A Glossary of Computer Terminology

**Arduino**

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs (light on a sensor, a finger on a button, or a Twitter message) and turn it into an output (activating a motor, turning on an LED, publishing something online). You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.

**Anti-virus**

Software that detects and prevents known computer viruses from attacking your device. An anti-virus program is built-in to Windows and is called ‘Windows Defender’. Alternatively, you can buy a commercial program such as Norton or McAfee or download a free alternative such as Avira, Avast, AVG, Malwarebytes. etc.

**Application** (sometimes shortened to ‘app’)

Computer software, also known as a ‘program’ or ‘app’ that performs a task or set of tasks, such as word processing or drawing. Applications, apps or programs can be thought of as electronic ‘tools’ for doing electronic jobs. For example, if you want to write a book, you will need a ‘word-processing’ program – a program that allows your computer to be used like a typewriter (and filing system).

**Bandwidth**

The capacity of a networked connection. Bandwidth determines how much data can be sent along the networked wires. Bandwidth is particularly important for an Internet connection, since greater bandwidth also means faster downloads. Think of bandwidth as being similar to measuring the capacity of a pipe to deliver water to a tap. A ‘fat’ pipe can carry more water to a tap than a ‘thin’ pipe. Similarly, a high-bandwidth connection can deliver more information at a faster rate to a computer. Bandwidth is measured in Megabits per second (Mbps). A slow connection might be around 2 or 3 Mbps whilst a fast connection will be more like 50 or 70 Mbps. Domestic broadband connections vary in speed depending upon a number of factors such as, in some circumstances, your geographical location (in relation to the telephone exchange) as well as what type of connection you have and what package you’ve signed up for with your ISP.

## **Bash**

## A UNIX shell used for entering command-line executions. Included with most Linux distributions and macOS. Includes SSH capability.

**Batch Job**

A batch job is a computer program or set of programs processed in batch mode. This means that a sequence of commands to be executed by the operating system is listed in a file (often called a batch file, command file, job script, or shell script) and submitted for execution as a single unit.

**Binary code**

The most basic language a computer understands, it is composed of a series of 0s and 1s. The computer interprets the code to form numbers, letters, punctuation marks, symbols, pictures, videos, sounds and computer programs themselves!

**Bits, Bytes, Kilobytes (Kb), Megabytes (Mb), Gigabytes (Gb) and Terabytes (Tb)**

All of these terms refer to the size of a file or the capacity of a storage device.

A bit is the ‘atom’ of computer information and is the smallest single piece of information, either the number 0 or 1. In short they are called binary digits, or bits for short.

A byte is a collection of 8 bits.

A Kilobyte is 1024 Bytes.

A Megabyte is 1024 Kilobytes.

A Gigabyte is 1024 Megabytes.

A Terabyte is 1024 Gigabytes.

Why 1024? It seems like a random number! But there is logic behind this. Computers work on the binary system – I.E. they count in ‘base 2’ unlike humans, who count in ‘base 10’. 1024 is 2 raised to the power 10 – I.E 2X2X2X2X2X2X2X2X2X2 = 1024!

When we see ‘10’ we humans know it means ‘Ten’! the ‘1’ represents one bundle of ten and the ‘0’ means ‘none left over – no ‘units’.

But in binary notation, ‘10’ means one bundle of 2 and no units – or ‘two’ as we humans think of it.

**Boot**

To start up a computer. Cold boot means restarting computer after the power is turned off. Warm boot means restarting computer without turning off the power.

**Breadboard**

A breadboard is a solderless device for temporary prototype with electronics and test circuit designs. Most electronic components in electronic circuits can be interconnected by inserting their leads or terminals into the holes and then making connections through wires where appropriate. The breadboard has strips of metal underneath the board and connect the holes on the top of the board.

**Broadband**

Broadband is a generic term for the internet connection which allows you to access the internet. To get home broadband, you will need to set up a contract with a broadband provider (such as BT, TalkTalk or Virgin to name just a few) who will charge you for the equipment needed to connect your smartphone, tablet or computer to the internet.

**Browser**

A software program used to navigate the World Wide Web. Google Chrome, Mozilla Firefox, and Microsoft Edge are today's most popular browsers for accessing the World Wide Web.

**Bug**

A malfunction due to an error in the program or a defect in the equipment.

**Byte**

See ‘Bits’

**Cache**

A small data-memory storage area that a computer can use to instantly re-access data instead of re-reading the data from the original source, such as a hard drive or website. Browsers use a cache to store web pages so that the user may view them again without reconnecting to the Web.

**Chip**

A tiny wafer of silicon containing miniature electric circuits that can store millions of bits of information.

**CLI**

Command-Line Interface. This is a text-based interface that is used to operate software and operating systems while allowing the user to respond to visual prompts by typing single commands into the interface and receiving a reply in the same way. When you see “hackers” in TV shows and movies, they are usually typing in the CLI.

**Cloud storage**

This allows you to save photos, videos and files to a storage area on the internet, rather than taking up space on your device. Examples of cloud storage include Google Photos, Google Drive and Dropbox.

**Cookie**

A text file sent by a Web server that is stored on the hard drive of a computer and relays back to the Web server information about the user, his or her computer, and/or his or her computer activities and preferences. Cookies are a normal part of using the Internet and, generally, are not a cause for concern!

**CPU**

Central Processing Unit. The brain of the computer. Also called the ‘processor’. For more information, see the CCLA hardware resource.

**Crash**

A hardware or software problem that causes information to be lost or the computer to malfunction. All computers crash occasionally but it is rare for a crash to cause serious problems.

**Cyberspace**

Slang for internet i.e. An international conglomeration of interconnected computer networks. Begun in the late 1960s, it was developed in the 1970s to allow government and university researchers to share information. The Internet is not controlled by any single group or organization. Its original focus was research and communications, but it continues to expand, offering a wide array of resources for business and home users.

**Database**

A collection of similar information stored in a file, such as a database of addresses.

**Debug**

Slang. To find and correct equipment defects or program malfunctions.

**Default**

The pre-defined configuration of a system or application. In most programs, the defaults can be changed to reflect personal preferences. Essentially, default means how a program will work unless the user changes the settings.

**Desktop**

The first screen displayed on a computer once it has started up. It is where you begin and end your computing session

**Directory** (also referred to as a ‘folder’)

A repository where all files are kept on a computer.

**Disk**

(also referred to as a hard disk or hard drive) A hard disc stores vast amounts of data. It is usually inside the computer but can be a separate peripheral on the outside. Hard disks are made up of several rigid coated metal discs. Hard disks in modern laptops vary in size from 80 Gigabytes (Gb) and upwards.

A new type of storage device, known as an SSD – Solid State Drive – is gradually replacing hard disks in computers. An SSD is better than a traditional hard drive because it has no moving parts and so is likely to be more durable. It’s also faster than a standard hard disk.

‘Floppy discs’, popular to store information until a few years ago, are no longer used.

Flash Drives, more commonly known as ‘memory sticks’ are really portable SSDs.

**Domain**

Domains can be thought of as ‘electronic places’. For example the BBC has a domain – it is called ‘bbc.co.uk’

**Download**

When you copy information that is located on another computer to your own computer, you are ‘downloading’ it.

**DTN**

Delay-Tolerant Network. This is a network designed to operate effectively over extreme distances such as those encountered in space communications or on an interplanetary scale.

**Encryption**

The process of transmitting scrambled data so that only authorized recipients can unscramble it. For instance, encryption is used to scramble credit card information when purchases are made over the Internet.

**Ethernet**

A type of network, using wires.

**File**

A set of data or information that is stored in the computer.

**Firewall**

A set of security programs that protect a computer from outside interference or access via the Internet.

**Folder**

An electronic ‘container’ for storing electronic files and other folders. In some operating systems, it is called a directory.

**Freeware**

Software programs created by people who are willing to give it away for the satisfaction of sharing or knowing they helped to simplify other people's lives. It may be free-standing software, or it may add functionality to existing software.

**Gigabyte**

See ‘Bits’

**GPU**

Graphics Processing Unit. This is a chip or electronic circuit capable of rendering graphics for display on an electronic device.

**GUI**

Graphical User Interface. A system that simplifies selecting computer commands by enabling the user to point to symbols or illustrations (called icons) on the computer screen with a mouse. Windows is the best known GUI.

**Hardware**

The physical and mechanical components of a computer system, such as the electronic circuitry, chips, monitor, disks, disk drives, keyboard, router and printer.

**HPC**

High-Performance Computing/Cluster. Most generally refers to the practice of using computing power in a way that delivers much higher performance than one could get out of a typical desktop computer or workstation in order to solve large problems in science, engineering, or business.

**HTML**

Hypertext Markup Language. HTML is the computer coding that is used to create websites.

**HTTP**

Hypertext Transfer Protocol. The set of rules – also known as protocols - that allow the World Wide Web to operate as it does. Many website addresses begin with ‘http’. For example, the address of the BBC website is generally thought to be ‘www.bbc.co.uk’. However part of the address is hidden – the ‘http’ bit! The full address of the BBC website is http://www.bbc.co.uk. The web browser assumes the http part so that you don’t have to type it in. Websites that don’t begin with http begin instead with https – see below.

**HTTPS**

HTTPS is short for ‘Hypertext Transfer Protocol Secure’. These websites are ‘secure’. This means that any information you type in or information that the site sends to your computer is ‘encrypted’ (scrambled) so that it can’t be read or intercepted by a third party.

Banking, shopping and email sites are generally encrypted. You should definitely NOT type any sensitive information (such as credit card details) into a webpage unless it’s secure. There is normally a padlock symbol on the left of the address bar on secure websites.

**Hyperlink** (or ‘link’ for short)

A piece of text or an image that is connected by hypertext coding to a different location. By selecting the text or image with a mouse, the computer jumps to (or displays) the linked information.

**Hypertext**

Virtually all web pages include hypertext (text with special properties) that links the user to other pages at that site, or to other sites on the World Wide Web.

## **Hypervisor**

## Also known as a *virtual machine monitor*, a hypervisor is software/hardware that creates, runs, and manages virtual machines.

**Icons**

Symbols or illustrations appearing on the computer screen that indicate program files or other computer functions. To initiate them, they usually have to be double clicked.

**Input**

Data that goes into a computer device or computer program.

**Input device**

A device, such as a keyboard, stylus, mouse, trackpad, or microphone, that allows input of information (letters, numbers, sound, and video) to a computer.

**IP** (Internet Protocol) **address**

An Internet Protocol address is a unique set of numbers used to locate another computer on a network. This makes it possible to deliver the correct information to a particular computer. The IP address of a computer plays a similar role to the address of a house or business – it ensures the right information is delivered to the right person. Here’s an example of an IP address: 87.81.166.88. This address uniquely identifies my computer on the Internet.

**ISP** (Internet Service Provider)

The company that provides you with a connection to the Internet either via your telephone line (broadband), a fibre optic cable (fibre broadband) or via a cable service (Sky or Virgin Media)

**Kilobyte**

See ‘Bits’

**LDAP**

Limited Lightweight Directory Access Protocol. This is an open and cross platform protocol used for directory services authentication. LDAP provides the communication language that applications use to communicate with other directory services servers. In short, it’s a set of guidelines to send and receive information that is stored on the backend of software or websites.

**Linux**

A free operating system – similar to Windows, but free. Installing Linux on a laptop, replacing Windows, is possible but not a job for nontechnicians. A popular example is Ubuntu.

**Malware**

Malware is short for 'malicious software'. A general term describing software that can cause harm to your computer through spreading computer viruses or accessing your personal information.

**Megabyte**

See ‘Bits’

**Memory** (RAM)

Memory, or more accurately, Random Access Memory, chips are the computers ‘thinking space’. Computer memory can be thought of as similar to human short term memory. It is very much a temporary storage area – to store a file permanently, it needs to be ‘saved’ to a hard drive, memory stick or other storage device. A laptop or desktop computer will typically have between 2 and 8 Gigabytes (Gb) of memory.

**Merge**

To combine two or more files into a single file.

**Microcontroller**

A Microcontroller (sometimes called an MCU or Microcontroller Unit) is a single Integrated Circuit (IC) that is typically used for a specific application and designed to implement certain tasks. Essentially, a microcontroller gathers input, processes this information, and outputs a certain action based on the information gathered. Microcontrollers usually operate at lower speeds, around the 1MHz to 200 MHz range, and need to be designed to consume less power because they are embedded inside other devices that can have greater power consumptions in other areas.

**Microprocessor**

A Microprocessor is an electronic component that is used by a computer to do its work. It is a central processing unit on a single integrated circuit chip containing millions of very small components including transistors, resistors, and diodes that work together. Some microprocessors in the 20th century required several chips. Microprocessors help to do everything from controlling elevators to searching the Web. Everything a computer does is described by instructions of computer programs, and microprocessors carry out these instructions many millions of times a second.

**MPI**

Message Passing Interface. This is a library specification for message-passing, proposed as a standard by a broadly based committee of vendors, implementors, and users.

**Multimedia**

Software programs that combine text and graphics with sound, video, and animation. A multimedia PC contains the hardware to support these capabilities.

**Network**

A system of interconnected computers.

**NFS**

Network File System. This is a client/server application that lets a computer user view and optionally store and update files on a remote computer as though they were on the user's own computer.

**Operating system**

All computers (desktop, laptop, tablet or Smartphone) need an operating system to function.

A computer’s operating system can be thought of as the ‘master’ program on a computer. It keeps track of what the user is doing, where things are stored etc. It is the ‘electronic housekeeper’ keeping everything organised.

Well known operating systems include Windows and Mac OS on desktops and laptops and Android and iOS on tablets and smartphones.

**Output**

Data that comes out of a computer device or computer program.

For example, information displayed on the monitor, sound from the speakers, or videos displayed on the screen.

**PBS**

Portable Batch System. This is a program designed to manage the distribution of batch jobs and interactive sessions across the available nodes in the cluster. Think of this as a project manager: it separates large computing jobs into smaller pieces and makes sure everything is getting done when it needs to be done.

**PC**

A personal computer with Windows as its operating system.

**PDF**

An electronic version of a written document, in many ways similar to a document written in Microsoft Word.

Portable Document Format is a format that allows documents to be shared over a variety of operating systems. Documents can contain words and pictures and be formatted to have electronic links to other parts of the document or to places on the web.

**Peripheral**

Any external device attached to a computer to enhance operation. Examples include external hard drives, scanners, printers and speakers, etc.

**Phishing**

An attempt at identity theft in which criminals direct users to a fake website to trick them into disclosing private information, such as usernames or passwords.

**Platform**

The operating system, such as UNIX, Macintosh or Windows, on which a computer is based.

**Program**

A precise series of instructions written in a computer language that tells the computer what to do and how to do it. Programs are also called software, applications or apps.

**Programming language**

A language that allows a computer programmer to tell the computer what to do in a variety of circumstances.

**RAM**

See ‘Memory’

**Raspberry Pi**

Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. It is a capable little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python. It’s capable of doing everything you’d expect a desktop computer to do, from browsing the internet and playing high-definition video, to making spreadsheets, word-processing, and playing games.

**S3**

Simple Storage Service. This is storage for the internet. An example of this is Apple’s iCloud. Amazon also offers a popular version.

**Scanner**

An electronic device that uses light-sensing equipment to scan paper images such as text, photos, and illustrations and translate the images into signals that the computer can then store, modify, or distribute.

A scanner is like a printer in reverse. It turns a paper copy into an electronic copy of a document or photograph.

**Server**

A computer that shares its resources and information with other computers, called clients, on a network. Servers are large computers where all the websites in the world are stored.

SFTP

Secure/SSH File Transfer Protocol

**Shareware**

Software created by people who are willing to sell it at low cost or no cost for the gratification of sharing. It may be freestanding software, or it may add functionality to existing software.

**Software**

Computer programs; also called applications or apps.

**SSH**

Secure Shell. This is a network protocol that gives users, particularly system administrators, a secure way to access a computer over an unsecured network. This is typically accessed via a command line interface.

**Storage**

Devices used to store massive amounts of information so that it can be readily retrieved.

Devices include hard disks, solid state drives (SSDs), memory sticks, CD-ROMs, DVDs as well as ‘SD’ or ‘micro SD’ cards, typically found in digital cameras, smart phones and tablets.

**Spyware**

An unwanted program that runs on your computer, which can make it slow and unreliable or make you a target for online criminals. Anti-spyware software helps protect your computer against security threats caused by spyware and other unwanted software.

**Taskbar**

The taskbar is the strip at the bottom of a Windows computer screen that shows what programs are running on the PC. It also has the ‘Start button and the ‘notification area’ in the bottom right hand corner of the screen.

**Terabytes** (TB)

See ‘Bits’

**Trojan horse**

See ‘virus’. Storm Worm was a Trojan horse that infected computers, sometimes turning them into zombies or bots to continue the spread of the virus and to send a huge amount of spam mail.

**Upload**

The opposite of ‘download’. The process of transferring information from a computer to a web site (or other remote location on a network).

**URL**

Uniform Resource Locator. Another way of saying ‘website address’

## **Virtual Machine** (VM)

## An operating system instance that runs on top of a hypervisor. Multiple virtual machines (VMs) can run at the same time on the same physical host.

**Virtual reality** (VR)

A technology that allows one to experience and interact with images in a simulated three-dimensional environment.

**Virus**

An unauthorized piece of computer code attached to a computer program or portions of a computer system that secretly copies itself from one computer to another by shared discs and over telephone and cable lines. It can destroy information stored on the computer (deleting files you may have on the computer), and in extreme cases, can destroy operability (delete information that tells the computer how to run). It is wise to have an ‘anti-virus’ program installed on your computer. There are many different types of computer viruses including Boot viruses, File viruses, Macro viruses, Trojan Horses and Worms.

**Worm**

See virus.

# Acronyms

## **CLI**

Command-Line Interface

**CPU**

Central Processing Unit

## **DTN**

Delay-Tolerant Network

## **GPU**

Graphics Processing Unit

## **GUI**

Graphical User Interface

## **HPC**

High-Performance Computing/Cluster

**HTML**

Hypertext Markup Language

**HTTP**

Hypertext Transfer Protocol

**HTTPS**

Hypertext Transfer Protocol Secure

**IP**

Internet Protocol

**ISP**

Internet Service Provider

## **LDAP**

Limited Lightweight Directory Access Protocol

## **MPI**

Message Passing Interface

## **NFS**

Network File System

**OS**

Operating System

## **PBS**

Portable Batch System

**PC**

Personal Computer (specifically with Windows as its OP)

**PDF**

Portable Document Format

**RAM**

Random Access Memory

## **S3**

Simple Storage Service

**SSD**

Solid State Drive

## **SFTP**

Secure/SSH File Transfer Protocol

## **SSH**

Secure Shell

**URL**

Uniform Resource Locator

## **VM**

Virtual Machine

**VR**

Virtual Reality

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