for newer versions of currently installed software. It downloads and installs these automatically.

Firewalls & anti-virus software must be regularly updated as new viruses and threats are constantly being devised and discovered.

Application software should also be regularly updated as there will be bug fixes and improvements that become available to people with a licence to the package.



Applications software

- **General -purpose software:** Programs that can be used to perform a wide variety of real-world tasks that the user wants. It is not limited to one particular function.

Examples include –Word processors, Adobe Photoshop, Spreadsheet package, presentation software and a graphics package can be used to produce advertisements or animations.

- **Special-purpose software:** Performs a single specific task or set of tasks. Limited functionality for the every day user's needs.

Examples include: payroll and account packages, hotel booking systems, fingerprint scanning systems, browser software....



All types of application software can be classed as *off-the-shelf* or *custom-written (Bespoke)*



Off the shelf

Advantages

Less expensive as the cost of development of each piece of software is spread over a wide community of buyers.

Ready to be installed immediately

Well documented, well-tested and few errors. Large amounts of money has been invested into its development.

Easier to share files produced by the software as there is a higher chance of other people are using the same compatible software.

User does not have to submit any design requirements/specifications

Easier to get support and fixes due to wide community of users

Disadvantages

May contain a lot of unwanted features, and some desirable but non-essential features may be missing

Compromises: May not have specific functionality required for commercial purpose

The user has little power over the future functionality of the software functions since the developer owns the rights to future alterations.

Off the shelf software: *describes programs that have been designed, coded and ready to use, so available to the general public to buy.*

Bespoke

Bespoke (Custom written) software is specially designed and coded for an organisation by a team of programmers. It accommodates for particular preferences and expectations. (e.g. Custom coded till software, banking service, hotel visitor booking software)

Advantages	Disadvantages
Features are customised to the users requirements and other features can be added as needs arise. (no compromises).	More costly and requires expertise to analyse and document requirements .
Specially designed software may offer a competitive advantage over off the shelf software available to the public.	May take a longer time to develop.
No licencing software cost with custom written software as the buyer can decided to replicate it.	May contain errors which do not surface immediately.

Open Source Vs Closed Source

Open source software is software that is distributed with the source code and can be modified for enhancement by anyone. It is governed by the Open Source initiative that says:

- Software is licenced for use but there is no licence fee. Anyone can use it.
- Open source software must be distributed with the source code so that anyone can modify it.
- Developers can sell the software that they have created.
- Any new software created by open source software must also be “open”. It must be distributed or sold in the form that other people can read and also edit the source code.

NOTE: This is different to **Freeware**. Freeware is software that is free to use but the user cannot view or modify the source code and so can't edit the functionality. Freeware has restricted use.

Closed source software is also called proprietary software. It is owned by the organisation that developed it and buyers cannot edit the source code. It is sold in the form that requires a licence to use it and the use is restricted.

- There will be restrictions on how the software is used, the licence may specify only one concurrent user, or it may permit up to 50 users on one site (site licence).
- The company or person who wrote the software will hold the copyright. The users will not have access to the source code and will not be allowed to modify the package and sell it to other people. This would infringe the copyright (Copyright, Designs and Patent act).

Advantages to open source:

- 1) The user can edit the source code and so modify the software to perform a suited function (it is flexible)
- 2) As the source code is accessible and there is a wide community of users; bugs and issues can get solved quicker.
- 3) Open source software is generally free to use and no licenses are required.

Disadvantages:

- 1) There tend to be less fixes for bugs as open source users rely on a community of users rather than a support service.
- 2) Because there is no need to provide a piece of software that will generate money, the software tends to be more focused around in-line developers than needs of public users.
- 3) They can be less user friendly as there is not as much time spent into developing the user interface.

Advantages of Proprietary software:

- 1) Users can take advantage of the customer support service provided in the cost to help them with bugs, issues, instructions on its use.
- 2) Proprietary software tends to be more used and so users will find the files made on the software is generally compatible with other computer systems.
- 3) This software has gone under extensive development and lots of money is invested into the user interface and so they tend to be easy to use and there are less bugs/errors in code.

Disadvantages:

- 1) There are usually licensing costs to the software and the initial price can be very high.
- 2) As there is not a wide community of users who can view the source code, users rely on the developer identifying and then fixing bugs and issues with the software. Fixes can usually take a long time to release.
- 3) The complicated coding means that it is difficult to adapt to changes and users can't access the source code so won't be able to modify the software to meet their needs (make compromises).