dictionary of multimedia and internet applications: a guide for developers and users. francis botto

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H.320 A standard set of recommendations for real-time audio-visual communications in videoconferencing applications. It was initially formulated for videoconferencing over digital networks such as ISDN.

(See B-ISDN, ISDN and Videoconferencing.)

Hacking A term used to describe an individual (hacker) who endeavours to gain unauthorised and often illegal access to a computer system or network. Up until the late 1970s the term hacker (along with the term chiphead) was used to describe a person interested in computers. The controversial book, *The Hacker's Handbook,* by Hugo Cornwall (a pen name), published by Century Communications in the early 1980s, is considered the first text dealing with the subject. The controversy centred on an attempt by the British government to ban the book.

(See Encryption, Firewall and Security.)

Hand-held scanner *(See Scanner.)*

Hard disk A magnetic mass storage device consisting of fixed disks. Removable versions are available, but most are fixed. Storage capacities are increasing all the time. The usefulness of a standalone PC is greatly enhanced following the installation of a magnetic hard disk drive. This presents a practical solution to re-writable mass storage for the present, yielding data capacities many orders of magnitude greater than can be held on floppy disk. All hard disks must be paired with an appropriate controller, with which they must be 100 per cent compatible. Popular commercial variants include IDE, E-IDE or ATA-2, SCSI, SCSI-2, Fast Wide SCSI, and Ultra SCSI. There are basically three ways in which a controller can be supported. In the first, it is included on the motherboard itself. In the second, it is combined with a hard drive in the form of a hard card where the complete assembly is plugged into an expansion slot. In the third, it represents a single card which

plugs into an expansion slot. Controllers capable of accepting multiple devices provide an economical path to vast data storage capacity in the future. An inexpensive array of drives can be built up, thus lowering the considerable cost of a single high-capacity drive bought at the outset. Whereas a number of drives in an array may exhibit comparatively lengthy access times, it may be more practical to replace them with a single large disk, or several larger ones. More expensive controllers are often expandable in terms of additional daughter boards. For example, SCSI daughter boards can increase the number of drives in standard multiples of seven. Such controllers can easily yield tens of gigabytes using inexpensive drives. Some controllers are also capable of mirroring, i.e. writing the same data to two disk drives simultaneously, thus making the data more secure. Controller technology and performance have advanced considerably in recent years, giving rise to an array of commercial devices ranging from scant MFM implementations to caching variants containing on-board processors. The main thrust of advancement bases itself on the need to expand data capacities, lower access times and increase data transfer rates. In addition, the emergence of multiple device controllers reveals a secondary aim. Cache controllers speed up read/write operations by using on-board RAM as an intermediate data store between disk and system memory. High-performance cache controllers can offer access times as low as a fraction of 1 ms.

(See Cache and RAID.)

Hard disk controller A device that interfaces a hard disk with a computer. Numerous commercial variants exist including IDE, E-IDE, SCSI, SCSI-2, Fast Wide SCSI and Ultra SCSI.

(See Hard disk, RAID and SCSI.)

Hardware event queue A Windows buffer used to store keyboard and mouse events.

Hayes commands **(***See AT commands.)*

HDSL (high bit rate DSL) A data transmission line that uses two pairs of copper wire as its medium. It offers T1 data speeds of up to 1.544 Mbps.

(See ADSL.)

HDTV (high-definition television) An emerging television broadcast technology that produces superior quality images.

Help system An on-line information system that provides guidance on software usage through hypertext, hypermedia or multimedia. Such systems

are usually context-sensitive, so that information regarding a current program operation can be produced immediately. Windows Help systems are essentially hypermedia applications. They can be authored using a word processor that is able to produce standard RTF (Rich Text Format) files together with a Help compiler such as that supplied with Borland programming tools. Numerous other Help compilers exist.

Hertz A unit representing the number of cycles or pulses per second. The alternating current (AC) supply in the UK is distributed at 50 Hz or cycles per second.

Hexadecimal A base 16 counting system that is used widely in computing. Four binary digits may be represented by a single number or letter: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F.

Hierarchical A hypertext structure in which objects are only accessible through a parent object. Hierarchical or tree structures are well known and are normally represented using unidirectional links. Strict hierarchy demands that objects are only accessible through a parent. Compromised hierarchy, however, is less formal, permitting links to bypass children objects.

High-density CD-ROM An initial high-density CD-ROM format introduced by Philips and Sony in the mid-1990s. It was later replaced by the DVD specification.

(See DVD.)

High-level language *(See HLL.)*

High Sierra Group A standard for data storage on CD-ROM agreed at a meeting of industry representatives in 1985 at the High Sierra Hotel at Lake Tahoe, Nevada. Now part of CD-ROM folklore, the meeting resulted in the High Sierra Group (HSG) standard, which introduced compatibility for the storage of alphanumeric data. It has since been built upon to become ISO 9660.

(See CD-ROM and DVD.)

Himem The highest user memory address in a system.

`HIMEM.SYS` *(See XMS.)*

Hit 1. An event when a Web site is visited by a user. 2. In terms of processor cache memory, the hit rate is the percentage of memory requests that can be satisfied by the cache memory.

HLL (High-Level Language) A programming language consisting of easily remembered commands, constructs and statements. OOP (Object-Oriented Programming) languages and visual programming languages are highly evolved HLLs.

(See C++, Java and Visual Basic.)

HMA (High Memory Area) A 64 Kbyte block of RAM located immediately after the 1 Mbyte address line on PCs. Originally Intel intended this to be the first 64 Kbyte of extended memory. The XMS (eXtended Memory Specification) provides a standard means for accessing many megabytes more of extended memory. This is normally achieved using `HIMEM.SYS`.

HMD (Head Mount Display) A display that is worn like a helmet or pair of spectacles. It is generally used to immerse the user in a 3-D virtual environment. Images are presented to the wearer using one of the following display technologies.

- LCDs (Liquid Crystal Displays) of the type used in pocket televisions, and first brought to market by Citizen. Current advantages of LCDs include light weight, compactness of design, low power consumption and their general cost-effectiveness. However their current disadvantages include their comparatively low resolution.
- Miniature CRTs (Cathode Ray Tubes) of the type used by Sir Clive Sinclair in the pocket television of the early 1980s. Sinclair electronics minimised the depth of the CRT by mounting the electron gun in parallel with the phosphor screen. This was achieved using mirrors.
- TFT.
- DSTN.

Current advantages of CRTs include the comparatively high pixel resolution (up to and beyond 1000×1000 pixel elements), and there is greater control of the picture in terms of brightness and contrast. Disadvantages include comparatively high power consumption, their large physical size, their high cost, particularly for high-resolution variants and their weight. Many high-specification HMDs use CRT display technology. Future HMDs will feature VRD (Virtual Retinal Display) technology where images are projected directly onto the eye's retina using low-power lasers.

(See LED, Optical fibre and VR.)

Hoare, Tony An Englishman responsible for the design of the Communicating Sequential Processes (CSP) programming model, upon which the Occam concurrent programming language is based.

(See MPP and Occam.)

Home page The highest level page in the hierarchy of Web pages at a Web site. It has a URL such as www.homepage.com. A home page may consist of a single page or a number of linked pages. It may include links to other sites, graphics, sound bites, video, an e-mail address and various forms for user feedback; it may also include a counter that records the number of hits or times it is visited.

(See ActiveX, DHTML, HTML, HTTP, Java*, Visual InterDev and Web.)*

Host-based processing An architecture where a host computer is connected to dumb terminals. Typically the terminals do not have GUIs such as Windows, but are text-based. They are sometimes termed green screens, because many earlier terminals had screens bearing green phosphor. The terminals are said to be dumb because they lack processing capabilities. They merely accept user commands, pass requests to the host and receive information from the host. Many host-based processing architectures are being renovated or migrated to client/server architectures. A coexistence strategy is also being adopted, using mainframe and client/server-based architectures to form collective IT solutions.

(See Application renovation, Client/server and Mainframe.)

Host name A name designated to a network device, which permits it to be addressed without using its full IP address. The Internet Request for Comments (RFC) No. 1178 provides guidelines for naming hosts. Using host names there is a requirement to perform translations between host names and their respective IP addresses, using a lookup file containing host names and related IP addresses, or the Domain Network Service (DNS).

(See IP address and TCP/IP.)

HotDog Pro A Web site development tool.

(See CGI, HTML and Web server.)

HotJava A Web browser produced by Sun Microsystems. It does not enjoy the popularity of Netscape Navigator or Microsoft Internet Explorer, but is nonetheless equally sophisticated.

(See Browser.)

HIPPI (High-Performance Parallel Interface) An 800 Mbps interface initially used to connect supercomputer networks; it was developed by ANSI under the name *high-speed channel.*

(See Fibre channel.)

HP-UX A Unix operating system variant.

HTML (HyperText Markup Language) A standard language consisting of formatting commands and statements that can be used to create Web pages. HTML may be used to include hyperlinks leading to Web pages, frames or sites, and many other functions including visitor counters. HTML has its roots in SGML, and is the standard language of the World Wide Web. When the Web was first introduced, almost all Web sites depended heavily on HTML. Today, however, HTML is almost a framework used to hang other components, such as:

- ActiveX controls
- Java applets
- JScript programs
- VBScript programs.

The HTML syntax is similar to old text formatting languages such as LaTeX and even that which was included in the Borland Sprint word processor. The Web browser interprets the HTML first by reading the *tags*:

```
<HTML>
<HEAD>
<BODY>

</BODY>
</HEAD>
</HTML>
```

These basic tags form the basis of all HTML listings, and encapsulate such entities as VBScript code, JScript code, ActiveX Controls and Java applets. Such components are enclosed between the `<BODY>` tags.

(See DHTML and Web.)

HTML Help An on-line Help development tool from Microsoft.

HTML template A template file that a Web server uses to display information. The information may originate from a query submitted to a database.

(See HTML.)

HTTP (HyperText Transfer Protocol) A standard protocol that allows Web browsers to communicate with Web servers. The transport protocol is provided by TCP/IP.

(See HTML, TCP and Web.)

Huffman coding An image compression process which operates in the spatial domain and forms part of the JPEG algorithm.

Hybrid CD-ROM/DVD-ROM A CD-ROM or DVD-ROM which possesses hyperlinks to Web pages, as well as having its own data and media files. For example, MPEG-2 video might be stored on the DVD-ROM for improved video quality, while text, graphics and other less dynamic content may be stored on the Web.

(See CD-ROM and DVD.)

Hyper A fashionable prefix in computer terminology that means 'more than' or 'greater than', and is particularly appropriate when considering hypertext and hypermedia.

(See Hypermedia and Hypertext.)

HyperCard A program for the Macintosh which permits the delivery and development of hypertext and hypermedia. Supplied with all Macintosh computers, it represents a milestone in the development of multimedia. (HyperCard is obtainable at a nominal fee through any Apple dealer.)

Hyperlink A link in a hypertext-based navigational scheme that permits the user to browse from one document to another, or from one Web site to the next.

Hypermedia An extension of the hypertext concept where text is combined with images. The terms hypermedia and multimedia are often regarded as interchangeable but they are *not*. In French media circles the ludicrous and ridiculously extravagant term hypermediatisation was coined in 1991. It was used to describe the immediacy with which news began to be transmitted, brought about by satellite broadcasting technology. With the time normally required by the reporter to prepare an informed report sacrificed, the concept of the resulting often confused reports became known as hypermediatisation. Available to Macintosh users through HyperCard since 1987, hypermedia is a relatively mature area of multimedia. HyperCard for the Apple Macintosh can be considered as the

earliest commercially successful hypermedia authoring tool that combined text, graphics, animated sequences and sound. It made the Macintosh an effective personal computer for multimedia. A plethora of hypermedia authoring tools has since emerged, including ToolBook for the Microsoft Windows environment on the IBM PC and compatible machines. Hypermedia applications developed using such tools can be thought of as interactive books that combine images, text and sound.

Hypertext 'It seemed so clear to me right from the very beginning that writing should not be sequential... the problems we all have in writing sequential prose derive from the fact that we are trying to make it all lie down in one long string ... if we could only break it up into different chunks that readers could choose ...' (Ted Nelson)

A term coined in the 1960s by Ted Nelson to describe the concept of linking textual information and presenting it in a non-linear fashion so that it can be navigated and browsed. The Web is synonymous with hypertext. Just as modern multimedia led to a re-evaluation of the way we communicate information in the 1980s and 1990s, hypertext had a similar impact in the 1960s. In a few cases, the birth of what is now known as hypertext also had a similar effect in the 1940s. The rationale behind the development of hypertext was a simple one: to optimise the processes of writing and storing textual information and accessing that information. It improves accessibility of stored information by eliminating the need to follow rigorous set sequences. It allows the user to reference masses of related material through the pursuit of *ad hoc* paths. The advantages of this are easily understood when considering traditional methods. A word unknown to the reader of a book first leads to the index being searched. Failing this, the reader naturally attempts to find a reference to the word in another book. The many references required to research a subject or satisfy curiosity are time-consuming. With information linked, indexed and stored on computer, hypertext expedites this process and gives users the opportunity to take regular excursions to satisfy references. It also makes information available that would not otherwise occur to the casual reader. The word 'car', for instance, might be linked to numerous options, such as: combustion engine, Henry J. Ford, Detroit, Rolls-Royce, catalytic converter and a whole host of relevant texts. Hypertext is equally useful when writing or simply arranging gathered information. An appropriate hypertext tool can be used to implant and manifest links between related items of text automatically. See the following works.

Botto, F., *Multimedia, CD-ROM and Compact Disc – a guide for users and developers* 2nd Edition, Sigma Press, 1993.

Botto, F., *PC Multimedia: An Introduction to Authoring Applications*, Butterworth-Heinemann, 1995.

Woodhead, Nigel, *Hypertext & Hypermedia,* Addison-Wesley, 1990.

(See Multimedia and Web*.)*