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

Print ISBN 0-471-98624-0 Online ISBN 0-470-84178-8

F

Failover A contingency measure which provides an alternative service provider should a failure occur.

FAQs (Frequently Asked Questions) A list of questions asked most often by users or developers.

FAT32 (File Allocation Table) A filing system used by the Windows 98 operating system; it is an enhancement of the FAT16 implementation. It is more efficient than FAT16 because it uses smaller clusters, which are used to store files. FAT32 clusters may be:

- 4 Kbyte for drive capacities between 260 Mbyte and 8 Gbyte
- 8 Kbyte for drive capacities between 8 Gbyte and 16 Gbyte
- 16 Kbyte for drive capacities between 16 Gbyte and 32 Gbyte
- 32 Kbyte for drive capacities that are greater than 32 Gbyte.

Each cluster is confined to data from a single file. The larger 32 Kbyte clusters typically used by FAT16 (on relatively small drives) are comparatively inefficient. For example, when a 34 Kbyte file is written to the hard disk, two 32 Kbyte clusters are used. The second cluster has some 30 Kbyte of unused payload. So even though the file is just 34 Kbyte, it consumes 64 Kbyte of hard disk, which equates to two of its 32 Kbyte clusters. Clearly, FAT32's dependence on 4 Kbyte clusters (on smaller drives) helps eradicate the unused data capacity of clusters. This yields considerable storage capacity gains. The disadvantage of using FAT32 is that it prevents the use of DoubleSpace when using Windows 98.

(See Hard disk.)

Fat client A system within a client/server architecture (such as that of the Web) that features:

- presentation, which is typically in the form of a Web browser
- complete application(s)

- a data cache, which is used to store information from a server-side database or back-end database.

Many systems connected to the Web may be described as thin clients. Fat clients depend heavily on client-side processing and resources, while thin clients do not. This higher demand for hardware results in higher client system costs. Generally fat clients may integrate:

- improved intelligence, because the user's interaction can be personalised through the local customisation of the application; additionally, intelligence features such as those associated with KBSes are more feasible
- additional local applications, such as industry-standard products from companies such as Microsoft, Lotus and Inprise.
- data verification prior to sending messages to the client side, thus improving system responsiveness while reducing network traffic
- security on the client-side, through password checks and restricted access to documents, data and applications.

(See Application software, Client/server, KBS, NC and Thin client.)

FDDI (Fibre Distributed Data Interface) A computer-to-computer fibre link technology and an internationally agreed ANSI standard. The topology comprises a dual multi-mode optic fibre, LED (or laser) and Token Ring network. Data rates of up to 100 Mbps are possible. Without repeaters, transmission distances up to 2 km are attainable at a data transfer rate of 40 Mbps.

(See LED and Optical fibre.)

Fibre channel A high-performance communications pathway which was introduced by the Fibre Channel Association (FCA). An open standard, it is a protocol that supports data transfer rates from 133 Mbps up to 200 Mbyte/s. Fibre channel can be used to connect sites up to 10 km apart using a 9 micrometre single mode optic fibre. The fibre channel protocol may also propagate along traditional copper-based transmission media such as miniature coax and shielded twisted pair. Typical data transfer rates, and maximum transmission distances for a 9 micrometre single-mode optic fibre are:

- 100 Mbyte/s 10 km
- 50 Mbyte/s 10 km
- 25 Mbyte/s 10 km

For a 50 micrometre multimode optic fibre:

- 100 Mbyte/s 0.5 km
- 50 Mbyte/s 1 km
- 25 Mbyte/s 2 km

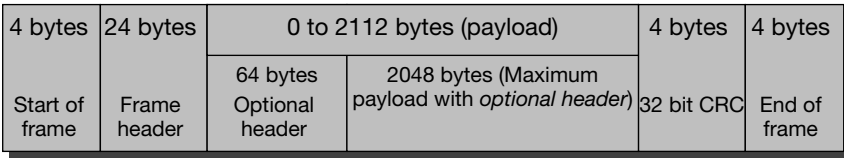
For a 62.5 micrometre multimode optic fibre:

- 25 Mbyte/s 500 m
- 12.5 Mbyte/s 1 km

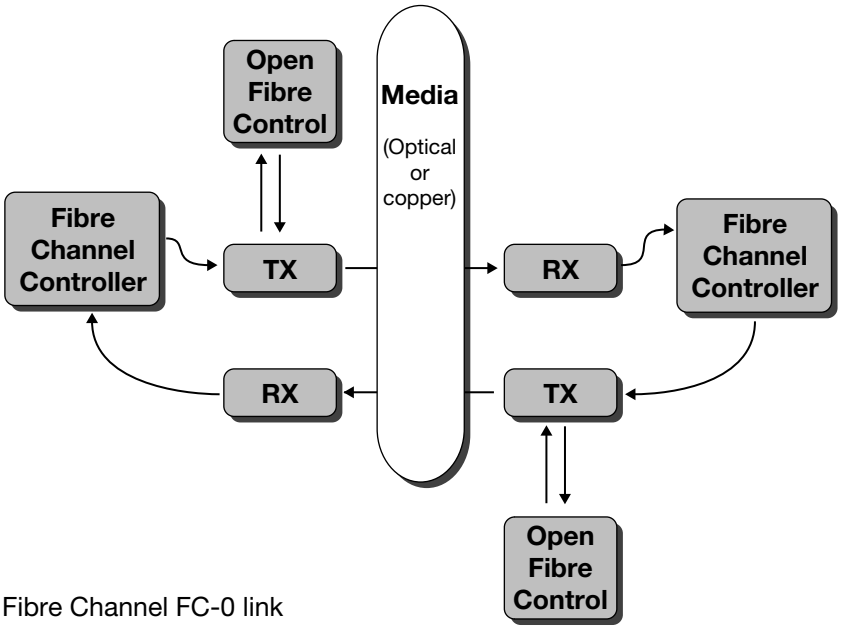
For video coax:

- 100 Mbyte/s 10 km
- 50 Mbyte/s 10 km
- 25 Mbyte/s 10 km

Applications of fibre channel include mass storage interface and control and high-speed networks. Network topologies may be point-to-point, ring or a Fibre Channel–Arbitrated Loop (FC–AL), which requires neither switches nor hubs. Frames are used to send and receive data, each having the fields:



Fibre channel frame format



Fibre Channel FC-0 link

- start-of-frame delimiter
- frame header
- optional header
- payload, which is the user data, and may be between 0 and 2112 bytes
- 32 bit CRC error detection
- end-of-frame delimiter.

The Fibre Channel Physical (FC-PH) standard consists of the levels:

- FC-0, which covers physical media, cables connectors, LEDs, short- and long-wave lasers, transmitters and receivers
- FC-1, which covers the encoding and decoding protocol, to cater for the adopted serial transmission techniques
- FC-2, which covers the signalling protocol and defines the shown frame format (or *framing protocol*) for data transfer.

Upper FC layers include FC-3, whose common services include:

- *multicast*, for transmissions to multiple destinations
- *striping*, for transmitting to multiple N_ports concurrently, supporting multiple links
- *hunt groups*, which are a collection of N_ports, assigned an alias; frames containing the alias are routed to any non-busy N-port within the defined group.

Upper layer protocols (ULPs) are defined by FC-4, covering industry network standards, which may be transported using fibre channel. These include:

- Internet Protocol
- ATM Adaption layer
- IEEE 802.2

Channel protocols supported by FC-4 include:

- SCSI (Small Computer Systems Interface.)
- High-Performance Parallel Interface (HIPPI) framing protocol
- Intelligent Peripheral Interface (IPI)
- Single Byte Command Code Set Mapping (SBCCM).

(See Access technology, ADSL, ISDN and LED.)

Fibre optic *(See Optical fibre.)*

Field A column in a database table or a container for data entry in a form. Entries within fields are termed field values.

(See Data warehouse.)

Field value A data item in a database.

FIF (Fractal Image Format) An image compression technique.

FIFO (first in, first out) A queue whose operation hinges on regurgitating items in the order in which they were deposited. An analogy is that of a vending machine used to sell chocolate bars, which are stored in a vertical dispensing tube.

Fifth-generation language Fifth generation languages are non-procedural. They are declarative in that actions are not implemented through fixed procedures. They are also known as AI languages and include PROLOG (PROgramming LOGic).

(See AI.)

File Manager A program which forms part of Microsoft Windows 3.x and performs multiple roles, including file management and browsing and network management. Network features are available in the Windows for Workgroups version of File Manager. The Windows 95 (and later) and NT version also has network features, but the File Manager is renamed Explorer.

(See Explorer.)

Find and Replace A phrase used to describe the automated process of replacing a specified word or phrase with another. The phrases find and replace and search and replace are interchangeable.

Firewall A software/hardware implementation that partitions a network or system, so restricting access to selected users; it appropriately isolates a network. A firewall may be perceived as physically existing

- between the Web server(s) and the ISP's physical site, or
- between the network and the Internet, or
- between one or more networks.

It may perform the simple functions of checking client connections and requests and securing server-side applications and data. The firewall's collective components may intercept inbound data packets and perform a number of security checks. These may revolve around the origins of the packet, checking such packet information as its:

- source IP address
- source IP port, which identifies the originating application.

Firewalls are vital to many organisations' security strategies. Other adopted security facets include:

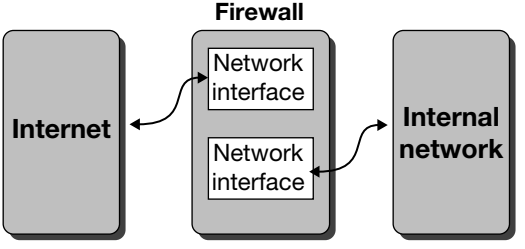
- passwords for logging on to networks
- client-side password checks for connecting to Web sites

- client-side password checks for connecting to e-mail applications and services
- password-protected compressed hard disks, made possible using Stac Electronics disk compression programs.

Firewalls may also include the ability to virus check and to screen incoming documents and executables such as ActiveX controls, plug-ins, Java applets and any other code which is downloaded and intended to be processed. Cookies may also be filtered. Firewalls may be at the network level, harnessing packet filtering techniques using routers. The routers are intelligent in that they may be programmed to behave as a selective barrier to unwanted network traffic.

Dual-homed host firewall A dual-homed host has two network interfaces, which connect with disparate networks, while a multi-homed host typically interfaces with two or more networks. The term *gateway* was used to describe the routing functions of such dual-homed hosts. Nowadays the term *gateway* has been replaced by *router*. A dual-homed host can be used to isolate a network, because it acts as a barrier to the flow of TCP/IP traffic. The implementation of a Unix dual-homed firewall requires (among other things) that:

- IP forwarding is disabled, thus yielding a protective barrier
- unrequired network services are removed
- programming tools are uninstalled.



Firewall – in the form of a dual-homed host

Bastion host A host that is critical to a network's security. This is the focus of network management and security monitoring, and is a network's principal defence against illegal use. A dual-homed host may play the role of a bastion host.

Screened subnets A subnet which restricts TCP/IP traffic from entering a secured network. The screening function may be implemented by screening routers.

Commercial firewall products include

- FireWall-1, which is a commercial gateway product, from the Internet Security Corporation, and uses:
  - application gateway
  - packet filtering

- *ANS InterLock*, which is a commercial gateway product from Advanced Network Services
- *Gauntlet*, which is a firewall product from Trusted Information Systems

(See ATM, Cookies, Encryption, Packet filtering, Risk exposure, Screening router, Security, Security gateway, SET, Stacker and Subnet.)

Firewire A high-performance interface which permits the connection of peripheral devices such as mass storage devices, modems and printers. It is otherwise known as IEEE1394, and as such it is an internationally agreed standard.

(See Fibre channel and SCSI.)

Firmware A program or data stored using a ROM variant (*see EAPROM, EPROM*, *PROM and ROM*). Firmware is thus involatile and permanent.

First-generation language First generation computer languages require the entry of code in a hexadecimal form (*see Hexadecimal*). A collection of instructions entered in 'hex' represents a first generation language, and the system upon which it runs may be described as a first generation computer. Such languages are obsolete.

Fisheye browser A browser, or feature thereof, which emphasises nodes in close proximity or of relevance.

Flatbed scanner *(See Scanner.)*

Floating-point data types A data type that may represent fractional numbers, which may be the:

- float type, which is allocated a 32 bit single-precision number
- double type, which is allocated a 64 bit double-precision number.

Such data types are implemented in C++ using statements of the form:

```
float altitude;
double angle, OpenRoad;
```

Floppy disk A magnetic storage medium typically of 3.5in or 5.25in in diameter. Standard versions store between 360 Kbyte and 1.44 Mbyte for the IBM family of computers.

Flowchart A symbolic representation of the flow of program execution. Flowcharts can also be applied to objective decision making, such as choosing a computer, sound card, monitor or anything in fact. Windows programs capable of generating flowcharts including Visio, ABC Flowchart and AllClear.

Flow control A buffering technique that can be used to enhance the DTE rate using modem-based communications.

FMFSV (Full Motion, Full-Screen Video) A term used to describe video that can be assumed to fill the entire screen, or the greater part of it, and which provides the illusion of a frame rate of not less than 25 frames per second (fps) without the use of duplicated frames. MPEG-2 or DVD video is FMFSV. 25 fps is the frame rate delivered by PAL and SECAM broadcast standards. The American NTSC broadcast standard provides 30 fps. Ideally the frame rate should be greater than 25–30 fps. The frames that make up an FMFSV can be full frames, as in the case of an M-JPEG video stream or a combination of full frames and partial frames, as is the case with MPEG video. The full frames or reference frames occur at regular intervals and dictate the number of authentic random access points provided by an encoded MPEG video sequence. The frame resolution of what can be described as FMFSV varies, but it should not fall below 720 × 360 pixels. Larger standard frame resolutions may broadly equate to 640 × 480 pixels, 800 × 600 pixels, 1024 × 768 pixels, 1240 × 1024 pixels and 1600 × 1240 pixels.

(See MPEG and Video*.)*

Folder A metaphor for a directory. Folders are used to store files, which are usually of a specific type.

Form 1. A metaphor for a paper form, used by client browsers in order to interact with programs and data that may be on the client- or server-side. Typically forms permit users to enter:

- signup details with Web sites
- contact details
- password details
- credit or debit card details for purchase from e-commerce sites.

(See MCIS.) 2. A metaphor for a paper form, used for data entry and viewing data in a database. RDBMS development tools, such as Access, DataEase for Windows or Paradox for Windows, may be used to create table-based applications. *(See Data warehouse and DBMS.)* 3. A data sector type on a CD-I disc. Like CD-ROM blocks, CDI sectors are 2352 bytes long, including headers, sync information, error detection and correction data. Like a Mode 1 block, a Form 1 sector yields 2048 bytes user data. Unlike a Mode 2 block, however, a Form 2 sector yields 2324 bytes user data. *(See Data capacity and Mode 1 and Mode 2.)*

CDI sector structure

	Form 1	Form 2
Synchronisation bytes	12 bytes	12 bytes
Header bytes	4 bytes	4 bytes
Subheader bytes	8 bytes	8 bytes
User data	2048 bytes	2324 bytes

(See CD-I.)

Fourth-generation language *(See 4GL.)*

fps (frames per second) A measure of the speed at which the frames making up a video sequence are played or captured.

FPU (Floating-Point Unit) A set of registers and instructions able to make decimal calculations.

Frame 1. A tiled area of a browser's window. A frame provides an efficient method of presenting information without using a separate Web page. For example, a frame might be used to play a video sequence or animation. A frame-enabled Web application reduces the complexity of designing multiple pages at design time, and is toured more easily by users. Frames are supported by many Web page design and Web application development tools, such as Microsoft FrontPage. *(See Microsoft FrontPage and Visual InterDev.)* 2. A single image making up a video sequence. Digital video sequences may consist predominantly of partial frames, called interframes, or full frames, called intraframes. *(See MPEG* and Video*.)* 3. A single item of transmitted data using the frame relay protocol, which is designed for modern digital networks and does not integrate the demanding error detection and correction schemes prevalent in older protocols. *(See Frame relay.)*

Frame grabber A device used for digitising still or single frames of video. Video capture cards often comprise a frame grabbing feature. For example, manual step-frame capture is equivalent to frame grabbing.

Frame relay A protocol designed for modern communications networks. Typically it may be operated at speeds between 9600 bps and 2 Mbps, though higher speeds are possible. Compared to X.25 it makes better use of network bandwidth as it does not integrate the same level of intense error detection and correction. That is not to say that frame relay is unreliable; it is simply optimised for modern networks which do not

impose the same level of error on transmitted data, which is the case with the older network technologies for which X.25 was designed. The frame relay protocol may be applied in WAN and backbone implementations, and integrated into solutions that require high data transfer speeds. Each frame consists of:

- a flag, which separates contiguous frames
- an address field, which stores the data link connection identifier (DLCI) and other information
- a control field, which contains the frame size and receiver ready (RR) and receiver not ready (RNR) information
- an information field, which contains up to 65 536 bytes
- a frame check sequence, which is a CRC for error correction.

(See CRC and X.25.)

Framework A suite of interfaces, and code, which define the behaviour of objects or components in an application. The application may be local or a client/server implementation.

Freeware A program that is not sold to users, but distributed free of charge.

(See Shareware.)

Front-end A name given to the client application or system, which may be served by a server-side or back-end application. Between the back- and front-end applications is middleware or *glues*, which exist at a number of levels. These may bind together and coordinate application logic, data and presentation distributed across the back- and front-ends.

(See Application software, Back-end, Client/server and Glue.)

FTP (File Transfer Protocol) A protocol used to transfer files between FTP servers and client systems. It is a standard method for distributing files across TCP/IP networks. Using an FTP client program, users are able to link with FTP sites and browse the remote directories and files as if they were on a local hard disk. Users can then download files from the FTP server.

(See Anonymous FTP.)

Full duplex A simultaneous bi-directional transmission of different data streams.

Full frame updates A video sequence that is composed of full frames. Any such frame can provide a valid entry point for non-linear playback or editing. Such video sequences are also known as intraframe sequences.
(See M-JPEG and MPEG.)*