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A

A / B Slider: An A/B slider in Media Cleaner's Dynamic Preview window which allows you to compare your processing and/or compression settings by moving it back and forth in real time.

Absolute Path: The absolute path is the directions to a given folder, page, graphic, etc. as expressed in complete (not relative) coordinates. For example, "http://www.terran.com/media/Presentation.mov" is an absolute path. Absolute paths are often used to reference items which are on different servers from the page referring to them, such as movies located on a streaming server.

Adaptive Noise Reduction Filter: The ANRF is an "intelligent" noise filtering system that analyzes each pixel and applies an appropriate filter to remove the noise. This maintains edge detail while improving compression.

ADSL - Asymmetric Digital Subscriber Line: High-speed Internet connection technology which enables high speed connections over existing telephone lines. ADSL is not widely available to the general public as of this writing, but many believe it will be very popular for Internet access in the next few years.

Alpha Channel: The AC is an additional image channel which is often used to store transparency or compositing information. Alpha channels are often 8-bit, but some applications support 16-bit alpha channels. Only certain formats, such as PICT and the QuickTime Animation codec, support alpha channels.

Alternate Movies: QuickTime 3 option which allows you to create multiple versions of a movie and set criteria for when the QuickTime Plug-in should display the various versions.

Analog-to-Digital Converter (A/D): This is a chip which converts analog video signals to digital signals. Analog-to-digital converters are used on capture cards to change the video into a format that the computer can better manipulate and store.

Architecture - see "Multimedia Architecture"

ASF - Active Streaming Format: This is a standard file format of Windows Media files.

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ASX: Windows Media reference file which is placed on the HTTP server, and gives the Media Player the location of the ASF file on the NetShow server. ASX files can contain references to multiple movies, different content locations, temporal aspects and more.

Asymmetric Codec: A codec which takes longer to encode than decode. For example, Sorenson Video is extremely asymmetric because it takes many times longer to encode a video frame than it does to play the same frame.

ACK: An acknowledgment packet telling the source computer that the destination computer has received the message packet.

Aliases: A duplicate hostname for a computer.

ActiveX (aka DCOM): A technology developed by Microsoft for sharing information among different applications. ActiveX is not a programming language, but rather a set of rules for how applications should share information. Programmers can develop ActiveX controls in a variety of languages, including C, C++, Visual Basic, and Java. An ActiveX control is similar to a Java applet. Unlike Java applets, however, ActiveX controls have full access to the Windows operating system.

API: Abbreviation of application program interface, a set of routines, protocols, and tools for building software applications. In the context of Web-database connectivity, API's are used to integrate database applications directly into the Web server process, avoiding the overhead associated with CGI.

Architecture: in Intranet terms includes your information model, your equipment arrangement, your range of services, and your means, whether human or digital, of getting information in and out of those services.

Archival Inks: Inks used in fine art reproduction that have been optimized for permanence.

Archiving: Images are archived, often on CD_ROM, for a specific period. Information necessary to reproduce the art is also archived, including ink, table, sizes and media used.

Artist Proof: Frequently, an edition will include a number of prints called Artist Proofs, or AP's. These proofs are normally printed at the time of the initial printing of the edition and are outside of the numbered series. APs frequently sell for more than prints from an edition.

ASCII: American Standard Code for Information Interchange.

Asynchronous Transfer Mode (ATM): is another high performance network system approach that allows packets to be sent via disparate lines at disparate times. Each packet can then attempt to find the most efficient route at any given moment in time.

Attributes: Information which may be provided about elements which is in addition to the element name and its content.

absolute values: Position and orientation within a virtual space as measured from a single, constant point of origin. If a real or virtual object is moved, its previous coordinates are ignored, and new position and orientation measurements are taken. **accommodation:** Change in the focal length of the eye's lens to maintain focus on a moving close object.

actuator: Usually mechanical (hydraulic) or electric means used to provide force or tactile feedback to a user.

ambient light: Naturally occurring illumination arising from outside the apparatus (e.g., HMD).

Articulation: Objects composed of several parts that are separately movable.

artificial reality: Simulated spaces created from a combination of computer and video systems. Coined by VR pioneer Myron Krueger in 1974.

aspect ratio: Ratio of width to height of the field of view.

assistive agents: Artificial intelligence algorithms developed to guide participants through a VR world, and to coach on available choices within the world.

augmented reality: The use of transparent glasses on which a computer displays data so that the viewer can simultaneously view virtual and physical

objects.

avatar: A participant's graphical persona inside a virtual world.

B

back clipping plane: A distance beyond which objects are not shown.

backdrop: The stationary background in a virtual world. The boundary of the world which cannot be moved or broken into smaller elements.

backface removal: The elimination of those portions of a displayed object that are facing away from the viewer.

bi-ocular: Displaying the same image to each eye. Sometimes done to conserve computing resources when depth perception is not critical. See also: stereoscopic.

biosensors: Sensor devices that monitor the body's electrical activity for the purpose of computer input.

Bandwidth: The amount of information that can be sent, processed, etc., in a given amount of time. For example, a double-speed CD-ROM drive has a maximum bandwidth of 300 KBps; a 28.8 modem has a theoretical bandwidth of approximately 3 KBps.

Batch Compression: This is a grouping of two or more movies together to be compressed sequentially, so that each compression doesn't need to be started manually.

Batch List: A specific list of movies to be compressed in a batch, as well as the settings with which each movie will be processed.

Batch Log File - text file which reports the results of each compression, including any problems that occurred. It may be viewed with a text program such as SimpleText.

B-frame - Bi-directional frame - MPEG difference frame which is based on both the previous and next frame. Similar to a QuickTime delta frame, only with the ability to see what's ahead.

Binhex - MacOS encoding scheme which converts normal computer files into ASCII (text) characters for transmission over the Internet. Binhexed files normally end with ".hqx", and must be returned to their binary format prior to use.

Bit: - Binary Digit - unit of measure for computer data. A bit is a single computer digit (either a "1" or a "0"). Eight bits make a Byte, which holds a single character of most languages.

Bitmap: - collection of pixels that make up an image. Often used to distinguish images which are pixel-based as compared to images which are vector-based.

Blur: A filter which averages pixels together to soften the image, and can be used to minimize subtle frame-to-frame differences. Normally when compressing movies, you will get better results with Media Cleaner's Adaptive Noise Reduction filter.

Bottlenecks: - points in a system that are slower than the rest of the system, causing overall delays. In the Internet, bottlenecks are often caused by localized problems, such as overloaded switching complexes, slow modems, etc.

Broadcast - used to refer to signals intended for delivery over the television system, as well as network delivery to a wide audience.

Burn - changing a text or sprite track into an image in the video track. Often used as a work-around to the fact that QuickTime for Windows 2.1.2 does not support text or sprite tracks.

Byte - computer data unit, which represents a single character in most languages. One Byte is made up of eight bits.

Bandwidth: A measure of the amount of data that is moving on a network. As the current bandwidth increases to the theoretical maximum bandwidth, effective bandwidth decreases.

Bi-directional hyperlink: A hyperlink where both ends are both sources and

destinations.

Binary: The basic numbering system for calculations, codes, and data in all computers, consisting only of the digits 0 and 1, in contrast to the 10-digit decimal system.

Bounced: An e-mail message is 'bounced' or returned back to you if it cannot be delivered for some reason. This is one reason why having a correct return or 'from' address is important.

Bon-A-Tirer or BAT: The proof accepted by the artist that is used as the standard for comparing all subsequent prints. Some printers require a signed BAT before production printing can begin.

C

C: compiled procedural language. Compiled programs are turned into object code (not to be confused with object-oriented), and then linked to related libraries, and are then ready to run at any time.

Cable Modem: - special modem designed to operate over cable TV lines to provide extremely fast access to the Internet. As of this writing, availability is limited, but is expected to increase in the next few years.

CCIR601: - standard resolution specified by certain formats, including DV. CCIR601 can be 720x486 or 720x480.

CD-ROM: - Compact Disc - Read Only Memory - ubiquitous delivery medium used for distribution of computer software, particularly multimedia.

Chapter List: - QuickTime feature which allows users to click on a pop-up to jump to selected points in the movie.

Chrominance: - color component of an image.

Cinemascope: - very wide (2.21:1) aspect ratio which is one of the standards in MPEG-2. When displayed on a normal television, Cinemascope material requires pronounced "letterboxing" (black bars on top and bottom).

Cinepak: The commonly used codec for CD-ROM video compression. Allows temporal and spatial compression, as well as data rate limiting. Newer codecs, such as Sorenson Video, offer superior image quality and features, but Cinepak is still used for backwards compatibility.

CLUT: Abbreviation for Color Lookup Table. See "Palette"

CMYK: Cyan Magenta Yellow Black - color space commonly used for images which will be printed with 4-color ink on offset presses.

Codec: Compressor/decompressor. Software component which translates video or audio between its uncompressed form and the compressed form in which it is stored. Sorenson Video and Cinepak are common QuickTime video codecs. Also called a "compressor".

Color Depth: The possible range of colors that can be used in a movie or image. There are generally four choices with video: Grayscale, 8-bit, 16-bit, and 24-bit. Higher color depths provide a wider range of colors, but require more space for a given image size.

Color Lookup Table: - see "Palette"

Color Space A mathematical model which describes colors. Common models include RGB, CMYK, HSV and YUV.

Color Subsampling - method of reducing the size of an image by storing color data with lower resolution than luminance data. Typically used in video with the YUV color space. Common subsampling options include 4:2:2, 4:1:1, and YUV9.

Color Table - see "Palette"

Compression - process by which files are reduced in size by the removal of redundant or less important data. See also "Lossy" and "Lossless"

Compressor - see "Codec"

CPU - Central Processing Unit - processor chip in a computer. Also used to refer to a computer in general.

CPU - Intensive: This describes processes which use large amounts of processor power. CPU-intensive processes tend to tie up the computer while they are running, and not work well on slower machines.

CALS (Continuous Acquisition and Life-cycle Support): A very large U.S. Department of Defense program to, among other things, use electronic information systems technology to reduce procurement and maintenance costs of weapons systems. SGML is one of the key components in the CALS initiative. CALS helped to stimulate the growth of the SGML industry and also supported the development of several key reference standards in such areas as technical publications, tables, and interactive electronic technical manuals.

Cache: This is a designated area of hard-disk or memory which holds commonly referenced information.

Chaos: A state of apparent cattywompus. Chaotic systems are not really random, but are sufficiently complex as to appear so. Most chaotic systems have their own rhyme and reason which may seem inscrutable.

Character Set: The mapping of computer codes to a set of symbols such as letters and punctuation. Japanese and English, for example, use different character sets (although an attempt is underway to establish a single character set, known as Unicode, for all languages).

Checksum: A checksum is a mathematical method to ensure that data that has been transmitted has not changed by the transmission.

Common Gateway Interface (CGI): Standard mechanism for holding and manipulating variables in a Web application.

Content Model: In an SGML Element definition, the definition of possible content for that element including children and textual or non-textual (for example, graphic) data. The content model is based on regular expression syntax which permits great flexibility and conciseness in stating all possible permissible combinations of child elements and data.

Check-In/Check Out: Enables collaborative authoring by enabling only one person at a time to work on a document (check-out). When a document is "checked-in" the repository is updated and the document may be checked-out by another author. In an SGML system check-in/check-out is implemented at the document component level so it is possible for authors to work on different parts of the same document.

Chunking a Document: Means breaking it into smaller documents. This is a band-width friendly, not to mention user-friendly, way to present information.

Client: A software application that runs on a desktop computer and accesses a server process for information.

Coating: A clear coating provides protection from smudging, fingerprints, and water droplets. It does not improve the performance of the print because most fading is due to visible light. On some material, such as canvas, coating can render a print water-resistant, allowing it to be framed without glass.

Collaborative Authoring: The creation of information collaboratively; multiple authors working on a single document, possibly simultaneously.

Color Management: An advanced technology that uses profiles of the input and output devices to maximize color accuracy. Targets that include over 3,000 colors are printed and measured with a colorimeter to create profiles for the various ink/media combinations.

clue conflict: A kind of motion sickness caused when the body tries to interpret conflicting clues being received by the senses. Usually attributed to faulty calibration of eye devices or delay between the sensory inputs and output display.

concept map: Terms, definitions, or icons arranged in semantic proximity.

convergence: Occurs in stereoscopic viewing when the left and right eye images become fused into a single image.

convolve: To filter and intertwine signals (e.g., sounds) and render them three-dimensional. Used in VR applications to recreate sounds that give directional cues.

coordinates: A set of data values that determine the location of a point in a space. The number of coordinates corresponds to the dimensionality of the

space.

culling: Removing invisible pieces of geometry and only sending potentially visible geometry to the graphics subsystem. Simple culling rejects entire objects not in the view. More complex systems take into account occlusion of some objects by others, e.g. a building hiding trees behind it.

D

Digital Certification: This is the process of trusted third-party electronic verification of an organization's identity.

Digital Signature: A pattern in a digital print that shows the breakdown of an image into individual segments, such as pixels.

DNS: Domain Name Service. A client/server process for acquiring the IP address that belongs to a hostname.

Distribution Lists: Electronic version of traditional mailing lists. A distribution list is simply a list of names and associated electronic addresses grouped together for group mailings. The reason the names are associated are varied; perhaps the members belong to the same department, project, classification of employee, or are persons interested in a particular subject matter. In company-wide e-mail environments, the systems administrators often set-up distribution lists to meet company defined groupings of employees. Additionally, individuals may set up personal distribution lists to facilitate individual mailings to personally defined groups of people. Individual distribution lists are often housed in an electronic Personal Address Book.

Document: A document can be word processing file, a spreadsheet, a project management schedule, a graphics file, a CAD or engineering drawing, paper scanned as an image, a slide show presentation, audio and even video, or any similar item (use your imagination) that can be contained in a electronic file. Some document management systems allow you to manage external items that aren't electronic files. For example, you could manage & track a shared overhead projector or laptop computer, the physical copies of a book or magazine, etc. just by keeping meta-data on it.

Document Analysis: A branch of Voodoo which has the development of DTDs as its primary objective.

Document Management: A systematic method for storing, locating, and keeping track of information that is valuable to a business. The key characteristics of a document management system is the ability to manage information, to collaborate when creating information, to distribute the information, and to allow secure access to the greatest number of people.

Document Type Definition (DTD): A formal statement of the encoding requirements for a particular class or type of SGML documents.

DOM: The Document Object Model which describes the structure and hierarchy of objects in a web page such as forms, images, links, etc. so they can be manipulated by the browser through scripting.

Down translation: The translation of documents from structural rich and generalized SGML format to an application-specific format such as HTML or PDF. Down translation is usually quite easy, as the name implies, because you going to merely "releasing the potential energy" packed into the SGML representation.

DPI: DPI or Dots per Inch is a measure of the detail of an image. "Apparent dpi" refers to the fact that the eye perceives a giclee as having greater detail than it does in physical reality.

DSSSL (pronounced dis-ul, Document Style, Semantic and Specification Language): A companion standard to SGML for the system independent specification of formatting and general transformation of documents.

data sonification: Assignment of sounds to digitized data which may involve filtering to give illusion of localized sound.

DataGlove: A glove wired with sensors and connected to a computer system for gesture recognition and navigation through a virtual environment. Known generically as a "wired glove".

depth cueing: Use of shading, texture, color, interposition, or other visual characteristics to provide a cue for the distance of an object from the observer.

digital prototype: Simulation of an intended design or product to illustrate the characteristics before actual construction. Usually used as an exploratory tool for manufacturing designers/engineers or as a communications tool for persons reviewing proposed designs.

Doppler effect: An apparent increase in the frequency of sound or light as its source approaches an observer or a decrease if it moves away.

Deformable Object Technology (DOT): Virtual objects which bend and deform appropriately when touched. dynamic lighting: Changes in lighting effects as objects or the observer move.

dynamics: The rules that govern all actions and behaviors within the environment.

E

Element: A named container for a logical portion of a document. Examples of logical portions of documents include such things as chapters, sections, tables, lists, paragraphs, citations, and so forth.

Ethernet: is a particular physical network system that combines high-bandwidth fiber optics (from 1.45 to 100 megabytes per second) with special send and receive hardware. Ethernet is used in a variety of network topologies.

effectors: Interfacing devices used in virtual environments for input/output, tactile sensation and tracking. Examples are gloves, headmounted displays, headphones, and trackers.

egocenter: The sense of one's own location in a virtual environment.

environment: In VR terms, this is a computer-generated model that can be experienced by an observer as if it were a place.

exoskeleton: mechanically linked structure for control of and feedback from an application.

eye clearance: The most accurate figure of merit used to describe the HMD positioning relative to the eye.

eye tracking: Measurement of the direction of gaze.

eyeball in the hand: A metaphor for visualized tracking where the tracker is held in the hand and is connected to motion of the projection point of the display.

F

Firewalls: Software and/or hardware based systems that allow for a high-degree of access control and logging of network activity.

Flash: A bandwidth friendly and browser independent vector-graphic animation technology. As long as different browsers are equipped with the necessary plug-ins, Flash animations will look the same. With Flash, users can draw their own animations or import other vector-based images. Flash animation can only be created using the Flash animation application from Macromedia Inc. Flash was known as FutureSplash until 1997, when Macromedia Inc. bought the company that developed it.

Forward kinematics: Moving objects higher on the hierarchy will affect those on the end; changing joint angles to move a point in 3d space (if you change the angle of your elbow, the position of your hand changes).

field of view (FOV): The angle in degrees of the visual field. Since a human's two eyes have overlapping 140 degree FOV, binocular or total FOV is roughly 180 degrees in most people. A feeling of immersion arises with FOV greater than roughly 60 to 90 degrees.

force feedback: Output that transmits pressure, force or vibration to provide the VR participant with the sense of resisting force, typically to weight or inertia. This is in contrast to tactile feedback, which simulates sensation (e.g., texture) applied to the skin.

fractal: A self-similar graphical pattern generated by using the same rules at various levels of detail. That is, a graphical pattern that repeats itself on a

smaller and smaller scale.

frustum of vision: Three-dimensional field of view in which all modeled objects are visible.

G

Giclee (Fr. "a spraying of ink"): A common term for fine art digital prints, especially those done on Iris printers.

Layouts: Documents describing the precise layout of a print or prints on a sheet of media (e.g., paper, etc.). The layout indicates both the exact size of the prints and the amount of white space around each print.

FTP: File Transfer Protocol--allows users to send and receive certain files from one computer to another on the Internet. See also TCP/IP.

GIF: Stands for Graphic Interchange Format. It was originally created by the CompuServe Online Service.

gesture: Hand motion that can be interpreted as a sign, signal, or symbol.

H

Hierarchical Retrieval: Retrieval of an element and its children from an SGML document. SGML retrieval systems are typically able to deliver elements from any level of an element hierarchy.

Hierarchy: The set of relationships between elements in an SGML document. SGML elements may be deeply nested; that is, children may be parents themselves ad infinitum (subject to a user-specified limits).

Home Page: This phrase is often used to refer to the main document or top page in a collection of organized information.

Hostname: The hostname of a computer is an alpha-numeric representation of a computer's IP address which can be converted by the DNS protocol.

HTML "tag salad": Another sneer from those intractable SGML folks at the HTML world, HTML which is certainly not SGML in that it does not conform to the DTD and which is generally contrary to all rhyme and reason but happens to display O.K. in one particularly promiscuous Web browser or another.

HTML: Hypertext Markup Language is the document coding language of the web. Its forte is its ability to hyperlink using (most frequently) HTTP, though you can embed other protocols within its code. It's bandwidth friendly, especially when authored wisely. Its formatting capability is evolving rapidly. HTML is an SGML language.

HTTP: Hypertext Transport Protocol. The protocol of the WWW.

Hypertext Transport Protocol Daemon (httpd): This is a type of information server that uses HTTP.

HyTime: ISO standard 10744, a companion standard to SGML for hypermedia and time-based applications.

haptic interfaces: Use of physical sensors to provide users with a sense of touch at the skin level, and force feedback information from muscles and joints.

head tracking: Monitoring the position and orientation of the head through various tracking devices.

head-coupled: Displays or robotic actions that are activated by head motion through a head tracking device.

head-related transfer function: A mathematical transformation of sound spectrum that modifies the amplitude and phase of acoustic signals to take into account the shape effects of the listener's head.

heads-up display: A display device that allows users see graphics superimposed on their view of the real world.

hidden surface: A surface of a graphics object that is occluded from view by intervening objects.

head mounted display (HMD): A set of goggles or a helmet with tiny monitors in front of each eye to generate images seen by the wearer as three-dimensional. Often the HMD is combined with a head tracker so that the images displayed in the HMD changes as the head moves.

I

Image maps: Image maps are visual navigation items usually a single image with different "hot spots" that go to corresponding URLs.

Information Node: A discrete piece of information, possibly connected to other discrete pieces of information. The Web is a simple, albeit large, information network where nodes have no identifying characteristics and coarse granularity (pages). SGML introduces the possibility of self-describing nodes and hierarchically organized granularity.

Instance: Encoded text which conforms to a particular DTD and Declaration.

Interface standard: Means for interacting with a computer system or program. From a programming standpoint an interface (generally referred to as an Advanced Programmers Interface, or API) a standard code base for developing on top of an existing application. From an end-point perspective, the inputs, menus, and dialog systems define the user interface.

International Organization for Standardization (ISO): An international organization headquartered in Geneva, Switzerland concerned with the development of standards. Participation in ISO is through national standards organizations such as ANSI (American National Standards Institute). ISO standards are adopted by a vote of member national standards body and are reviewed and updated through on-going processes specified by the ISO by-laws.

Inverse kinematics: When you move an object at the bottom of a hierarchy, everything above it moves as well (when you lift your finger into the air, your hand and arm follow); multiple different joints angles can yield the same result.

IP Internet Protocol: The Internet Protocol is a standard convention for computers attached to the Internet. It is a best effort delivery system that takes data and tries to get it from one computer to another over a network. No promises are given that the data will arrive error-free or even arrive to the destination computer. Also see TCP/IP.

IP Packet: An IP packet is the collection of the necessary information needed to move a chunk of data from one computer to another using the IP protocol. This information includes the data itself, the source computer's IP address and the destination computer's IP address.

immersion: The observer's behavioral (subjective) reaction to the virtual world as being part of it, or virtual model as being actual.

interaural amplitude: Differences between a person's two ears in the intensity of a sound, typically due to the location of the sound.

interaural time: Differences between a person's two ears in the phase of a sound, typically due to the location of the sound.

interface: Any device, software, or technique that allows people to perform tasks with a computer.

inverse kinematics: A specification of the motion of dynamic systems from properties of their joints and extensions.

J

Java: A portable, interpreted, object-oriented computer programming language, similar in syntax to C++, but adding automated memory management and omitting pointer functions.

Java Beans: JavaBeans components, or Beans, are reusable software components that can be employed in distributed applications and manipulated visually in a builder tool. Beans can be combined to create traditional applications, or their smaller web-oriented brethren, applets. In addition, applets can be designed to work as reusable Beans.

Jpeg: Jpeg derives its name from the Joint Photographic Experts Group who created the standard. Jpeg, jpg, or jfif handles 24-bit (or 16.7 million colors) color and it is one of the smallest image file sizes (on disk).

K

kinesthesia: Sensations derived from muscles, tendons and joints and stimulated by movement and tension.

kinesthetic dissonance: Mismatch between feedback or its absence from touch or motion during VR experiences.

L

Legacy Documents: An existing body of documents which must be converted into SGML. SGML project often begin with Document Analysis, the study of legacy documents to determine the logical components of the documents and their equivalent SGML representation. A major pitfall in this process is to base the DTDs exclusively on the legacy documents since these documents usually strongly reflect the limitations of the tools used to create and the enlightened mindset which comes from experience with SGML.

Libraries: Established code elements that can be linked in to programs to perform specific tasks as needed.

latency: Lag between user motion and tracker system response, sometimes measured in frames. Delay between actual change in position and reflection by the program. Delayed response time.

Liquid Crystal Display (LCD): Display devices that use bipolar films sandwiched between thin panes of glass. They are lightweight and transmissive or reflective, and are often used in HMDs.

level of detail (LOD): A model of a particular resolution among a series of models of the same object. Greater graphic performance can be obtained by using a lower LOD when the object occupies fewer pixels on the screen or is not in a region of significant interest.

M

Mailbox: A temporary storage place for e-mail until the user gets around to reading it. At that time the user will either delete it, leave it in the incoming mailbox, or move it to a storage mailbox.

Mainframe: Large monolithic computers that dominated the computing industry in the recent past. These systems were access via dumb terminals and were often warehouses of an organizations computing power.

Meta-data: Data that describes data. Meta-data describes the data in a document but it is not a part of the text of the document. For instance, what is written on the tab of a manila file folder or on the tab of a hanging folder is meta-data. Another example of meta-data is the Summary Info or Properties dialog boxes in Microsoft Office applications that let users add meta-data about the documents, presentations, or spreadsheets.

Mirrored site: Separate server, including both hardware and software, located in a different location than the "primary" server.

Model: An abstracted description of a system. Modeling is used in many design and engineering functions as a means for demystifying complex systems. An information model looks at the form and flow of focused and specific data sets.

MPEG 4: A patented binary data format and compression scheme that can be used to stream geometry, animations, and other multimedia.

Multicast Protocol: A protocol that drastically reduces the amount of needed bandwidth for certain specific types of applications. Such as live audio and/or video broadcasts.

Multi-Texturing: The technique in 3D graphics that provides an explicit description of how multiple texture graphic files are transformed, combined and applied to geometry. This adds a great amount of realism to 3D scenes. These

various textures fall under the headings of: light & shadow maps, diffuse texture maps, specular texture maps, and environment maps. In the case of X3D, this means a profile extension of additional nodes for hardware accelerated lighting and rendering.

metaball: A surface defined about a point specified by a location, a radius, and an "intensity." When two metaballs come in contact, their shapes blend together.

metallic distortion: Noise interference or degraded performance in electromagnetic trackers when used near large metallic objects.

model: A computer-generated simulation of something real.

motion parallax: A means whereby the eyes can judge distance by noticing how closer objects appear to move more than distant ones when the observer moves.

motion platform: A controlled physical system that provides real motion to simulate the displayed motion in a VR world.

N

navigation: Purposeful motion through virtual space.

NIST: National Institute for Standards Technology

NURBS: Non-Uniform Rational B-Splines are a mathematical way to describe 3D geometry based on curves rather than polygons.

O

Object-Oriented programming: Different things in different languages. Generally, objects are small reusable pieces of code that can be used interchangeably in a variety of ways (a concept known as polymorphism), and can take on properties of upper-level code elements (inheritance).

OLE: Object Linking and Embedding, a means for exchanging data (e.g., charts, spreadsheets, and documents) between Microsoft applications.

One-to-many hyperlink: A hyperlink which has more than one destination.

Online meetings: Meetings traditionally involve several people taking time to get together to discuss and resolve issues. Online meetings merely offer an alternative virtual space in which to conduct a meeting. These meetings can be facilitated in many ways including; electronic mail, discussion forums, even video teleconferencing. Depending on the media, these meetings can be facilitated in a manner where all members are participating at the same time, or where each party participates at his or her convenience.

Open Database Connectivity (ODBC): Standard is a means for exchanging data between various database systems regardless of their internal mechanisms. The Java Database Connectivity (JDBC) would-be-standard has been created to allow Java applications to interact with a variety of data sources.

objects: Discrete 3-D shapes within the virtual world with which an operator can interact.

occipital cortex: The back of the brain receiving retinotopic projections of visual displays.

occlusion: Hiding an object or a portion of an object from sight by interposition of other objects.

P

Packets: These are small blocks of information that contain requests for network services, computer addresses and data.

Parent-Child: A relationship between elements such that the element known as the child is contained by the parent.

Parse: This in programmatic terms is to divide and compartmentalize data.

Peer-to-peer: A relationship between elements such that the elements are contained by the same parent.

Perl: Practical Extraction and Reporting Language. Perl is an interpreted language. Interpreted languages always exist in source form. They rely on an interpreter that handles the source at run-time. Personal Address Book: An individual user's address book housed within the e-mail system where she may set up individual entries or distribution lists to facilitate mailing information quickly and efficiently. It is essentially an on-line "Rolodex," with additional options.

Photo CD: A Kodak process for scanning transparencies and storing them on CD in a format known as Photo CD.

Piezo / Micropiezo: A printer head technology that uses micro-electric firing of crystals to control the flow of ink to the substrate.

PNG: This stands for Portable Network Graphic. It is a new format, currently supported by plug-ins in the Netscape and Microsoft Internet Explorer browsers. PNG combines the quality and size of jpegs with the viewing speed of gifs producing quality results.

Ports: These are defined locations in memory that dictate the path of information transfer between a CPU and its peripherals.

Port number: A number that helps a computer looking for another computer on the Internet refine the search to the right service after it finds the right computer using the IP address.

Pretty Good Privacy (PGP): A program that is a publicly available program developed by Phil Zimmerman which encrypts data via an electronic key. This freeware is so good the government attempted ban its use.

Proof: A smaller print - often 8 x 10 inches - used to evaluate a file prior to final printing.

Protocol: Protocols are sets of rules (communications convention or standard) that enable everyone to understand how something is supposed to work. They exist everywhere in our world and are the basics of our standards.

Public DTD: Strictly, a DTD which may be referenced using SGML's formal syntax for the standard DTDs. Less strictly, any of the DTDs which have been placed in the public domain.

pan: The angular displacement of a view along any axis or direction in a three-dimensional world.

parallax: The difference in viewing angle created by having two eyes looking at the same scene from slightly different positions, thereby creating a sense of depth.

parietal cortex: An area of the brain adjacent and above the occipital cortex, thought to process spatial location and direction information.

perspective: The rules that determine the relative size of objects on a flat viewing surface to give the perception of depth.

pitch: The angular displacement of the lateral axis about a horizontal axis perpendicular to the lateral axis.

portal: Polygons or icon that a user can pass through in a virtual space to automatically load a new world or execute a user-defined function.

position sensor: A tracking device that provides information about its location and/or orientation.

position trigger: A hotspot, sensitive spot, or button that causes a change in the application when touched in some way.

presence: A feeling of being immersed in an environment, able to interact with objects there. A defining characteristic of a VR system.



Query: Specific request for information from a data source.

R

radiosity: A diffuse illumination calculation system for graphics based on energy balancing that takes into account multiple reflections off many walls.

ray tracing: A technique for displaying a three-dimensional object with shading and shadows by tracing light rays backward from the viewing position to the light source.

real time: Action taking place with no perceptible or significant delay after the input that initiates the action.

real-time imaging: Graphics or images synchronized with real-world time and events.

refresh rate: The frequency with which an image is regenerated on a display surface.

roll: Angular displacement about the lateral axis.

Radiosity: Radiosity is a method of rendering based on an detailed analysis of light reflections off diffuse surfaces. The images that result from a radiosity renderer are characterized by soft gradual shadows. Radiosity is typically used to render images of the interior of buildings, and can achieve extremely photo-realistic results for scenes that are comprised of diffuse reflecting surfaces.

Raytracing: A technique used in computer graphics to create realistic images by calculating the paths taken by rays of light entering the observer's eye at different angles. The paths are traced backwards from the viewpoint, through a point (a pixel) in the image plane until they hit some object in the scene or go off to infinity. Objects are modelled as collections of abutting surfaces which may be rectangles, triangles or more complicated shapes such as 3D splines. The optical properties of different surfaces (color, reflectance, transmittance, refraction, texture) also affect how it will contribute to the colour and brightness of the ray. The position, colour and brightness of light sources, including ambient lighting, is also taken into account. Ray tracing is an ideal application for parallel processing since there are many pixels, each of whose values is independent and can thus be calculated in parallel.

Regular Expression: A formal expression which describes a set of possible combinations or patterns.

Relational Database Management Systems (RDBMS): Databases that link internal tables via associated fields. Object-Relational DBMS take this to concept one step further allowing for inherited elements and more flexible data relations.

Rendering: The display of the document on the page, requiring the translation of the source data to a screen image. Basic HTML or SGML may be rendered very quickly but complex data such as images or tables presents a more challenging problem. Typographical complexity also slows rendering, and aside from issues of screen resolution is among the reasons why a "paper" look may not be desirable for on-line documents.

Retrieval: The "fetching" of a document or portion of a document from the place where it is stored for delivery to an application.

Revision Control: Maintains multiple versions (revisions) of a document making it possible to recover older versions. Each time a document is checked-in a new version is created, made current, and the older version is archived. An SGML system would maintain version information at the component level.

RIP: Raster Image Processing is software that translates computer imaging into a format useable by digital printers.

RFP: Request for Proposal. Companies often write up desired specifications and requirements for a particular service or product then submit it to vendors. Vendors who wish to compete for the contract or write up a proposal detailing how they can meet those specifications and requirements.

Router: A device that is connected to two or more independent networks and chooses which one to forward the IP packet on to based upon the destination IP address, network bandwidth and load balancing algorithms.

S

SAI: Script Authoring Interface which is the new script API for X3D which is designed to unify scripting languages for 3D and DOM compatibility.

Scalability: A term referring to a client-server system's ability to meet increased traffic. In performance terms, a system that scales linearly doesn't incur an increase in system overhead as traffic increases; in management terms, the cost per user remains constant as the number of users increase. **Secure Hypertext Transfer Protocol (S-HTTP):** This encrypts the transmission of WWW information in the application layer of the network hierarchy.

Secure Socket Layer (SSL): This is a system of WWW information encryption that occurs between the application and transmission layer in the network hierarchy.

Self-describing: A property of a document such that the rules necessary for the interpretation of its content are part of the document. The term "intelligent documents" is synonymous.

Server: A system that responds to clients request with information.

SGML Application: A computer program which understands SGML syntax and does something with SGML documents.

SGML Browser: A computer program which displays an SGML document. An HTML browser is a kind of SGML browser which only displays one kind of SGML, HTML, but when we say SGML browser a program which can display a document based on any DTD is meant. A consequence of this added capability is that a stylesheet mapping SGML elements to display formatting is required. (The formatting of HTML elements is "hard-wired" into HTML-only browsers. HTML is, in a sense, returning to its SGML roots with the introduction of an HTML stylesheet standard, CSS (Cascading Style Sheets) by the W3C. CSS is currently supported by Microsoft's Internet Explorer, with other vendors rapidly following suit.)

SGML Declaration: A formal statement of the basic parameters of an SGML documents such as its character set, the character sequences used to distinguish markup from the document content, and its utilization of optional SGML features.

SGML Editor: A computer program which allows a writer to create SGML instances, that is, the SGML equivalent to a word processor.

SGML: Standard Generalized Markup Language is an international standard for defining markup languages used for document encoding. SGML is typically used to create markup languages which describe the content of document objects. For example, within a document you can identify all places where the content is, say, a warning or perhaps programming code. This information could be used to apply a certain formatting style to the document object or it could equally be used as a search criteria or as a basis for extracting information into a database. In Intranets it is common to see a very general purpose SGML language used as the information repository source format. The general purpose SGML language may be readily translated to HTML for output to an HTML browser, transformed for other applications, or used as is by SGML-capable software.

SGML Transformation: Changing SGML into something else. Unless direct delivery of SGML is part of your architecture you will certainly have to do some of this. SGML is designed to be transformed so this hard as things go, but it doesn't happen magically and as easily as thought as some people seem to assume. The something else in the Intranet world these days is usually HTML although there are many other possibilities either for print, CD-ROM, on-line, and database applications. Even if you think you don't want to transform SGML you will want to since "doing something interesting" with SGML is practically synonymous with "transformation".

SMIL: Synchronized Multimedia Integration Language which can specify the time-sequencing of audio and video elements in a multimedia presentation as well as place them on the display and link them to other media objects. Real Networks utilizes this technology.

Source and Destination: On the Web, the source is the place where you started and the destination is the place you jumped to after clicking on the link.

Staging areas: Places where users can put files for review and editing prior to them being made available to a larger audience.

String: Particular kind of data definition that specifies that information being presented should be taken as is. While $2 + 2$ would be represented as 4 when

treated as a numerical data type, "2 + 2" in string form would be represented as "22."

Structured Query Language (SQL, or "sequel"): Standard data dialect used in most RDBMS and ORDBMS systems. The language basically allows developers to create/add/modify/delete data from a certain source or sources under certain conditions in a certain order.

Styles: Styles are a saved set of formatting characteristics for a paragraph or characters that have a name. Styles not only help with conversion but they make the author's job easier. For example, making a title big, bold, and blue will take only one step when applying the style as opposed to three steps without the style.

Stylesheets: This is a collection of styles, often serving an analogous function to an SGML DTD in that the stylesheet may define the set of legal objects in a particular document type. In SGML applications stylesheets define a set of actions to be performed when processing a document. For example, a stylesheet for display of an SGML document might define a set of formatting parameters which should be associated with a given element.

SVG: Scalable Vector Graphics in a proposed XML application to describe and manipulate 2D shapes, images, and text on a web page.

Syntax: The rules for putting together the parts of a language. Every language, whether natural (like English or Arabic) or constructed (like SGML or C++).

scene view: Virtual display viewed on a large screen or through a terminal window rather than with immersive devices.

shutter glasses: Glasses that alternately block out the left and right eye views in synchrony with the computer display of left- and right-eye images to provide stereoscopic effect.

simulator sickness: Various disturbances, ranging in degree from a feeling of unpleasantness, disorientation, and headaches to extreme nausea, caused by various aspects of a simulator. Possible factors include sensory distortions such as abnormal movement of arms and heads because of the weight of equipment; long delays or lags in feedback, and missing visual cues from convergence and accommodation.

six degrees of freedom (6DOF): Ability to move in three spatial directions and orient about three axes passing through the center of the body. Thus the location and orientation are specified by six coordinates.

spatial navigation: Self orientation and locomotion in virtual worlds.

stereopsis: Binocular vision of images with different views by the two eyes to distinguish depth.

T

TCP: Transmission Control Protocol. A protocol that allows computers to have error-free bi-directional communication together over a network. Utilizes IP for routing and delivery with sequencing, error detection, recovery, demultiplexing of services, and guaranteed delivery added to allow the error-free communication.

TCP/IP: This is the combined protocol standard which generally determines how computers send and receive data over the Internet.

Telnet: This is a network service that allows users to connect to a shell or command-line interface on a host machine.

Transparent GIFs: These are GIFs who have a single color (Red-Green-Blue value) invisible. They allow images to appear in shapes other than square on your web page.

Trojan horses: These are insidious programs designed to give outside users access to data, individual computers and, by extension, whole systems.

tactile displays: Devices that provide tactile and kinesthetic sensations.

telemanipulation: Robotic control of distant objects.

telepresence: Virtual reality experienced from remote locations. Remote control with adequate sensory data to give the illusion of being at that remote location.

terrain: Geographical information and models that can be either randomly generated or based on actual data.

texture mapping: A bitmap pattern added to an object to increase realism.

tracker: A device that provides numeric coordinates to identify the current position and/or orientation of an object or user in real space.

U

UDP: User Datagram Protocol. A protocol that allows computers to have error-detection and unidirectional communication over a network. Utilizes IP for routing and delivery with sequencing, error detection, recovery and demultiplexing of services.

URL: Universal Resource Locator. It's that sometimes very long string of characters at the top of your browser that starts with HTTP:// and often includes "WWW". If you put an address there then press Enter, it "tells" the browser what page to open in the World Wide Web or once your browser opens the address you entered, the URL indicates what page is already open.

universe: The collection of all entities and the space they are embedded in for a VR world.

UNIX-to-UNIX copy (UUCP): This is a file, directory, and disk copy mechanism particular to the UNIX Operating System.

V

Validation: The determination that an instance conforms to the DTD. SGML editors can validate documents as they are being created.

Viruses: Computer programs designed to destroy data on a computer, so named as they tend to replicate in the host system.

viewpoints: Points from which raytracing and geometry creation occurs. The geometric eye point of the simulation.

virtual environments: Realistic, interactive, immersive simulations of places and scenes.

virtual human: Robotic humanoid or photo-realistic, animated character; may be embedded with neural networks/AI-based autonomous behavior for training simulation or telepresence tasks, or may be a properly proportioned representation of a human figure for purposes of human factors/ergonomics analysis.

virtual surgery: Use of computer models and specialized interaction devices that mimic surgical tools to allow medical personnel to practice surgical procedures.

virtual world: Whole virtual environment or universe within a given simulation.

voxel: A cubic volume pixel for quantizing three-dimensional space.

W

Web glut: Sites full of hype, nonsense, trivia, and/or gaudy/poorly executed web applications usually due to poor design.

Workflow: Traditionally, "workflow" is associated with highly sophisticated, rule based computer software engines that, following analysis of a business process, model the process electronically. This involves routing information via an electronic messaging backbone, typically an e-mail system, and setting up decision points so that the information "knows" what to do next. Entire processes can be modeled in this manner and when integrated with electronic signature capability, can completely replace standard paper based processes. This clearly is the goal for many organizations and processes. Companies and individuals, however, can achieve significant return on investment via simple electronic mail based workflow that merely routes documents electronically based on decisions made by users. That simply is the essence of workflow, using computer networking technology to route work processes in a manner that models the

path taken to carry the process from start to finish.

World Wide Web Consortium (W3C): An industry consortium, hosted by MIT, which has taken over most of the development and promotion of standards for the World Wide Web.

WWW: World Wide Web

WYSIWYG: What you see is what you get. The monitor view of documents/files on most word processing and desktop publishing software and now some web page creation tools that give you a very good idea of how the printed page will look while you are viewing it on the screen.

world in the hand: A metaphor for visualized tracking where a tracker is held in the hand and is connected to the motion of an object in a display.

X, Y & Z ...and other Stuff

XHTML: The W3C's effort to refine HTML into strict XML. This tightening of the standard gives developers many more options to deliver valid, multi-tiered content.

XSL: Extensible Style Language actually consists of 2 XML applications: document transformation and document formatting which allows authors to convert content between different documents and then render them to the reader.

yaw: The angular displacement about the vertical axis.

2.21:1 Aspect Ratio: - see "Cinemascope"

3:2 Pulldown: The conversion of film frame rate material (24 fps) to NTSC video (29.97 fps) which results in the addition of approximately 6 frames per second. Pulldown frames are created by blending frames from the original source in a specific pattern, and is very undesirable in compressed movies. Pulldown is introduced with a system called a "Telecine", and may be removed with Media Cleaner's "Intelecine" feature.

4:1:1 Color: Moderately compressed video color subsampling in which the luminance channel is not subsampled, but the chrominance channel has one quarter the resolution. Most of the DV formats, including miniDV, use 4:1:1 color.

4:2:0 Color: Moderately compressed video color subsampling that is very similar to 4:1:1. Standard color for MPEG.

4:2:2 Color: Mildly compressed video color subsampling in which the luminance channel is not subsampled, but the chrominance channel has half the resolution. Commonly used in professional video formats, such as BetaCamSP.

4:3 Aspect Ratio: This is the common display aspect ratio. 320x240 is a 4:3 aspect frame size.

4:4:4 Color: Uncompressed video color which has no subsampling.

8-Bit: This is the color depth which allows 256 colors to be displayed simultaneously. The colors that will be displayed at a given time are specified in the "Palette". Many older computers only have 8-bit displays. Also called "256 Colors" on the MacOS.

16:9 Aspect Ratio: This is the standard display aspect ratio of DVD-Video. When displayed on a normal television (which is 4:3), 16:9 material will be "letterboxed" with black bars at the top and bottom of the screen.

16-Bit: This is the color depth which allows thousands of colors to be displayed simultaneously. Also called "Thousands of Colors" on MacOS, and "high color" on Windows.

24-Bit: This is the color depth which allows millions of colors to be displayed simultaneously; 24-bit images can be truly photographic in quality. Also called "true color" on Windows, and "Millions of Colors" on MacOS.

Fun Words that Should be in any Dictionary

486 - The average IQ needed to understand a PC.

State-of-the-art - Any computer you can't afford.

Obsolete - Any computer you own.

Microsecond - The time it takes for your state-of-the-art computer to become obsolete.

G3 - Apple's new Macs that make you say "Gee, three times faster than the computer I bought for the same price a Microsecond ago."

Syntax Error - Walking into a computer store and saying "Hi, I want to buy a computer and money is no object."

Hard Drive - The sales technique employed by computer salesmen, especially after a Syntax Error.

GUI - What your computer becomes after spilling your coffee on it.

Keyboard - The standard way to generate computer errors.

Mouse - An advanced input device to make computer errors easier to generate.

Floppy - The state of your wallet after purchasing a computer. Portable Computer - A device invented to force businessmen to work at home, on vacation, and on business trips.

Disk Crash - A typical computer response to any critical deadline.

Power User - Anyone who can format a disk from DOS.

System Update - A quick method of trashing ALL of your software.

Accordianated (ah kor' de on ay tid) adj. Being able to drive and refold a map at the same time.

BTW: By The Way. A very common Intranet, e-mail acronym.

Disconfect (dis kon fekt') v. To sterilize the piece of candy you dropped on the floor by blowing on it, somehow assuming this will remove all the germs.

Elecelleration (el a cel er ay' shun) n. The mistaken notion that the more you press an elevator button, the faster the elevator will arrive.

Phonesia (fo nee' zhun) n. The affliction of dialing a phone number and forgetting who you are calling just as someone answers.

Abdicate (v) To give up all hope of ever having a flat stomach

Carcinoma (n) A valley in California, notable for its heavy smog

Esplanade (v) To attempt at explanation while drunk

Willy-nilly (adj) Impotent

Flabbergasted (adj) Appalled over how much weight you have gained

Negligent (adj) Describes a condition in which you absentmindedly answer the door in your nightie

Lymph (v) To walk with a lisp

Gargoyle (n) An olive flavored mouthwash

Coffee (n) A person who is coughed upon

Flatulence (n) The emergency vehicle that picks you up after you are run over by a steamroller

Balderdash (n) A rapidly receding hairline

Testicle (n) A humorous question on an exam

Semantics (n) Pranks conducted by young men studying for the priesthood, including such things as gluing the pages of the priests's prayer book together just before vespers

Oyster (n) A person who sprinkles his conversation with Yiddish expressions

Frisbeetarianism (n) The belief that when you die, your soul goes up on the roof and gets stuck there

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