Utility Software - Reading

Utility software helps users to **configure**, **analyse** and **maintain** a computer. This software normally consists of small tools which are thought of as part of the operating system as they normally come bundled with it. Their purpose is of a technical nature which is how they differ from **application software**.

Antivirus, **disk cleaners** and **clipboard managers** are all examples of utility software. Some others are described in detail below.

Backup software

Backup software will back up files on a disk at regular set intervals. This can be backups to other hard disks, tape, or increasingly servers on the Internet (advertised as "cloud" backup services). Backup software also needs to be able to restore the information. When everything on a hard disk is backed up this is known as a **full backup**. This takes a long time, so it is possible to back up just the data which has changed since the previous backup. This is known as an **incremental backup**.

Encryption software

Encryption tools are used for **encrypting** and **decrypting** information. For instance, there are now facilities to encrypt entire hard disks and removable media so that if the computer is lost or stolen the information cannot be read. These require a **password** or **PIN** to be entered before information can be accessed. The use of encryption software is especially important if there is personal data as the **Data Protection Act** requires that the data is kept safe.

It is also possible to encrypt **email** before it is sent. **Public key cryptography** is a common way to do this. A **public key**, which is known to everyone, is used to encrypt the data. This can only be decrypted with a **private key** known only to the user you send the email to.

Compression tools

Compression tools take files and convert them to compressed files which have a smaller file size. This is used to **compress** entire disks to create more storage space or to compress individual files (such as zip compression) to send them via email. There are many ways this is carried out. **Run-length encoding** looks at how many repeats of data there are and stores the string and how many times it needs to be repeated. **Huffman coding** looks at the number of times letters or strings occur and gives shorter codes to the more frequently occurring ones. Compression tools need to use a **lossless compression** as they are compressing files such as spreadsheets and executables. When **uncompressed** these files need to be exactly the same as when they were compressed.

Disk defragmenters

A hard disk saves files as **fragments** on the **platter**. Each fragment may need to be saved in different locations on the disk if there are already files on the disk. This means that the drive head may need to move many times when seeking fragments. This will slow down the time to read a file. **Defragmentation software** will move files so that all their fragments are next to each other on the disk. This will reduce the time needed to read files. **Solid State Disks** (**SSDs**) do not need **defragmentation**. Although data may be in different locations there are no drive heads so data can be accessed just as quickly. Defragmenting an SSD can reduce its lifespan.