The Integrated Energy and Communication Systems Architecture

Volume I:
User Guidelines and Recommendations

Appendix A:
Glossary

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Glossary of Terms

0-9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Sources of Definitions

Where possible, formal standard definitions were used for the glossary terms. However, some very useful and/or commonly used terms do not have standard definitions: in these cases, the definitions are based on Web-based glossaries, commercial vendor sites, and, in some cases, expert opinion (labeled "Common Usage").

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American National Standard Telecom Glossary 2000

DOE Glossary of Electric Power Industry Terms

Federal Standard 1037C - Telecommunications: Glossary of Telecommunication Terms

IEC Terms of Reference (*pdf*)

IEC61850-2 (*pdf*)

IEEE P1547 Standard for Interconnecting Distributed Resources with Electric Power Systems

ITU-T X.900 series and ISO/IEC 10746 series, 1995

NERC "*Terms and Their Definitions As Used in the NERC Planning Standards*" (*pdf*)

OMG UML v1.4, v1.5 Terms (*pdf*)

W3C Web Services Glossary ("Copyright © 2004 W3C® (MIT, ERCIM, Keio), World Wide Web Consortium, (Massachusetts Institute of Technology, European Research Consortium for Informatics and Mathematics, Keio University). All Rights Reserved. http://www.w3.org/Consortium/Legal/2002/copyright-documents-20021231")

Webopedia: Online Computer Dictionary for Internet Terms and Technical Support

WhatIs.com

0-9

1000BASE-CX: A version of the IEEE 802.3 standard for Gigabit Ethernet using shielded twisted pair cable (STP). The maximum length of a single segment is 25 meters. [IEEE 802.3]

1000BASE-LX: A version of the IEEE 802.3 standard for Gigabit Ethernet using optical fiber (multi- or single-mode) and long-wave laser. The maximum lengths of a single segment are 550 meters (multimode) and 5000 m (single mode). [IEEE 802.3]

1000BASE-SX: A baseband signaling version of the IEEE 802.3 standard for Gigabit Ethernet using multimode optical fiber and short-wave laser. The maximum length of a single segment is 550 meters. [IEEE 802.3]

1000BASE-T:A baseband signaling version of the IEEE 802.3 standard for Gigabit Ethernet using un-shielded twisted pair cable (UTP). The maximum length of a single segment is 25 meters. [IEEE 802.3]

100BASE-FX: A baseband signaling version of the IEEE 802.3 standard for Fast Ethernet using 2 optical fibers. [IEEE 802.3]

100BASE-T: An implementation of the Ethernet IEEE 802.3 standard on unshielded, twisted-pair wiring (UTP), using baseband signaling, at 100 Mbps. The maximum length of a single segment is 100 meters. [IEEE 802.3]

100BASE-T4: A baseband signaling version of the IEEE 802.3 standard for Fast Ethernet using four UTP pairs. [IEEE 802.3]

100BASE-TX: A baseband signaling version of the IEEE 802.3 standard for Fast Ethernet using 2 UTP or STP pairs. [IEEE 802.3]

100VG-AnyLAN: A proposed 100-Mbps LAN topology over UTP as suggested by Hewlett Packard.

10BASE2: An implementation of the Ethernet IEEE 802.3 standard on thin RG58 coaxial cable, a baseband medium, at 10 Mbps. It is a bus topology LAN that uses baseband signaling with a maximum segment length of 185 meters. Also known as Thin Ethernet or Thinnet. [IEEE 802.3]

10BASE5: The original Ethernet IEEE 802.3 standard as defined by DEC(tm), Xerox(R), and Intel(R), which uses thick coaxial cable. It is a bus topology LAN that uses baseband signaling with a maximum segment length of 500 meters. Also known as Thick Ethernet or Thicknet. [IEEE 802.3]

10BASE-F: The 10BaseF standard developed by the IEEE 802.3 committee defines the use of fiber for Ethernet. **10BaseFB** allows up to 2km per segment (on multi-mode fiber) and is designed for backbone applications such as cascading repeaters. **10BaseFL** describes the standards for the fiber optic links between stations and repeaters, again allowing up to 2 km per segment on multi-mode fiber. In addition, there are the **10BaseFP** (Passive components) standard and the FOIRL (Fiber Optic Inter-Repeater Link), which provides the specification for a fiber optic MAU (Media Attachment Unit) and other interconnecting components. [IEEE 802.3]

10BASE-T: An implementation of the Ethernet IEEE 802.3 standard on unshielded, twisted-pair wiring, a baseband medium, at 10 Mbps. The maximum length of a single segment is 100 meters. [IEEE 802.3]

10BROAD36: An implementation of the Ethernet IEEE 802.3 standard using analog PSK modulation. [IEEE 802.3]

1BASE5: An implementation of the Ethernet IEEE 802.3 standard for low data-rate. Uses twisted-pair cable and daisy-chained connection with a range of 185 meters at 1 Mbps. In AT&T (NCR)'s implementation called StarLAN. [IEEE 802.3]

23B+D: ISDN primary-rate service consisting of 23* 64 Kbps B Channels and one 64 Kbps D Channel. Overhead is 8 kbps which adds up to 1.544 Mbps (same as DS-1/T-1 Line). See also PRI. [ISDN]

2B+D: ISDN basic-rate service consisting of two 64 Kbps B Channels and one 16 Kbps D Channel. Overhead is 48 kbps which adds up to 192 kbps. See also BRI. [ISDN]

3DES: DES run 3 times. [WhatIs.com]

56K leased line: Permanent network connection leased from a telecommunication provider. The leased line uses special high-speed phone lines and sends/receives data at 56 Kbps. [**Common Usage**]

A

ABR (Area Border Router): Routers that belong to multiple areas, called area border routers (ABR), have the duty of disseminating routing information or routing changes between areas. [**Common Usage**]

Abstract Communication Service Interface (ACSI): Virtual interface to an IED providing abstract information modeling methods for Logical-Devices, Logical-Nodes, Data, and Data Attributes, and communication services e.g. connection, variable access, unsolicited data transfer, device control and file transfer services, independent of the actual communication stack and profiles used. [**IEC 61850-2]**

Abstract Syntax: In open systems architecture, the specification of application-layer data or application-protocol control information by using notation rules that are independent of the encoding technique used to represent the information. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Abstract Syntax Notation One (ASN.1): A standard, flexible method that (a) describes data structures for representing, encoding, transmitting, and decoding data, (b) provides a set of formal rules for describing the structure of objects independent of machine-specific encoding techniques, (c) is a formal network-management Transmission Control Protocol / Internet Protocol (TCP/IP) language that uses human-readable notation and a compact, encoded representation of the same information used in communications protocols, and (d) is a precise, formal notation that removes ambiguities. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Abstraction: The process of suppressing irrelevant detail to establish a simplified model, or the result of that process. [ISO/IEC 10746, OMG UML]

ACAP (Application Configuration Access Protocol): ACAP is the Application Configuration Access Protocol, an internet protocol for accessing client program options, configurations, and preference information remotely. ACAP is a solution for the problem of client mobility on the Internet. Almost all Internet applications currently store user preferences, options, server locations, and other personal data in local disk files. These leads to the unpleasant problems of users having to recreate configuration set-ups, subscription lists, addressbooks, bookmark files, folder storage locations, and so forth every time they change physical locations. ACAP was originally derived from the Internet Message Support Protocol (IMSP). IMSP was fully implemented on both the server and client level, but as a result of suggestions coming out of the IETF standards process it has evolved into ACAP. While originally designed to support Internet mail clients in conjunction with IMAP4, ACAP can operate completely independently of IMAP and messaging. [ACAP: Application Configuration Access Protocol]

Access: **1.** The ability and means necessary to store data in, to retrieve data from, to communicate with, or to make use of any resource of a system. **2.** To obtain the use of a resource. **3.** (COMSEC) [The] capability and opportunity to gain detailed knowledge of or to alter information or material. [NIS] **4.** (AIS) [The] ability and means to communicate with (*i.e.*, input to or receive output from), or otherwise make use of any information, resource, or component in an AIS. *Note [for 3 and 4]:* An individual does not have "access" if the proper authority or a physical, technical, or procedural measure prevents him/her from obtaining knowledge or having an opportunity to alter information, material, resources, or components. [NIS] **5.** An assigned portion of system resources for one data stream of user communications or signaling. **6.** [An] opportunity to make use of an information-system (IS) resource. [INFOSEC-99] [T1 Glossary 2000: Glossary of Telecommunications Terms]

Access Control: **1.** A service feature or technique used to permit or deny use of the components of a communication system. **2.** A technique used to define or restrict the rights of individuals or application programs to obtain data from, or place data onto, a storage device. **3.** The definition or restriction of the rights of individuals or application programs to obtain data from, or place data into, a storage device. **4.** Limiting access to information system resources only to authorized users, programs, processes, or other systems. [INFOSEC-99] **5.** That function performed by the resource controller that allocates system resources to satisfy user requests. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Access Control List (ACL): **1.** In security, a list of entities, together with their access rights, that are authorized to access a resource. **2.** [A] mechanism implementing discretionary and/or mandatory access control between subjects and objects. [INFOSEC-99]. See T1 Glossary 2000: Glossary of Telecommunications Terms. An access control list (ACL) is a table that tells a computer operating system which access rights each user has to a particular system object, such as a file directory or individual file. Each object has a security attribute that identifies its access control list. The list has an entry for each system user with access privileges. The most common privileges include the ability to read a file (or all the files in a directory), to write to the file or files, and to execute the file (if it is an executable file, or program). The list is implemented differently by each operating system. [WhatIs.com]

Access Point: Communication access point to an IED. This may be a serial port, an Ethernet connection, or a client or server address dependent on the stack being used. Each access point of an IED to a communication bus is uniquely identified. Each Server has only one, logical, access point. **[IEC 61850-2]**

Access transparency: A distribution transparency that masks differences in data representation and invocation mechanisms to enable inter-working between objects. [ISO/IEC 10746, OMG UML]

ACSE: Association Control Service Element

Action: Something which happens. An action occurrence. The set of actions associated with an object is partitioned into internal actions and interactions. [ISO/IEC 10746, OMG UML]

Active Server Pages (ASP): An Active Server Page (ASP) is an HTML page that includes one or more scripts (small embedded programs) that are processed on a Microsoft Web server before the page is sent to the user. An ASP is somewhat similar to a server-side include or a common gateway interface (CGI) application in that all involve programs that run on the server, usually tailoring a page for the user. Typically, the script in the Web page at the server uses input received as the result of the user's request for the page to access data from a database and then builds or customizes the page on the fly before sending it to the requestor. [WhatIs.com]

Active Star Network: A network wired in a star topology with a concentrator or multi-port repeater located at the center of the star. All wiring runs to the concentrator, which is responsible for retransmitting the network signal form one wiring run to the rest of the wiring runs attached to it. [**Common Usage**]

ActiveX: A loosely defined set of technologies developed by Microsoft. ActiveX is an outgrowth of two other Microsoft technologies called *OLE (Object Linking and Embedding)* and *COM (Component Object Model)*. As a moniker, *ActiveX* can be very confusing because it applies to a whole set of COM-based technologies. Most people, however, think only of ActiveX controls, which represent a specific way of implementing ActiveX technologies. ActiveX (TM) is a technology and set of programming tools from Microsoft for building interactivity with users into Web pages and application programs. Controls are roughly similar to Java applets, Documents are objects that are viewable and navigable with a viewer. [What is ActiveX? - A Word Definition From the Webopedia Computer Dictionary]

Activity: A single-headed directed acyclic graph of actions, where occurrence of each action in the graph is made possible by the occurrence of all immediately preceding actions (i.e. by all adjacent actions which are closer to the head). [ISO/IEC 10746, OMG UML]

Actor: An enterprise object that participates in the action. A term used in the Unified Modeling Language (UML) to designate the role a human, an application, or a system plays in the function being modeled. A coherent set of roles that users of use cases play when interacting with these use cases. An actor has one role for each use case with which it communicates. From OMG's UML v1.5 Glossary

Adaptive Control: Secondary control (of active power): Secondary control whose characteristics are time-variable and result from the optimization of some operational conditions. [IEC 1/1929/CD]

Add/Drop Multiplexing (ADM): A multiplexing function offered in connection with SONET that allows lower level signals to be added or dropped from a high-speed optical carrier channel in a wire center. The connection to the add/ drop multiplexer is via a channel to a central office port at a specific digital speed (*i.e.*, DS3, DS1, *etc.*). [NECA/ FCC-5] [T1 Glossary 2000: Glossary of Telecommunications Terms].

Address: A unique name (or number) identifying a computer user or computer. There are three types of addresses in common use within the Internet. They are; email address; IP, internet or Internet address; and hardware or MAC address. In communications, the coded representation of the source or destination of a message. **2.** In data processing, a character or group of characters that identifies a register, a particular part of storage, or some other data source or destination. **3.** To assign to a device or item of data a label to identify its location. **4.** The part of a selection signal that indicates the destination of a call. **5.** To refer to a device or data item by its address. [T1 Glossary 2000: Glossary of Telecommunications Terms].

Address Book: A place to save and access frequently used e-mail addresses. [**Common Usage**]

Address Resolution: Conversion of an Internet address to the corresponding physical address. On an Ethernet, resolution requires broadcasting on the local area network. See ARP, RARP.

Address Resolution Protocol (ARP): A Transmission Control Protocol / Internet Protocol (TCP/IP) protocol that dynamically binds a Network Layer IP address to a Data Link Layer physical hardware address, *e.g.*, Ethernet address. [T1 Glossary 2000: Glossary of Telecommunications Terms].

ADSL: See Asymmetric Digital Subscriber Line (ADSL).

Advanced Encryption Standard (AES): The Advanced Encryption Standard (AES) is an encryption algorithm for securing sensitive but unclassified material by U.S. Government agencies and, as a likely consequence, may eventually become the de facto encryption standard for commercial transactions in the private sector. (Encryption for the US military and other classified communications is handled by separate, secret algorithms.)

In January of 1997, a process was initiated by the National Institute of Standards and Technology (NIST), a unit of the U.S. Commerce Department, to find a more robust replacement for the Data Encryption Standard (DES) and to a lesser degree Triple DES. The specification called for a symmetric algorithm (same key for encryption and decryption) using block encryption (see block cipher) of 128 bits in size, supporting key sizes of 128, 192 and 256 bits, as a minimum. The algorithm was required to be royalty-free for use worldwide and offer security of a sufficient level to protect data for the next 20 to 30 years. It was to be easy to implement in hardware and software, as well as in restricted environments (for example, in a smart card) and offer good defenses against

various attack techniques. The end result [of the analysis of 5 algorithms] was that on October 2, 2000, NIST announced that Rijndael had been selected as the proposed standard. On December 6, 2001, the Secretary of Commerce officially approved Federal Information Processing Standard (FIPS) 197, which specifies that all sensitive, unclassified documents will use Rijndael as the Advanced Encryption Standard. [WhatIs.com]

AES: See Advanced Encryption Standard

Agent: An enterprise object that has been delegated (authority, responsibility, a function, etc.) by and acts for another enterprise object (in exercising the authority, carrying out the responsibility, performing the function, etc.) [ISO/IEC 10746, OMG UML].

Aggregation: In UML, a special form of association that specifies a whole-part relationship between the aggregate (whole) and a component part. See: composition. [OMG's UML v1.5 Glossary]

Aggregator: Any marketer, broker, public agency, city, county, or special district that combines the loads of multiple end-use customers in facilitating the sale and purchase of electric energy, transmission, and other services on behalf of these customers. [**DOE Glossary of Electricity Terms]**

Alias: Another name for an existing user's identity. In networking, one of a set of domain names of an Internet resource. [2382-pt.35] **3.** *Synonyms* **personal number, UPT number.** [T1 Glossary 2000: Glossary of Telecommunications Terms]

AM (Amplitude Modulation): Modulation in which the amplitude of a carrier wave is varied in accordance with some characteristic of the modulating signal. *Note:* Amplitude modulation implies the modulation of a coherent carrier wave by mixing it in a nonlinear device with the modulating signal to produce discrete upper and lower sidebands, which are the sum and difference frequencies of the carrier and signal. The envelope of the resultant modulated wave is an analog of the modulating signal. The instantaneous value of the resultant modulated wave is the vector sum of the corresponding instantaneous values of the carrier wave, upper sideband, and lower sideband. Recovery of the modulating signal may be by direct detection or by heterodyning. [T1 Glossary 2000: Glossary of Telecommunications Terms]

AM/FM (Automatic Mapping and Facilities Management): system comprising a graphical database of geographical maps of the power system, and a database of asset information. [**Common Usage**]

AMR (Automatic Meter Reading): systems for accessing meter information electronically from the customer sites. AMR systems range from hand-held devices, to drive-by van systems, to fixed network systems, to Internet-based systems. [**Common Usage**]

Analog Data: Data represented by a physical quantity that is considered to be continuously variable and has a magnitude directly proportional to the data or to a suitable function of the data. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Ancillary Services - Ancillary services are those functions performed by the equipment and people that generate, control, and transmit electricity in support of the basic services of generating capacity, energy supply, and power delivery. The Federal Energy Regulatory Commission (FERC) defined such services as those "necessary to support the transmission of electric power from seller to purchaser given the obligations of control areas and transmitting utilities within those control areas to maintain reliable operations of the interconnected transmission system." The most common ancillary services are:

System control	The control-area operator functions that schedule generation and transactions before the fact and that control some generation in real-time to maintain generation/load balance; Working Group definition more restricted, with a focus on reliability, not commercial, activities, including generation/load balance, transmission security, and emergency preparedness
Reactive supply and voltage control from generation	The injection or absorption of reactive power from generators to maintain transmission-system voltages within required ranges
Regulation	The use of generation equipped with governors and automatic-generation control to maintain minute-to-minute generation/load balance within the control area to meet NERC control-performance standards
Operating reserve - spinning	The provision of generating capacity (usually with governors and automatic-generation control) that is synchronized to the grid and is unloaded that can respond immediately to correct for generation/load imbalances caused by generation and transmission outages and that is fully available within 10 minutes
Operating reserve - supplemental	The provision of generating capacity and curtailable load used to correct for generation/load imbalances caused by generation and transmission outages and that is fully available within 10 minutes
Energy imbalance	The use of generation to correct for hourly mismatches between actual and scheduled transactions between suppliers and their customers
Load following	The use of generation to meet the hour-to-hour and daily variations in system load
Backup supply	Generating capacity that can be made fully available within one hour; used to back up operating reserves and for commercial purposes
Real-power-loss replacement	The use of generation to compensate for the transmission-system losses from generators to loads
Dynamic scheduling	Real-time metering, telemetering, and computer software and hardware to electronically transfer some or all of a generator's output or a customer's load from one control area to another

System-black-start capability	The ability of a generating unit to go from a shutdown condition to an operating condition without assistance from the electrical grid and to then energize the grid to help other units start after a blackout occurs
Network-stability services	Maintenance and use of special equipment (e.g., power-system stabilizers and dynamic-braking resistors) to maintain a secure transmission system

[Eric Hirst: Ancillary Services, based on FERC definitions]

Announcement: An interaction -- the invocation -- initiated by a client object resulting in the conveyance of information from that client object to a server object, requesting a function to be performed by that server object. [ISO/IEC 10746, OMG UML]

Anonymous FTP: Anonymous FTP is a method for giving users access to files so that they don't need to identify themselves to the server. Using an FTP program or the FTP command interface, the user enters "anonymous" as a user ID. Usually, the password is defaulted or furnished by the FTP server. Anonymous FTP is a common way to get access to a server in order to view or download files that are publicly available. [WhatIs.com]

ANSI: The American National Standards Institute disseminates basic standards like ASCII, and acts as the United States' delegate to the ISO. http://www.ansi.org

APDU: Application Protocol Data Unit

API (Application Programming Interface): A formalized set of software calls and routines that can be referenced by an application program in order to access supporting network services. [T1 Glossary 2000: Glossary of Telecommunications Terms]

APOP: 1) Authenticated Post Office Protocol is an MD5-based login command that does not send passwords in clear text over the network. See also POP3.

Applet: An applet is a "little application" written in the Java™ programming language that can be included in an HTML Web page, much in the same way an image is included. An applet can be sent along with a Web page to a user. Java applets can perform interactive animations, immediate calculations, or other simple tasks without having to send a user request back to the server. [WhatIs.com]

AppleTalk: AppleTalk is a set of local area network communication protocols originally created for Apple computers. An AppleTalk network can support up to 32 devices and data can be exchanged at a speed of 230.4 kilobits per second (Kbps). Devices can be as much as 1,000 feet apart. AppleTalk's Datagram Delivery Protocol corresponds closely to the Network layer of the Open Systems Interconnection (OSI) communication model. [WhatIs.com]

Application: **1)** In information technology, an application is the use of a technology, system, or product. **2)** The term application is a shorter form of application program. An application program is a program designed to perform a specific function directly for the user or, in some cases, for another application program. Examples of applications include word processors, database programs, Web browsers, development tools, drawing, paint, image editing programs, and communication programs. Applications use the services of the computer's operating system and other supporting applications. The formal requests and means of communicating with other programs that an application program uses is called the application program interface (API). [WhatIs.com]

Application Layer: Layer 7 in the OSI model; This layer interfaces directly to and performs common application services for the application processes; it also issues requests to the Presentation Layer. The common application services provide semantic conversion between associated application processes. *Note:* Examples of common application services of general interest include the virtual file, virtual terminal, and job transfer and manipulation protocols. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Application Level Gateway: A firewall system in which service is provided by processes that maintain complete TCP connection state and sequencing. Application level firewalls often re-address traffic so that outgoing traffic appears to have originated from the firewall, rather than the internal host. [**Common Usage**]

Application management: The management of applications within an ODP system. Some aspects of applications management are common to all applications and are termed application independent management. Those aspects that are specific to a given application are termed application specific management. [ISO/IEC 10746, OMG UML]

Architecture: the structure of components, their relationships, and the principles and guidelines governing their design and evolution over time. [DoD Integrated Architecture Panel, 1995, based on IEEE STD 610.12]

Architecture Description: An architecture description is a representation of a defined domain (or Environment), as of a current or future point in time, in terms of its component parts, what those parts do, how the parts relate to each other, and the rules and constraints under which the parts function. What constitutes each of the elements of this definition depends on the degree of detail of interest. [DoD Integrated Architecture Panel, 1995, based on IEEE STD 610.12]

Archive: 1) An archive is a collection of computer files that have been packaged together for backup, to transport to some other location, for saving away from the computer so that more hard disk storage can be made available, or for some other purpose. An archive can include a simple list of files or files organized under a directory or catalog structure (depending on how a particular program supports archiving). [WhatIs.com]

Archive File: A software file that has been set aside, often in a redundant storage medium, as a security measure or for later retrieval, *e.g.*, for research or verification. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Artifact (with respect to an action): An enterprise object that is referenced in the action [ISO/IEC 10746, OMG UML].

ARP (Address Resolution Protocol): is part of the TCP/IP protocol suite. Is used to obtain the physical address of a node when the Internet address is known. Defined for Ethernet in RFC0826 See also RFC2834, RFC2835, RFC1390, RFC2225, RFC2320, RFC2625.

ARPA (Advanced Research Projects Agency): The government agency that funded ARPAnet and later the DARPA internet. Now known as DARPA (Defense Advanced Research Projects Agency). [**Common Usage]**

ARPAnet: Advanced Research Projects Agency, a U.S. government organization. The granddaddy of the Internet, ARPAnet was an experimental network, established in the 1970s, where pretty much everything on which the Internet is based were created and tested. No longer in existence. [**Common Usage]**

ASCII (American Standard Code for Information Interchange): *Acronym for* **American Standard Code for Information Interchange.** The standard code used for information interchange among data processing systems, data communications systems, and associated equipment in the United States. *Note 1:* The ASCII character set contains 128 coded characters. *Note 2:* Each ASCII character is a 7-bit coded unique character; 8 bits when a parity check bit is included. *Note 3:* The ASCII character set consists of control characters and graphic characters. *Note 4:* When considered simply as a set of 128 unique bit patterns, or 256 with a parity bit, disassociated from the character equivalences in national implementations, the ASCII may be considered as an alphabet used in machine languages. *Note 5:* The ASCII is the U.S. version of International Reference Alphabet (IRA) No. 5 (formerly International Alphabet No. 5, or "IA5") as specified in ITU-T Recommendation T.50. [T1 Glossary 2000: Glossary of Telecommunications Terms]

ASN.1 (Abstract Syntax Notation One): an ISO standard describing a message (a unit of application data) that can be sent or received in a network. ASN.1 is divided into two parts: (1) the rules of syntax for describing the contents of a message in terms of data type and content sequence or structure. Defined in ISO/IEC 8824 and **ITU-T X.208** (2) how you actually encode each data item in a message. Defined in ISO/IEC 8825 and **ITU-T X.209.**

Association: In UML, the semantic relationship between two or more classifiers that specifies connections among their instances. [OMG's UML v1.5 Glossary]

Association Control Service Element (ACSE): The ISO Association Control Service Element (ACSE), an application layer protocol in the OSI model, is to establish and

release an application-association between two AEIs and to determine the application context of that association. The ACSE supports two modes of communication: connection-oriented and connectionless. For the connection-oriented mode, the application-association is established and released by the reference of ACSE connection oriented services. For the connectionless mode, the application-association exists during the invocation of the single ACSE connectionless mode service, A-UNIT-DATA . [**ISO (www.iso.org) documents 8650 and 8649] and [ITU (www.itu.org) documents X.217, X.227, X.237**].

Asymmetric Encryption: An encryption system that utilizes two keys, one called a *public key* (which is known to both the sender and the recipient of encrypted data), and the other, called a *private key* (known only to the individual sending the data). *Note:* Data are encrypted with the private key and decrypted with the public key. Asymmetric encryption allows for the secure transfer of data. [After Bahorsky]**.** [T1 Glossary 2000: Glossary of Telecommunications Terms]

Asynchronous Communication System: A data communications system that uses asynchronous operation. *Note:* The time spacing between successive data characters or blocks may be of arbitrary duration. *Synonym* **start-stop system.** [T1.X1], basically a method for transmitting data with start and stop bits and a variable time between data units. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Asynchronous Transfer Mode (ATM): A high-speed multiplexing and switching method utilizing fixed-length cells of 53 octets to support multiple types of traffic. *Note:* ATM, specified in international standards, is asynchronous in the sense that cells carrying user data need not be periodic. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Asset: 1. In security, a resource or information that is to be protected. [After CC-99] **2.** Any system or component (*e.g.*, subsystem, hardware, firmware, software, database, or interconnection communications network or facility) that is part of a communications system or an information system. [After FAA] [T1 Glossary 2000: Glossary of Telecommunications Terms]

Association: a conveyance path established between a client and a server for the exchange of messages. [**IEC61850-2**]

Asymmetric Digital Subscriber Line (ADSL): 1. An access technology that allows voice and high-speed data to be sent simultaneously over local exchange service copper facilities; the technology supports data rates of up to 1.544 Mb/s when receiving data (downstream rate) and up to 256 kb/s when sending data (upstream rate). **2.** A modem technology that provides enhanced and affordable access to the Internet, live video, and a wide variety of other multimedia broadband services over existing copper twisted-pair wirelines; usually the ADSL operates with different data rates in the two directions. [After NCS TIP 99-1] [T1 Glossary 2000: Glossary of Telecommunications Terms]

ATC (Available Transmission Capacity): ATC is calculated as the Total Transmission Capacity (TTC) less existing transmission schedules. The FERC requires ATC to be offered over the OASIS system by Transmission Providers for Transmission Customers to bid on, in order for them to transport energy over the intervening transmission system from a generation point to a load point. [NERC]

ATM Forum: - A worldwide organization that promotes and sets standards for ATM networks and equipment. [http://www.atmforum.com]

Atomicity: An entity is atomic at a given level of abstraction if it cannot be subdivided at that level of abstraction [ISO/IEC 10746, OMG UML].

Attachment: A file that is sent (attached) with an e-mail message. [**Common Usage]**

Attack: 1. An attempt to violate computer security. *Note:* An example of an attack is malicious logic. [2382-pt.8] **2.** [An] intentional act of attempting to bypass one or more of the following security controls of an information system (IS): nonrepudiation, authentication, integrity, availability, or confidentiality. [INFOSEC-99] [T1 Glossary 2000: Glossary of Telecommunications Terms]

Attribute: **1.** In database management, a property inherent in an entity or associated with that entity for database purposes. **2.** In network management, a property of a managed object that has a value. *Note 1:* Mandatory initial values for attributes can be specified as part of the managed object class definition. *Note 2:* Attributes may be either mandatory or conditional. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Audit:: 1. To conduct an independent review and examination of system records and activities in order to test the adequacy and effectiveness of data security and data integrity procedures, to ensure compliance with established policy and operational procedures, and to recommend any necessary changes. **2.** Independent review and examination of records and activities to assess the adequacy of system controls, to ensure compliance with established policies and operational procedures, and to recommend necessary changes in controls, policies, or procedures. [INFOSEC-99] [T1 Glossary 2000: Glossary of Telecommunications Terms]

AusCERT: Australian Computer Emergency Response Team
Computational Resource The definition of computational resources shall be restricted to communication infrastructure and computer programs. It shall not include information provided by a computer program nor the physical computer itself. The information provided by a computer program shall be considered an Informational resource. The physical computer/network resource itself will be considered a physical resource.Example: An Operating System (OS) of a computer is to be considered a computational resource, but the computer that executes the OS shall be considered a physical asset.

Authentication: **1.** [Any] Security measure designed to establish the validity of a transmission, message, or originator, or a means of verifying an individual's authorization to receive specific categories of information. [INFOSEC-99] [After JP 1-02] **2.** A security measure designed to protect a communications system against acceptance of a fraudulent transmission or simulation by establishing the validity of a transmission, message, or originator. [JP 1-02] **3.** Evidence by proper signature or seal that a document is genuine and official. [JP 1-02] [T1 Glossary 2000: Glossary of Telecommunications Terms]

Authentication Token: A portable device used for authenticating a user. Authentication tokens operate by challenge/response, time-based code sequences, or other techniques. This may include paper-based lists of one-time passwords. [**Common Usage**]

Authentication Tool: Software or hand-held hardware "key" or "token" utilized during the user authentication process. See key and token. [**Common Usage**]

Authorization: **1.** The rights granted to a user to access, read, modify, insert, or delete certain data, or to execute certain programs. **2.** Access privileges granted to a user, program, or process. [INFOSEC-99] [T1 Glossary 2000: Glossary of Telecommunications Terms]. **3.** A prescription that a particular behavior must not be prevented. [ISO/IEC 10746, OMG UML]

Auto-Magic: Something that happens pseudo-automatically, and is usually too complex to go into any further than to say it happens "automagically." [**Common Usage**]

Automatic Generation Control (AGC): The automatic control of generation based on Load Frequency Control for immediate responses and on a dispatch algorithm for long term movement of generation. In the past, Economic Dispatch was used; more frequently in the deregulated environment, Merit Order Dispatch according to market energy schedules. [**Common Usage**]

Automatic Load Frequency Control - Automatic control system found in the connected power systems, taking into account at the same time the criteria that provide for maintenance of the power exchange balance and the frequency according to the specific algorithm. [**Common Usage**]

Automatic Transformer Tap- Changer Control - Automatic transformer ratio control circuit that operates according to a program which is made depend on time and match the changing load or voltage of the transformers. [**Common Usage**]

Automatic Voltage Control System - Voltage control system at the generation node. [**Common Usage**]

Autonomous System Number (ASN): The globally unique number of the AS.

Auxiliary Power - Power consumed by the equipment and installations that are necessary in the energy generation process by generating unit. [**Common Usage**]

Availability: **1.** The degree to which a system, subsystem, or equipment is operable and in a committable state at the start of a mission, when the mission is called for at an unknown, *i.e.*, a random, time. *Note 1:* The conditions determining operability and committability must be specified. *Note 2:* Expressed mathematically, availability is 1 minus the unavailability. **2.** The ratio of (a) the total time a functional unit is capable of being used during a given interval to (b) the length of the interval. *Note 1:* An example of availability is 100/168 if the unit is capable of being used for 100 hours in a week. *Note 2:* Typical availability objectives are specified in decimal fractions, such as 0.9998. **3.** Timely, reliable access to data and information services for authorized users. [INFOSEC-99] [T1 Glossary 2000: Glossary of Telecommunications Terms]

AWG: The American Wire Gauge system, which specifies wire width. [American Wire Gauge table and AWG Electrical Current Load Limits]

B

B Channel: In the Integrated Services Digital Network (ISDN), the B-channel is the channel that carries the main data. (The "B" stands for "bearer" channel.) In ISDN, there are two levels of service: the Basic Rate Interface, intended for the home and small enterprise, and the Primary Rate Interface, for larger users. Both rates include a number of B- (bearer) channels and a D-channel. The B-channels carry data, voice, and other services. The D-channel carries control and signaling information. The Basic Rate Interface consists of two 64 Kbps B-channels and one 16 Kbps D-channel. Thus, a Basic Rate Interface user can have up to 128 Kbps service. The Primary Rate Interface consists of 23 B-channels and one 64 Kpbs D-channel in the United States or 30 B-channels and 1 D-channel in Europe. [WhatIs.com]

Backbone: **1.** The high-traffic-density connectivity portion of any communications network. **2.** In packet-switched networks, a primary forward-direction path traced sequentially through two or more major relay or switching stations. *Note:* In packet-switched networks, a backbone consists primarily of switches and interswitch trunks. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Back Door: A back door is a means of access to a computer program that bypasses security mechanisms. A programmer may sometimes install a back door so that the program can be accessed for troubleshooting or other purposes. However, attackers often use back doors that they detect or install themselves, as part of an exploit. From WhatIs.com. A hidden software or hardware mechanism, usually created for testing and troubleshooting, that may be used to circumvent computer security. [2382-pt.8]. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Balancing Bid - bid presented by the specific balancing market participant to the transmission system operator in reference to the balancing market, presenting the precisely defined trade and technical data. [**Common Usage**]

Balancing Market - A part of the electricity market where Market Participants must submit balanced schedules in advance of the settlement period in which the generation must match load. During the settlement period, the RTO/ISO operator balances the market through the use of ancillary services that have been bid into the market for that purpose. [**Common Usage**]

Balancing Market Delivery Point - This is an agreed point in the network covered by the balancing market operation area, where the settlement of the energy flow between the scheduling units and the network takes place. [**Common Usage**]

Bandwidth: Bandwidth has a general meaning of how much information can be carried in a given time period (usually a second) over a wired or wireless communications link. For example, a link with a broad bandwidth - that is, a broadband link - is one that may be able to carry enough information to sustain the succession of images in a video presentation. More technically, bandwidth is the width of the range of frequencies that an electronic signal occupies on a given transmission medium. Any digital or analog signal has a bandwidth. [WhatIs.com].

Bandwidth: 1. The difference between the limiting frequencies within which performance of a device, in respect to some characteristic, falls within specified limits. **2.** The difference between the limiting frequencies of a continuous frequency band. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Banner Ads: A strip of web site real estate that entices visitors to click and go to a linked web site. [**Common Usage**]

Bar Code: A code representing characters by sets of parallel bars of varying thickness and separation that are read optically by transverse scanning. *Note:* Bar code uses include identifying merchandise, sorting mail, and inventorying supplies. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Baseband: **1.** The original band of frequencies produced by a transducer, such as a microphone, telegraph key, or other signal-initiating device, prior to initial modulation. *Note 1:* In transmission systems, the baseband signal is usually used to modulate a carrier. *Note 2:* Demodulation re-creates the baseband signal. *Note 3: Baseband* describes the signal state prior to modulation, prior to multiplexing, following demultiplexing, and following demodulation. *Note 4:* Baseband frequencies are usually characterized by being much lower in frequency than the frequencies that result when the baseband signal is used to modulate a carrier or subcarrier. **2.** In facsimile, the frequency of a signal equal in bandwidth to that between zero frequency and maximum keying frequency. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Basic Encoding Rules (BER): One set of rules for encoding data defined by ASN.1 into a particular representation (the actual bits and bytes) for transporting data across a communications link. Other sets of rules include the Packed Encoding Rules (PER) and the Light Encoding Rules (LER). [ISO]

Basic engineering object: An engineering object that requires the support of a distributed infrastructure. [ISO/IEC 10746, OMG UML]

Baud (Bd): 1. A unit of modulation rate. *Note:* One baud corresponds to a rate of one unit interval per second, where the modulation rate is expressed as the reciprocal of the duration in seconds of the shortest unit interval. **2.** A unit of signaling speed equal to the number of discrete signal conditions, variations, or events per second. *Note 1:* If the duration of the unit interval is 20 milliseconds, the signaling speed is 50 bauds. If the signal transmitted during each unit interval can take on any one of *n* discrete states, the

bit rate is equal to the rate in bauds times $\log_2 n$. The technique used to encode the allowable signal states may be any combination of amplitude, frequency, or phase modulation, but it cannot use a further time-division multiplexing technique to subdivide the unit intervals into multiple subintervals. In some signaling systems, non-information-carrying signals may be inserted to facilitate synchronization; *e.g.,* in certain forms of binary modulation coding, there is a forced inversion of the signal state at the center of the bit interval. In these cases, the synchronization signals are included in the calculation of the rate in bauds but not in the computation of bit rate. *Note 2: Baud* is sometimes used as a synonym for *bit-per-second*. This usage is deprecated. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Bay: a substation consists of closely connected sub parts with some common functionality. Examples are the switchgear between an incoming or outgoing line, and the busbar, the bus coupler with its circuit breaker and related isolators and earthing switches, the transformer with its related switchgear between the two busbars representing the two voltage levels. The bay concept may be applied to 1½ breaker and ring bus substation arrangements by grouping the primary circuit breakers and associated equipment into a virtual bay. These bays comprise a power system subset to be protected, e.g. a transformer or a line end, and the control of its switchgear that has some common restrictions like mutual interlocking or well-defined operation sequences. The identification of such subparts is important for maintenance purposes (what parts may be switched off at the same time with minimum impact on the rest of the substation) or for extension plans (what has to be added if a new line is to be linked in). These subparts are called ‘bays’ and may be managed by devices with the generic names ’bay controller’ and have protection systems called ‘bay protection’. The concept of a bay is not commonly used in North America. The bay level represents an additional control level below the overall station level. [**IEC61850-2**]

BBS (Bulletin Board System): A bulletin board system (BBS) is a computer or an application dedicated to the sharing or exchange of messages or other files on a network. Originally an electronic version of the type of bulletin board found on the wall in many kitchens and work places, the BBS was used to post simple messages between users. The BBS became the primary kind of online community through the 1980s and early 1990s, before the World Wide Web arrived. [WhatIs.com].

bcc (blind carbon copy): A copy of an e-mail message sent to a recipient without the recipient's address appearing in the message. [**Common Usage**]

Behavior (of an object): A collection of actions with a set of constraints on when they may occur. [ISO/IEC 10746, OMG UML]

Behavioral compatibility: An object is behaviorally compatible with a second object with respect to a set of criteria if the first object can replace the second object without the environment being able to notice the difference in the objects' behavior on the basis of the set of criteria. [ISO/IEC 10746, OMG UML]

Bell 103: Asynchronous data transmission, full-duplex operation over 2-wire dialup or leased lines; 300-bps data rate. Comparable to ITU-T V.21.

Bell 212 A: Synchronous/ asynchronous data transmission, full-duplex operation over 2-wire leased or dialup lines; 1200-bps data rate. This versatile standard provides for efficient full-duplex operation over 2-wire dialup and leased lines. Comparable to ITU-T V.22.

BGP (Border Gateway Protocol): BGP is a protocol for exchanging routing information between gateway hosts (each with its own router) in a network of autonomous systems. BGP is often the protocol used between gateway hosts on the Internet. The routing table contains a list of known routers, the addresses they can reach, and a cost metric associated with the path to each router so that the best available route is chosen.
Hosts using BGP communicate using the Transmission Control Protocol (TCP) and send updated router table information only when one host has detected a change. Only the affected part of the routing table is sent. BGP-4, the latest version, lets adminstrators configure cost metrics based on policy statements. (BGP-4 is sometimes called BGP4, without the hyphen.) BGP communicates with autonomous (local) networks using Internal BGP (IBGP) since it doesn't work well with IGP. The routers inside the autonomous network thus maintain two routing tables: one for the interior gateway protocol and one for IBGP. BGP-4 makes it easy to use Classless Inter-Domain Routing (CIDR), which is a way to have more addresses within the network than with the current IP address assignment scheme. [WhatIs.com]. Compare with RIP and OSPF. See Routing Protocols.

Bilateral Agreement: Written statement signed by a pair of communicating parties that specifies what data may be exchanged between them. [**DOE Glossary of Electricity Terms]**

Bilateral Contract: A direct contract between the power producer and user or broker outside of a centralized power pool or power exchange. [**DOE Glossary of Electricity Terms]**

Bilateral Table: Bilateral tables are derived from Bilateral Agreements, and used in the ICCP protocol for one entity to establish the sets of data that are available to one other entity to access. [**IEC60870-6**]

Binary: Binary describes a numbering scheme in which there are only two possible values for each digit: 0 and 1. The term also refers to any digital encoding/decoding system in which there are exactly two possible states. In digital data memory, storage, processing, and communications, the 0 and 1 values are sometimes called "low" and "high," respectively. [WhatIs.com]

Binary File: A binary file is a file whose content must be interpreted by a program or a hardware processor that understands in advance exactly how it is formatted. That is, the

file is not in any externally identifiable format so that any program that wanted to could look for certain data at a certain place within the file. A program (or hardware processor) has to know exactly how the data inside the file is laid out to make use of the file. Binary files can be encoded (converted to ASCII) before being sent via email. [WhatIs.com]

BIND (Berkley Internet Name Domain): A Unix implementation of DNS.

Binder: An engineering object in a channel, which maintains a distributed binding between interacting basic engineering objects. [ISO/IEC 10746, OMG UML]

Binding: A contractual context, resulting from a given establishing behavior. [ISO/IEC 10746, OMG UML]

Binding Behavior: An establishing behavior between two or more interfaces (and hence between their supporting objects). "To bind" means "to execute a binding behavior". [ISO/IEC 10746, OMG UML]

Binding endpoint identifier: An identifier, in the naming context of a capsule, used by a basic engineering object to select one of the bindings in which it is involved, for the purpose of interaction. [ISO/IEC 10746, OMG UML]

Binding object: A computational object which supports a binding between a set of other computational objects. [ISO/IEC 10746, OMG UML]

Binding precondition: A set of conditions required for the successful execution of a binding behavior. [ISO/IEC 10746, OMG UML]

BinHex: BinHex is a utility for converting (encoding) Macintosh files into files that will travel well on networks either as files or e-mail attachments. Like Uuencode, BinHex encodes a file from its 8-bit binary or bit-stream representation into a 7-bit ASCII set of text characters. The recipient must decode it at the other end. Older e-mail utilities sometimes can't handle binary transmissions so text encoding ensures that a tranmission will get to an older system. BinHex specifically handles both resource and data forks in Macintosh files (which Uuencode doesn't). BinHex files have a suffix of ".hqx". (Earlier versions have the suffix ".hex".) [WhatIs.com]

Biometrics: Biometrics is the science and technology of measuring and statistically analyzing biological data. In information technology, biometrics usually refers to technologies for measuring and analyzing human body characteristics such as fingerprints, eye retinas and irises, voice patterns, facial patterns, and hand measurements, especially for authentication purposes. Often seen in science-fiction action adventure movies, face pattern matchers and body scanners seem about to emerge as replacements for computer passwords. Fingerprint and other biometric devices consist of a reader or scanning device, software that converts the scanned information into digital form, and wherever the data is to be analyzed, a database that stores the biometric data for comparison with previous records. When converting the biometric input, the software

identifies specific points of data as match points. The match points are processed using an algorithm into a value that can be compared with biometric data scanned when a user tries to gain access. Fingerprint, facial, or other biometric data can be placed on a smart card and users can present both the smartcard and their fingerprints or faces to merchants, banks, or telephones for an extra degree of authentication. There are privacy concerns about the gathering and sharing of biometric data, however. One suggestion to assuage those with privacy concerns is to encrypt biometric data when it's gathered and discard the original data to prevent identity theft. [WhatIs.com].

B-ISDN (Broadband ISDN): An Integrated Services Digital Network (ISDN) offering broadband capabilities. *Note 1:* B-ISDN is an ITU-T proposed (originally a CCITT-proposed) service that may (a) include interfaces operating at data rates from 150 to 600 Mb/s, (b) use asynchronous transfer mode (ATM) to carry all services over a single, integrated, high-speed packet-switched network, (c) have LAN interconnection capability, (d) provide access to a remote, shared disk server, (e) provide voice/ video /data teleconferencing, (f) provide transport for programming services, such as cable TV, (g) provide single-user controlled access to remote video sources, (h) handle voice/video telephone calls, and (i) access shop-at-home and other information services. *Note 2:* Techniques used in the B-ISDN include code conversion, information compression, multipoint connections, and multiple-connection calls. Current proposals use a service-independent call structure that allows flexible arrangement and modular control of access and transport edges. The service components of a connection can provide each user with independent control of access features and can serve as the basis of a simplified control structure for multipoint and multi-connection calls. Such a network might be expected to offer a variety of ancillary information processing functions. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Bit Binary digIT: *Abbreviation for* **binary digit. 1.** A character used to represent one of the two digits in the numeration system with a base of two, and only two, possible states of a physical entity or system. **2.** In binary notation either of the characters 0 or 1. **3.** A unit of information equal to one binary decision or the designation of one of two possible and equally likely states of anything used to store or convey information. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Bit-Oriented Protocol: A protocol in which a frame is seen as a bit stream. [**Common Usage]**

BizTalk: Industry initiative started by Microsoft to accelerate the adoption of XML in a consistent manner. The goal of BizTalk.org is to provide resources for learning about and using XML for Enterprise Application Integration (EAI) and business-to-business (B2B) document exchange, both within the enterprise and over the Internet. http://www.biztalk.org. Competing solution to ebXML and RosettaNet.

Blackstart Capability Plan: a documented procedure for a generating unit or station to go from a shutdown condition to an operating condition delivering electric power without assistance from the electric system. This procedure is only a portion of an overall system

restoration plan. (NERC "*Terms and Their Definitions As Used in the NERC Planning Standards*")

Bluetooth: A low-power, short-range, rf technology that allows the connection of intelligent communications devices or appliances in a household or an office in a short-range wireless network. Examples of Bluetooth applications are transferring data between cell phones, radios, pagers, personal digital assistants, notebook computers, video and still cameras, audio players, and local area networks. [T1 Glossary 2000: Glossary of Telecommunications Terms]

BNC: Bayonet Network Connector, Bayonet Nut Connector, British Naval Connector, or Bayone-Neill-Concelman. Coaxial cable connector used to connect a computer to a coaxial cable in a 10BASE-2 Ethernet network. 10BASE-2 is a 10 MHz baseband network on a cable extending up to 185 meters - the 2 is a rounding up to 200 meters - without a repeater cable. 10BASE-2 Ethernets are also known as "Thinnet", "thin Ethernet", or "cheapernets". The wiring in this type of Ethernet is thin, 50 ohm, baseband coaxial cable. The BNC connector in particular is generally easier to install and less expensive than other coaxial connectors. [WhatIs.com]

Bookmark: Using a World Wide Web browser, a bookmark is a saved link to a Web page that has been added to a list of saved links. When you are looking at a particular Web site or home page and want to be able to quickly get back to it later, you can create a bookmark for it. You can think of your browser as a book full of (millions of) Web pages and a few well-placed bookmarks that you have chosen. The list that contains your bookmarks is the "bookmark list" (and sometimes it's called a "hotlist."). [WhatIs.com]

BOOTP (Bootstrap Protocol): Application layer TCP/IP suite protocol that provides network configuration information. Defined in RFC951 and RFC1542 See UDP/IP. See also RFC1534, RFC2131.

Bot: A bot (short for "robot") is a program that operates as an agent for a user or another program or simulates a human activity. On the Internet, the most ubiquitous bots are the programs, also called spiders or crawlers, that access Web sites and gather their content for search engine indexes. [WhatIs.com]

Bounce: The return of a piece of mail because of an error in the way it was addressed or in its delivery. [**Common Usage**]

bps (bits per second)**:** In data communications, bits per second (abbreviated bps and, by some, bit/sec) is a common measure of data speed for computer modems and transmission carriers. As the term implies, the speed in bps is equal to the number of bits transmitted or received each second. Larger units are sometimes used to denote high data speeds. One kilobit per second (abbreviated Kbps in the U.S.; kbps elsewhere) is equal to 1,000 bps. One megabit per second (Mbps) is equal to 1,000,000 bps or 1,000 Kbps. [WhatIs.com].

BRI (Basic Rate Interface): ISDN basic-rate service consisting of two 64 Kbps B Channels and one 16 Kbps D Channel. Overhead is 48 kbps which adds up to 192 kbps. See also 2B+D. Each B-channel carries data, voice, and other services. The D-channel carries control and signaling information. The Basic Rate Interface consists of two 64 Kbps B-channels and one 16 Kbps D-channel. Thus, a Basic Rate Interface user can have up to 128 Kbps service. The Primary Rate Interface consists of 23 B-channels and one 64 Kpbs D-channel in the United States or 30 B-channels and 1 D-channel in Europe. [WhatIs.com].

Brick: In the Utility Communication Architecture (UCA™), a Brick is a module made up of Data Objects that focus on one function. Device Models are built by aggregating a group of Bricks, which provide all the required functionality. [**IEEE TR1550**]

Bridge: **1.** In communications networks, a device that (a) links or routes signals from one ring or bus to another or from one network to another, (b) may extend the distance span and capacity of a single LAN system, (c) performs no modification to packets or messages, (d) operates at the data-link layer of the OSI--Reference Model (Layer 2), (e) reads packets, and (f) passes only those with addresses on the same segment of the network as the originating user. **2.** A functional unit that interconnects two local area networks that use the same logical link control procedure, but may use different medium access control procedures. **3.** A balanced electrical network, *e.g.*, a Wheatstone bridge. *Note:* A bridge may be used for electrical measurements, especially resistances or impedances. **4.** *See* **hybrid coil.** [T1 Glossary 2000: Glossary of Telecommunications Terms]

Broadband: **1.** *Synonym [in analog technology]* **wideband. 2.** A descriptive term for evolving digital technologies that provide consumers a signal-switched facility offering integrated access to voice, high-speed data service, video-demand services, and interactive delivery services. [FCC] From T1 Glossary 2000: Glossary of Telecommunications Terms. In general, broadband refers to telecommunication in which a wide band of frequencies is available to transmit information. Because a wide band of frequencies is available, information can be multiplexed and sent on many different frequencies or channels within the band concurrently, allowing more information to be transmitted in a given amount of time (much as more lanes on a highway allow more cars to travel on it at the same time). Related terms are *wideband* (a synonym), baseband (a one-channel band), and narrowband (sometimes meaning just wide enough to carry voice, or simply "not broadband," and sometimes meaning specifically between 50 cps and 64 Kpbs). [WhatIs.com]

Broadcast: In general, to broadcast (verb) is to cast or throw forth something in all directions at the same time. A radio or television broadcast (noun) is a program that is transmitted over airwaves for public reception by anyone with a receiver tuned to the right signal channel. The term is sometimes used in e-mail or other message distribution for a message sent to all members, rather than specific members, of a group such as a department or enterprise. On the Internet, certain Web sites deliver original or redistributed broadcasts from existing radio and television stations, using streaming

sound or streaming video techniques, to Web users who visit the Web site or "tune it in" using a special program such as RealPlayer. Like publicly available radio and television broadcasts, Web broadcasts are available to anyone. The Web now offers live as well as prepackaged broadcasts and also plays back audio and video tapes. Some programming is scheduled and other prepackaged programs can be delivered on demand. Many Web users listen to music from a particular broadcasting site as they surf other sites on the Web. Broadcast should not be confused with unicast, a transmission to a specific receiver (like most e-mail messages); multicast, a transmission to multiple specific receivers (as in e-mail to a distribution list or a Web transmission over the MBone network to a specific group of receiving addresses); or anycast, a transmission to the nearest of a group of routers, used in Internet Protocol Version 6 (IPv6) as a technique for chain-updating a group of routers with new routing information. [WhatIs.com]

Broker: An entity that arranges the sale and purchase of electric energy, transmission, and other services between buyers and sellers, but does not take title to any of the power sold. [**DOE Glossary of Electricity Terms]**

Brouter: A combined bridge and router that operates without protocol restrictions, routes data using a protocol it supports, and bridges data it cannot route. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Browse: The activity of locating and displaying documents, primarily on the World Wide Web. Browsing is done with a browser. Browsing is frequently started by doing a search for a particular topic, only to find oneself hopping from one link to another just exploring the information available. Browsing is also called "Surfing the Net." [**Common Usage**]

Browser: Any computer software program for reading hypertext. *Note 1:* Browsers are usually associated with the Internet and the World Wide Web (WWW). *Note 2:* A browser may be able to access information in many formats, and through different services including HTTP and FTP. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Any computer software, such as Netscape Navigator or Microsoft Internet Explorer, that can be used to view documents on the Internet. Web browsers interpret the HTML computer language and display Web text and images. Not all Web browsers interpret HTML the same way. Thus, the exact same file may display differently when viewed on different Web browsers. Browsers are often referred to as "client software." [**Common Usage**]

Buffer Overflow: A buffer overflow occurs when a program or process tries to store more data in a buffer (temporary data storage area) than it was intended to hold. Since buffers are created to contain a finite amount of data, the extra information - which has to go somewhere - can overflow into adjacent buffers, corrupting or overwriting the valid data held in them. Although it may occur accidentally through programming error, buffer overflow is an increasingly common type of security attack on data integrity. In buffer overflow attacks, the extra data may contain codes designed to trigger specific actions, in

effect sending new instructions to the attacked computer that could, for example, damage the user's files, change data, or disclose confidential information. Buffer overflow attacks are said to have arisen because the C programming language supplied the framework, and poor programming practices supplied the vulnerability. [WhatIs.com].

Bus: a communication system connection between IEDs with communication facilities. [**IEC61850-2**]

Bus Topology: A network topology in which a single cable is used to carry the networks signals. Computing devices are attached to the central cable via taps. [**Common Usage**]

Business-to-Business (B2B): On the Internet, B2B (business-to-business), also known as e-biz, is the exchange of products, services, or information between businesses rather than between businesses and consumers. Although early interest centered on the growth of retailing on the Internet (sometimes called e-tailing), forecasts are that B2B revenue will far exceed business-to-consumers (B2C) revenue in the near future. According to studies published in early 2000, the money volume of B2B exceeds that of e-tailing by 10 to 1. Over the next five years, B2B is expected to have a compound annual growth of 41%. The Gartner Group estimates B2B revenue worldwide to be $7.29 trillion dollars by 2004. In early 2000, the volume of investment in B2B by venture capitalists was reported to be accelerating sharply although profitable B2B sites were not yet easy to find. [WhatIs.com]

Bypass: Bypass, in general, means either to go around something by an external route rather than going through it, or the means of accomplishing that feat. In network security, a bypass is a flaw in a security system that allows an attacker to circumvent security mechanisms to get system or network access. The actual point of entry is through a mechanism (either a hardware device or program, even just a piece of code) that enables the user to access the system without going through the security clearance procedures (such as authentication) that were set up by the system administrator. A bypass may be a mechanism put in place by an attacker, a flaw in the design, or an alternate access route left in place by developers. A bypass that is purposefully put in place as a means of access for authorized users is called a back door or a trap door. A crypto bypass is a flaw that allows data to circumvent the encryption process and escape, unencrypted, as plaintext. [WhatIs.com]

Byte: A sequence of contiguous bits (usually 8) considered as a unit. *Note:* In pre-1970 literature, *"byte"* referred to a variable-length bit string. Since that time, the usage has changed so that now it almost always refers to an 8-bit string. This usage predominates in computer and data transmission literature; when so used, the term is synonymous with *" octet."* [T1 Glossary 2000: Glossary of Telecommunications Terms]

C

C: C is a structured, procedural programming language that has been widely used both for operating systems and applications and that has had a wide following in the academic community. [WhatIs.com]. Standardized in ISO/IEC 9899 (replaces ANSI Standard X3.159-1989) and also supported by ANSI docstore: Product: 'Programming Languages - C'.

C# (C-sharp): is a new object-oriented programming language from Microsoft, which aims to combine the computing power of C++ with the programming ease of Visual Basic. C# is based on C++ and contains features similar to those of Java.
C# is designed to work with Microsoft's .NET platform. [WhatIs.com]. It has been submitted as a proposed standard to ECMA. Visual Studio .NET: C# Introduction

C++: C++ is an object-oriented programming (OOP) language that is viewed by many as the best language for creating large-scale applications. C++ is a superset of the C language. A related programming language, Java, is based on C++ but optimized for the distribution of program objects in a network such as the Internet. Java is somewhat simpler and easier to learn than C++ and has characteristics that give it other advantages over C++. [WhatIs.com] C++ was created by Bjarne Stroustrup released in 1985. Standardized in ISO/IEC 14882:1998 and also available from ANSI docstore: Product: 'Programming languages - C++'..

CA: see Certificate Authority

Cable: **1.** An assembly of one or more insulated conductors, or optical fibers, or a combination of both, within an enveloping jacket. *Note 1:* A cable is constructed so that the conductors or fibers may be used singly or in groups. *Note 2:* Certain types of communications cables, especially long submarine cables but also terrestrial cables, whether the communications media are metallic or optical fiber, may contain metallic conductors that supply power to repeaters (amplifiers). **2.** A message sent by cable, or by any means of telegraphy (including wireless means). [T1 Glossary 2000: Glossary of Telecommunications Terms]

Cable Modem: In CATV systems, a bidirectional high-speed digital communications interface, located on a subscriber's or user's premises, and used, for example, for Internet access or other digital communications. [T1 Glossary 2000: Glossary of Telecommunications Terms] Because the coaxial cable used by cable TV provides much greater bandwidth than Cat-3 telephone lines, it can also provide much higher speeds. Cable modems can receive data at a peak speed between 4 Mbps and 30 Mbps and send it at 512 Kbps to 10 Mbps. [**Common Usage**]

Cache memory: A buffer, smaller and faster than main storage, used to hold a copy of instructions and data in main storage that are likely to be needed next by the processor and that have been obtained automatically from main storage. [T1 Glossary 2000: Glossary of Telecommunications Terms] Every time you visit a web site, your web browser keeps a cached copy of the text and pictures that it will use for faster access if you visit again and the web site has not been changed.

Caching: A method of automatically saving copies of files either in your computer's memory or on its hard disk. Caching enables you to recall previously visited Web sites much more quickly than downloading a new page from the Web.

CAP (Carrierless Amplitude/Phase Modulation) is a proprietary standard implemented by Globespan Semiconductor. While the name specifies that the modulation is 'carrierless' an actual carrier is imposed by the transmit band shaping filter through which the outbound symbols are filtered. Hence CAP is algorithmically identical to QAM. Used by HDSL.

Capability: The maximum load that a generating unit, generating station, or other electrical apparatus can carry under specified conditions for a given period of time without exceeding approved limits of temperature and stress. [**DOE Glossary of Electricity Terms]**

Capacity: The amount of electric power delivered or required for which a generator, turbine, transformer, transmission circuit, station, or system is rated by the manufacturer. [**DOE Glossary of Electricity Terms]**

Capacity (Purchased): The amount of energy and capacity available for purchase from outside the system. [**DOE Glossary of Electricity Terms]**

Capacity Charge: An element in a two-part pricing method used in capacity transactions (energy charge is the other element). The capacity charge, sometimes called Demand Charge, is assessed on the amount of capacity being purchased. [**DOE Glossary of Electricity Terms]**

Capsule: A configuration of engineering objects forming a single unit for the purpose of encapsulation of processing and storage. [ISO/IEC 10746, OMG UML]

Capsule manager: An engineering object that manages the engineering objects in a capsule. [ISO/IEC 10746, OMG UML]

Carrier: In a frequency stabilized system, the sinusoidal component of a modulated wave whose frequency is independent of the modulating wave; or the output of a transmitter when the modulating wave is made zero; or a wave generated at a point in the transmitting system and subsequently modulated by the signal; or a wave generated locally at the receiving terminal which when combined with the side bands in a suitable

detector, produces the modulating wave. [47CFR] *Synonym* **common carrier.** [T1 Glossary 2000: Glossary of Telecommunications Terms]

Cascading: the uncontrolled successive loss of system elements triggered by an incident at any location. Cascading results in widespread electric service interruption, which cannot be restrained from sequentially spreading beyond an area predetermined by appropriate studies. (NERC "*Terms and Their Definitions As Used in the NERC Planning Standards*")

Carrier Sense Multiple Access (CSMA): A network control scheme in which a node verifies the absence of other traffic before transmitting. [T1 Glossary 2000: Glossary of Telecommunications Terms] CDMA is a "spread spectrum" technology, allowing many users to occupy the same time and frequency allocations in a given band/space. As its name implies, CDMA assigns unique codes to each communication to differentiate it from others in the same spectrum. In a world of finite spectrum resources, CDMA enables many more people to share the airwaves at the same time than do alternative technologies. The CDMA air interface is used in both 2G and 3G networks. 2G CDMA standards are branded cdmaOne and include IS-95A and IS-95B. CDMA is the foundation for 3G services: the two dominant IMT-2000 standards, CDMA2000 and WCDMA, are based on CDMA. [**Common Usage**]

Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA): A network control protocol in which (a) a carrier sensing scheme is used, (b) a data station that intends to transmit sends a jam signal, (c) after waiting a sufficient time for all stations to receive the jam signal, the data station transmits a frame, and (d) while transmitting, if the data station detects a jam signal from another station, it stops transmitting for a random time and then tries again. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Carrier Sense Multiple Access/Collision Detection (CSMA/CD): A LAN access method in which contention between two or more stations is resolved by collision detection. When two stations transmit at the same time, they both stop and signal that a collision has occurred. Each then tries again after waiting a predetermined time period, usually several microseconds. See IEEE 802.3.

CASE (Computer-Aided Software Engineering): *Acronym for* **computer-aided software engineering, computer-aided systems engineering.** Software used for the automated development of systems software, *i.e.*, computer code. *Note 1:* CASE functions include analysis, design, and programming. *Note 2:* CASE tools automate methods for designing, documenting, and producing structured computer code in the desired programming language. [T1 Glossary 2000: Glossary of Telecommunications Terms] CASE is the use of a computer-assisted method to organize and control the development of software, especially on large, complex projects involving many software components and people. Using CASE allows designers, code writers, testers, planners, and managers to share a common view of where a project stands at each stage of development. CASE helps ensure a disciplined, check-pointed process. A CASE tool may portray progress (or lack of it) graphically. It may also serve as a repository for or be

linked to document and program libraries containing the project's business plans, design requirements, design specifications, detailed code specifications, the code units, test cases and results, and marketing and service plans. [**Common Usage**]

Catatonic: Describes a condition of suspended animation in which something is so hung that it makes no response. If you are typing on a terminal and suddenly the computer does not even echo the letters back to the screen, let alone do what you are asking it to, then the computer is suffering from catatonia. [**Common Usage**]

Category 1: A cabling standard for basic twisted-pair cabling used in telephone systems. Inadequate for all but voice and low-speed data communication. Maximum data rate is 1 Mbps. [WhatIs.com]

Category 2: Suitable for voice and data transmission of up to 4 Mbps. Mainly used in the IBM Cabling System for Token Ring networks. [WhatIs.com]

Category 3: The ANSI/EIA/TIA-568 designation for 100-ohm unshielded twisted-pair cables and associated connecting hardware whose characteristics are specified for data transmission up to 16 Mb/s. [T1 Glossary 2000: Glossary of Telecommunications Terms] Required to have at least three twists per foot . It is now the standard cable in most telephone systems. [**Common Usage**]

Category 4: The ANSI/EIA/TIA-568 designation for 100-ohm unshielded twisted-pair cables and associated connecting hardware whose characteristics are specified for data transmission up to 20 Mb/s. [T1 Glossary 2000: Glossary of Telecommunications Terms] Commonly used for 16-Mbps Token Ring networks. [WhatIs.com]

Category 5: The ANSI/EIA/TIA-568 designation for 100-ohm unshielded twisted-pair cables and associated connecting hardware whose characteristics are specified for data transmission up to 100 Mb/s. [T1 Glossary 2000: Glossary of Telecommunications Terms] Commonly used for 4 and 16-Mbps Token Ring and 10xxBase-T Ethernet networks. Maximum distances for 10xxbase-T are 100m, 100m, 25m for 10, 100, and 1000Base-T respectively. Standard defined by TIA/EIA-568-A. In TIA/EIA-568-B, Category 5e replaces Category 5. [WhatIs.com]

Category 5e: Enhanced Category 5 cable. A eight-conductor (four pairs) cabling standard for UTP/STP wiring with data transmission rates of up to 1000 Mbps. Commonly used in 10, 100, and 1000Base-T Ethernet networks. Maximum distance is 100m for all three types of Ethernet. Handles voice or data at 100MHz over 22 or 24 AWG wire. Addendum 5 to TIA/EIA-568-A specifies enhanced category 5 (category 5e) performance requirements. [WhatIs.com]

Category 6: Category 6/class E standards describe a new performance range for unshielded and screened twisted-pair cabling. Category 6/class E is intended to specify the best performance that UTP and STP cabling solutions can be designed to deliver.

Category 6/class E is specified in the frequency range of at least 1-250 MHz with data transmission rates of up to 1000 Mbps. [WhatIs.com]

Category 7: The Category 7/class F emerging standards describe a new performance range. Category 7 cables will be "fully shielded", with individually screened twisted-pairs and an overall shield (SSTP). Category 7/class F is specified in the frequency range of at least 1-600 MHz with data transmission rates of up to 1000 Mbps. [WhatIs.com]

cc (carbon copy): A copy of an e-mail message sent to a person(s) who is not the primary recipient(s). [**Common Usage**]

CCAPI: Control Center Application Program Interface, a group originally sponsored by EPRI to develop the Common Information Model (CIM), and to support the IEC TC57 WG13 development work on IEC 61970, which is the international standardization of CIM and the APIs to CIM components. [**IEC61970**]

CCITT: Comité Consultatif International Télégraphique et Téléphonique (CCITT) is the French acronym that translates to the International Telegraph and Telephone Consultative Committee. It is an international body centered in Geneva that has created the world wide modem standards. It renamed itself to ITU-T - International Telecommunications Union: Telecommunications Standards Sector. [Welcome to the International Telecommunication Union]

CDC: Common Data Class

CDMA (Code Division Multiple Access): See Carrier Sense Multiple Access.

CDPD (Cellular Digital Packet Data): CDPD is a specification for supporting wireless access to the Internet and other public packet-switched networks. cellular telephone and modem providers that offer CDPD support make it possible for mobile users to get access to the Internet at up to 19.2 Kbps . Because CDPD is an open specification that adheres to the layered structure of the Open Systems Interconnection (OSI) model, it has the ability to be extended in the future. CDPD supports both the Internet's Internet Protocol protocol and the ISO Connectionless Network Protocol (CLNP). CDPD also supports IP multicast (one-to-many) service. With multicast, a company can periodically broadcast company updates to sales and service people on the road or a news subscription service can transmit its issues as they are published. It will also support the next level of IP, IPv6. [WhatIs.com]

CEFACT: see UN/CEFACT

CERN (Centre Européen de Recherche Nucléaire): CERN is the European Organization for Nuclear Research, the world's largest particle physics centre. Founded in 1954, the laboratory was one of Europe's first joint ventures, and has become a shining example of international collaboration. From the original 12 signatories of the CERN convention,

membership has grown to the present 20 Member States. Birthplace of the World Wide Web. http://www.cern.ch

CERT: The Computer Emergency Response Team was established at Carnegie-Mellon University after the 1988 Internet worm attack. http://www.cert.org/

Certificate: **1.** In cryptography, the public key and the identity of an entity, with other information, rendered unforgeable by digitally signing the entire information with the private key of the issuing certification authority. [After X9.42] *Synonym* **digital certificate. 2.** [A] record holding security information about an information-system (IS) user and vouches to the truth and accuracy of the information it contains. [INFOSEC-99] [T1 Glossary 2000: Glossary of Telecommunications Terms] A data structure which is digitally signed by some party which users of the certificate will trust. Typically certificates are used for the distribution of public keys for PKI, and are managed by Certificate Authorities. The contents of a certificate include at least the name of the certificate owner, the public key, the expiration date of the certificate, the trusted certificate authority, and the digital signature of the certificate authority. [**Common Usage**]

Certification Authority (CA): **1.** In cryptography, a center trusted by one or more agencies or individuals to create and assign certificates and, optionally, to create user's keys. [After X9.31] **2.** In secure communications, a trusted person or entity who issues certificates (also called "public-key certificates") for encryption purposes. **3.** An independent party identifying and certifying payers and payees for real-time credit card transactions in electronic commerce. [Mattila] **4.** Third level of the Public Key Infrastructure (PKI) Certification Management Authority responsible for issuing and revoking user certificates, and exacting compliance to the PKI policy as defined by-the parent Policy Creation Authority (PCA). [INFOSEC-99] [T1 Glossary 2000: Glossary of Telecommunications Terms] Also known as a certificate authority, the CA is an authority in a network that issues and manages security credentials and public keys for message encryption. As part of a public key infrastructure (PKI), a CA checks with a registration authority (RA) to verify information provided by the requestor of a digital certificate. If the RA verifies the requestor's information, the CA can then issue a digital certificate used to create digital signatures and public-private key pairs. Depending on the public key infrastructure implementation, the certificate includes the owner's public key, the expiration date of the certificate, the owner's name, and other information about the public key owner. List of CAs. List of CAs 2.

Certificate Revocation List (CRL): Certificate Revocation List (CRL) is one of two common methods when using a public key infrastructure for maintaining access to servers in a network. The other, newer method, which has superseded CRL in some cases, is Online Certificate Status Protocol (OCSP). The CRL is exactly what its name implies: a list of subscribers paired with digital certificate status. The list enumerates revoked certificates along with the reason(s) for revocation. The dates of certificate issue, and the entities that issued them, are also included. In addition, each list contains a proposed date for the next release. When a potential user attempts to access a server, the

server allows or denies access based on the CRL entry for that particular user. The main limitation of CRL is the fact that updates must be frequently downloaded to keep the list current. OCSP overcomes this limitation by checking certificate status in real time. [WhatIs.com]

CGI (Common Gateway Interface): A specification for transferring information between a World Wide Web server and a CGI program. A CGI program is any program designed to accept and return data that conforms to the CGI specification. The program could be written in any programming language, including C, Perl, Java, or Visual Basic. [W3C: CGI - Common Gateway Interface]

Chain (of actions): A sequence of actions within an activity where, for each adjacent pair of actions, occurrence of the first action is necessary for the occurrence of the second action. [ISO/IEC 10746, OMG UML]

Channel: A configuration of stubs, binders, protocol objects and interceptors providing a binding between a set of interfaces to basic engineering objects, through which interaction can occur. [ISO/IEC 10746, OMG UML]

CHAP (Challenge-Handshake Authentication Protocol): is a more secure procedure for connecting to a system than the Password Authentication Procedure (PAP). Here's how CHAP works:

- After the link is made, the server sends a challenge message to the connection requestor. The requestor responds with a value obtained by using a one-way hash function.
- The server checks the response by comparing it its own calculation of the expected hash value.
- If the values match, the authentication is acknowledged; otherwise the connection is usually terminated. [WhatIs.com]

CHAP is one of two methods used in a PPP connection to authenticate the user. CHAP uses an encryption method of sending the user name and password and thus more secure than its alternative, PAP. CHAP is defined in IETF RFC 1994.

Characteristic Impedance (Ohms): A value based on the inherent conductance, resistance, capacitance and inductance of a cable that represents the impedance of an infinitely long cable. When the cable is cut to any length and terminated with this Characteristic Impedance, measurements of the cable will be identical to values obtained from the infinite length cable. That is to say that the termination of the cable with this impedance gives the cable the appearance of being infinite length, allowing no reflections of the transmitted signal. If termination is required in a system, the termination impedance value should match the Characteristic Impedance of the cable. [**Common Usage**]

Chat: A chat room is a Web site, part of a Web site, or part of an online service such as America Online, that provides a venue for communities of users with a common interest to communicate in real time. Forums and discussion groups, in comparison, allow users to post messages but don't have the capacity for interactive messaging. Most chat rooms don't require users to have any special software; those that do, such as Internet Relay Chat (IRC) allow users to download it from the Internet. [WhatIs.com]

Checkpoint: An object template derived from the state and structure of an engineering object that can be used to instantiate another engineering object, consistent with the state of the original object at the time of check pointing. [ISO/IEC 10746, OMG UML]

Check-pointing: Creating a checkpoint. Checkpoints can only be created when the engineering object involved satisfies a pre-condition stated in a check-pointing policy. [ISO/IEC 10746, OMG UML]

Checksum: **1.** The sum of a group of data items, which sum is used for checking purposes. *Note 1:* A checksum is stored or transmitted with the group of data items. *Note 2:* The checksum is calculated by treating the data items as numeric values. *Note 3:* Checksums are used in error detecting and correcting. **2.** [The] value computed on data to detect error or manipulation during transmission. *See* **hash total.** [INFOSEC-99] [T1 Glossary 2000: Glossary of Telecommunications Terms]

CIM: Common Information Model

Cipher: **1.** Any cryptographic system in which arbitrary symbols, or groups of symbols, represent units of plain text or in which units of plain text are rearranged, or both. [INFOSEC-99] **2.** The result of using a cipher. *Note:* An example of a cipher is an enciphered message or text. [T1 Glossary 2000: Glossary of Telecommunications Terms] Examples of ciphers are; AES, DES, 3DES, IDEA, RC4, and RSA.

Circuit: A conductor or a system of conductors through which electric current flows. [**DOE Glossary of Electricity Terms]**

Circuit Switching: A type of communications in which a dedicated channel (or circuit) is established for the duration of a transmission. The Telephone system is using circuit switching with different multiplexing; e.g., TDM, FDM. See also ISDN.

CIS (Component Interface Specification): specifies the functional requirements for interfaces that a component (or application) should implement to be able to exchange information with other components (or applications) and/or to access publicly available data in a standard way. Parts 4 and 5 of the IEC 61970 international standard specify the CIS for the CIM. [**IEC61970**]

CIS (Customer Information System): usually containing customer addresses, billing information, and sometimes the connection between a customer and a distribution transformer. [**Common Usage**]

Class: A class is a set of objects that share a common structure and common behavior (the same attributes, operations, relationships and semantics). [**IEC61850-2]** In object-oriented programming, a class is a template definition of the methods and variables in a particular kind of object. Thus, an object is a specific instance of a class; it contains real values instead of variables. The class is one of the defining ideas of object-oriented programming. Among the important ideas about classes are:

- A class can have subclasses that can inherit all or some of the characteristics of the class. In relation to each subclass, the class becomes the superclass.
- Subclasses can also define their own methods and variables that are not part of their superclass.
- The structure of a class and its subclasses is called the class hierarchy.

Class (of <X>s): The set of all <X>s satisfying a type. The elements of the set are referred to as members of the class. [ISO/IEC 10746, OMG UML]

Click: A verb meaning "to select something with a mouse". [**Common Usage**]

Client: **1.** In networking, a software application that allows the user to access a service from a server computer, *e.g.*, a server computer on the Internet or a LAN. **2.** A computer, *e.g.*, a desktop computer on a LAN, that is so served. [T1 Glossary 2000: Glossary of Telecommunications Terms] A client is the requesting program or user in a client/server relationship. For example, the user of a Web browser is effectively making client requests for pages from servers all over the Web. The browser itself is a client in its relationship with the computer that is getting and returning the requested HTML file. The computer handling the request and sending back the HTML file is a server. [WhatIs.com]

Client object: An object which requests that a function be performed by another object. [ISO/IEC 10746, OMG UML]

Client Program: A computer program that connects to a server and communicates to a specific server program. e-mail is an example. The e-mail client connects to the e-mail server to send and receive e-mail messages.

Client/Server: Any hardware / software combination that generally adheres to a client-server architecture, regardless of the type of application. [T1 Glossary 2000: Glossary of Telecommunications Terms] Client/server describes the relationship between two computer programs in which one program, the client, makes a service request from another program, the server, which fulfills the request. Although the client/server idea can be used by programs within a single computer, it is a more important idea in a network. In a network, the client/server model provides a convenient way to interconnect programs that are distributed efficiently across different locations. [WhatIs.com]

Client/Server Architecture: Any network-based software system that uses client software to request a specific service, and corresponding server software to provide the

service from another computer on the network. T1 Glossary 2000: Glossary of Telecommunications Terms]

CLNS: Connectionless Network Service. A network service that transfers information between end users without establishing a logical connection or virtual circuit between those specific users. [After T1.110-1987] T1 Glossary 2000: Glossary of Telecommunications Terms] CLNP was developed by ISO CLNS is part of OSI, is at Layer 3, and does not require a circuit before transmitting the packet. [ISO]

Cloning: Instantiating a cluster from a cluster checkpoint. [ISO/IEC 10746, OMG UML]

CLTP: ISO 8602 Connectionless Transport Protocol. [ISO]

Cluster: A configuration of basic engineering objects forming a single unit for the purposes of deactivation, check pointing, reactivation, recovery and migration. [ISO/IEC 10746, OMG UML]

Cluster checkpoint: A cluster template containing checkpoints of the basic engineering objects in a cluster. [ISO/IEC 10746, OMG UML]

Cluster manager: An engineering object that manages the basic engineering objects in a cluster. [ISO/IEC 10746, OMG UML]

Cluster template: An object template for a configuration of objects and any activity required to instantiate those objects and establish initial bindings. [ISO/IEC 10746, OMG UML]

Clustering: In computers, clustering is the use of multiple computers, typically PCs or UNIX workstations, multiple storage devices, and redundant interconnections, to form what appears to users as a single highly available system. Cluster computing can be used for load balancing as well as for high availability. Advocates of clustering suggest that the approach can help an enterprise achieve 99.999 availability in some cases. One of the main ideas of cluster computing is that, to the outside world, the cluster appears to be a single system. A common use of cluster computing is to load balance traffic on high-traffic Web sites. A Web page request is sent to a "manager" server, which then determines which of several identical or very similar Web servers to forward the request to for handling. Having a Web farm (as such a configuration is sometimes called) allows traffic to be handled more quickly. [WhatIs.com]

CMIP: Common Management Information Protocol (CMIP) is a network management protocol built on the Open Systems Interconnection (OSI) communication model. The related Common Management Information Services (CMIS) defines services for accessing information about network objects or devices, controlling them, and receiving status reports. [WhatIs.com]

CMOT (Common Management Information Protocol over TCP): was at one time an alternative to SNMP. However, it is today labeled "Historic". Defined in RFC1189 (obsoleted RFC1095).

Coaxial Cable: A transmission medium consisting of a conducting core, insulating material and a second conducting sheath. See also RG-8, RG-9, RG-11, RG-58, RG-59, and RG-6.

Cogenerator: A generating facility that produces electricity and another form of useful thermal energy (such as heat or steam), used for industrial, commercial, heating, or cooling purposes. To receive status as a qualifying facility (QF) under the Public Utility Regulatory Policies Act (PURPA), the facility must produce electric energy and "another form of useful thermal energy through the sequential use of energy," and meet certain ownership, operating, and efficiency criteria established by the Federal Energy Regulatory Commission (FERC). (See the Code of Federal Regulations, Title 18, Part 292.) [**DOE Glossary of Electricity Terms]**

Collaboration Diagram: A diagram that shows interactions organized around the structure of a model, using either classifiers and associations or instances and links. Unlike a sequence diagram, a collaboration diagram shows the relationships among the instances. Sequence diagrams and collaboration diagrams express similar information, but show it in different ways. [**OMG UML Spec**]

Collision Detection: In LAN technology, the act of detecting when a collision has occurred. This typically occurs when a workstation does not receive an acknowledgment from a receiving station. Collision detection is an integral part of the CSMA/CD access method. [**Common Usage**]

Collision: In LAN technology, two stations attempting to use the same transmission medium at the same time. [**Common Usage**]

COM (Component Object Model): Microsoft's framework for developing and supporting program component objects. It is aimed at providing similar capabilities to those defined in CORBA. COM provides the underlying services of interface negotiation, life cycle management (determining when an object can be removed from a system), licensing, and event services (putting one object into service as the result of an event that has happened to another object). COM includes COM+, DCOM, MSMQ, MTS, and ActiveX controls. [Microsoft]

COM port: The communications port (serial port) on the back of a computer that allows for devices such as modems to connected and used by the computer. The COM port can also be internal, as specified by the operating system of the computer and the device. [**Common Usage**]

COM+: is an extension to the Component Object Model (COM). COM+ is a component object model or an object model with a set of services for COM-based applications. The

COM+ architecture integrates COM and MTS, with the following feature areas; Servers, Transactions, Security, Administration, Load Balancing, Queued Components, and Events. [Microsoft]

Combined Cycle: An electric generating technology in which electricity is produced from otherwise lost waste heat exiting from one or more gas (combustion) turbines. The exiting heat is routed to a conventional boiler or to a heat recovery steam generator for utilization by a steam turbine in the production of electricity. This process increases the efficiency of the electric generating unit. [**DOE Glossary of Electricity Terms]**

Combined Cycle Unit: An electric generating unit that consists of one or more combustion turbines and one or more boilers with a portion of the required energy input to the boiler(s) provided by the exhaust gas of the combustion turbine(s). [**DOE Glossary of Electricity Terms]**

Combined Pumped-Storage Plant: A pumped-storage hydroelectric power plant that uses both pumped water and natural streamflow to produce electricity. [**DOE Glossary of Electricity Terms]**

Commercial [Customer]: The commercial sector is generally defined as nonmanufacturing business establishments, including hotels, motels, restaurants, wholesale businesses, retail stores, and health, social, and educational institutions. The utility may classify commercial service as all consumers whose demand or annual use exceeds some specified limit. The limit may be set by the utility based on the rate schedule of the utility. [**DOE Glossary of Electricity Terms]**

Committee T1: Established in February 1984, Committee T1 develops technical standards and reports regarding interconnection and interoperability of telecommunications networks at interfaces with end-user systems, carriers, information and enhanced-service providers, and customer premises equipment (CPE). Committee T1 is sponsored by the Alliance for Telecommunications Industry Solutions and accredited by the American National Standards Institute (ANSI) to create network interconnections and interoperability standards for the United States. Committee T1 has six technical subcommittees that are advised and managed by the T1 Advisory Group (T1AG). Each technical subcommittee develops draft standards and technical reports in its designated areas of expertise. The subcommittees recommend positions on matters under consideration by other national and international standards bodies. Technical subcommittees and their areas of expertise are:

T1A1 - Performance and Signal Processing
T1E1 - Interfaces, Power and Protection of Networks
T1M1 - Internetwork Operations, Administration, Maintenance & Provisioning
T1P1 - Wireless/Mobile Services and Systems
T1S1 - Services, Architectures and Signaling
T1X1 - Digital Hierarchy and Synchronization

[T1 Glossary 2000: Glossary of Telecommunications Terms]

Commitment: An action resulting in an obligation by one or more of the participants in the act to comply with a rule or perform a contract. [ISO/IEC 10746, OMG UML]

Common Carrier: In a telecommunications context, a telecommunications company that holds itself out to the public for hire to provide communications transmission services. *Note:* In the United States, such companies are usually subject to regulation by Federal and state regulatory commissions. *Synonyms* **carrier, commercial carrier, communications common carrier,** *[and, loosely]* **interexchange carrier.** [T1 Glossary 2000: Glossary of Telecommunications Terms] A provider of telecommunication transmission capabilities available to the general public, regulated by the FCC. [**Common Usage**]

Common Data Class (CDC): IEC61850 defines common data classes in Part 7-3, which form the basis of all data objects defined in Logical Nodes in Part 7-4. [**IEC61850-2**]

Common Information Model (CIM) for DMTF: The Common Information Model (CIM) is a computer industry standard for defining device and application characteristics so that system administrators and management programs will be able to control devices and applications from different manufacturers or sources in the same way. For example, a company that purchased different kinds of storage devices from different companies would be able to view the same kind of information (such as: device name and model, serial number, capacity, network location, and relationship to other devices or applications) about each of them or be able to access the information from a program. CIM takes advantage of the Extensible Markup Language (XML). Hardware and software makers choose one of several defined XML schemas (information structures) to supply CIM information about their product. CIM was developed by an industry group, the Distributed (formerly Desktop) Management Task Force (DMTF), as part of an initiative called Web-Based Enterprise Management (WBEM). CIM is intended to be more comprehensive than earlier models now in use, the Simple Network Management Protocol (SNMP) and Desktop Management Interface (DMI). With CIM, relationship information (what's connected to what) can be used to help trace the source and status of problems. [WhatIs.com] It should not be confused with the utility power system model standard which is also termed CIM.

Common Information Model (CIM): The CIM is an object model of the utility power system, focused primarily on providing a means for EMS applications to exchange power system data. It was initially developed under the sponsorship of EPRI and now is an international standard (IEC 61970). [**IEC61970**]

Communication: The conveyance of information between two or more objects as a result of one or more interactions, possibly involving some intermediate objects. [ISO/IEC 10746, OMG UML]

Communication interface: An interface of a protocol object that can be bound to an interface of either an interceptor object or another protocol object at an inter-working reference point. [ISO/IEC 10746, OMG UML]

Communication management: Management of objects which support the communication between objects within an ODP system. [ISO/IEC 10746, OMG UML]

Communications domain: A set of protocol objects capable of inter-working. [ISO/IEC 10746, OMG UML]

Community: A configuration of objects formed to meet an objective. The objective is expressed as a contract that specifies how the objective can be met. [ISO/IEC 10746, OMG UML]

Community object: A composite enterprise object that represents a community. Components of a community object are objects of the community represented. [ISO/IEC 10746, OMG UML]

Competitive Transition Charge: A non-bypassable charge levied on each customer of a distribution utility, including those who are served under contracts with nonutility suppliers, for recovery of a utility's transition costs. [**DOE Glossary of Electricity Terms]**

Compliance: Adherence to requirements for the necessary consistency of one member of the family of ODP standards with another (such as the RM-ODP). Compliance is established during the standardization process. If a specification is compliant, directly or indirectly, with some other standards then the propositions that are true in those standards are also true in a conformant implementation of the specification. [ISO/IEC 10746, OMG UML]

Composite object: An object expressed as a composition [ISO/IEC 10746, OMG UML]. Composition (of objects): A combination of two or more objects yielding a new object, at a different level of abstraction. [ISO/IEC 10746, OMG UML]

Composition (of behaviors): A combination of two or more behaviors yielding a new behavior. [ISO/IEC 10746, OMG UML]

Component: A modular, deployable, and replaceable part of a system that encapsulates implementation and exposes a set of interfaces. A component is typically specified by one or more classifiers (e.g., implementation classes) that reside on it, and may be implemented by one or more artifacts (e.g., binary, executable, or script files). [**OMG UML Spec**]

Compression: **1.** Increasing the amount of data that can be stored in a given domain, such as space, time, or frequency, or contained in a given message length. **2.** Reducing the amount of storage space required to store a given amount of data, or reducing the

length of message required to transfer a given amount of information. *Note 1:* Data compression may be accomplished by simply squeezing a given amount of data into a smaller space, for example, by increasing packing density or by transferring data on punched cards onto magnetic tape. *Note 2:* Data compression does not reduce the amount of data used to represent a given amount of information, whereas data compaction does. Both data compression and data compaction result in the use of fewer data elements for a given amount of information. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Computer Security: **1.** Measures and controls that ensure confidentiality, integrity, and availability of information-system (IS) assets including hardware, software, firmware, and information being processed, stored, and communicated. [INFOSEC-99] *Synonym* **automated information systems security. 2.** The application of hardware, firmware and software security features to a computer system in order to protect against, or prevent, the unauthorized disclosure, manipulation, deletion of information or denial of service. **3.** The protection resulting from all measures to deny unauthorized access and exploitation of friendly computer systems. [JP1-02] [T1 Glossary 2000: Glossary of Telecommunications Terms]

Computational interface template: An interface template for either a signal interface, a stream interface or an operation interface. A computational interface template comprises a signal, a stream or an operation interface signature as appropriate, a behavior specification and an environment contract specification. [ISO/IEC 10746, OMG UML]

Computational object template: An object template which comprises a set of computational interface templates which the object can instantiate, a behavior specification and an environment contract specification. [ISO/IEC 10746, OMG UML]

Computational viewpoint: A viewpoint on an ODP system and its environment which enables distribution through functional decomposition of the system into objects which interact at interfaces. [ISO/IEC 10746, OMG UML]

COMSEC: Communications security (COMSEC): Measures and controls taken to deny unauthorized persons information derived from telecommunications and to ensure the authenticity of such telecommunications. *Note:* Communications security includes cryptosecurity, transmission security, emission security, and physical security of COMSEC material. [INFOSEC]

(a) Cryptosecurity: [The] component of communications security that results from the provision of technically sound cryptosystems and their proper use. [NIS]
(b) Emission security: Protection resulting from all measures taken to deny unauthorized persons information of value which might be derived from intercept and analysis of compromising emanations from crypto-equipment, AIS, and telecommunications systems. [NIS]

(c) Physical security: The component of communications security that results from all physical measures necessary to safeguard classified equipment, material, and documents from access thereto or observation thereof by unauthorized persons. [JP 1-02]

Transmission security: [The] component of communications security that results from the application of measures designed to protect transmissions from interception and exploitation by means other than cryptanalysis. [From ANSI T1.523-2001]

Concentrator: **1.** In data transmission, a functional unit that permits a common path to handle more data sources than there are channels currently available within the path. *Note:* A concentrator usually provides communication capability between many low-speed, usually asynchronous channels and one or more high-speed, usually synchronous channels. Usually different speeds, codes, and protocols can be accommodated on the low-speed side. The low-speed channels usually operate in contention and require buffering. **2.** A device that connects a number of circuits, which are not all used at once, to a smaller group of circuits for economy. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Confidentiality: 1. Of classified or sensitive data, the degree to which the data have not been compromised; *i.e.*, have not been made available or disclosed to unauthorized individuals, processes, or other entities. [After 2382-pt.8] **2.** Assurance that information is not disclosed to unauthorized persons, processes, or devices. [INFOSEC-99] **3.** A property by which information relating to an entity or party is not made available or disclosed to unauthorized individuals, entities, or processes. [T1.Rpt22-1993] [T1 Glossary 2000: Glossary of Telecommunications Terms]

Configuration: A collection of objects able to interact at interfaces. A configuration determines the set of objects involved in each interaction. [ISO/IEC 10746, OMG UML]

Conformance: Conformance relates an implementation to a standard. Any proposition that is true in the specification must be true in its implementation. [ISO/IEC 10746, OMG UML]

Conformance point: A reference point at which behavior may be observed for the purposes of conformance testing. [ISO/IEC 10746, OMG UML]

Conformance Test: Check of data flow on communication channels in accordance with the standard conditions concerning access organization, formats and bit sequences, time synchronization, timing, signal form & level and reaction to errors. The conformance test can be carried out and certified to the standard or to
specifically described parts of the standard. The conformance test should be carried out by an ISO 9001 certified organization or system integrator. [**IEC61850-2**]

Congestion [Power]: A condition that occurs when insufficient transfer capacity is available to implement all of the preferred schedules for electricity transmission simultaneously. [**DOE Glossary of Electricity Terms]**

Congestion [Communications]: **1.** In a communications switch, a state or condition that occurs when more subscribers attempt simultaneously to access the switch than it is able to handle, even if unsaturated. **2.** In a saturated communications system, the condition that occurs when an additional demand for service occurs. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Connect Time: The amount of time you are connected to an Internet Service or Internet Service Provider (ISP). [**Common Usage**]

Connection: **1.** A provision for a signal to propagate from one point to another, such as from one circuit, line, subassembly, or component to another. **2.** An association established between functional units for conveying information. **3.** A temporary concatenation of transmission channels or telecommunication circuits, switching and other functional units set up to provide a route for a transfer of information between two or more points in a telecommunication network. [After T1.506-1989] [T1 Glossary 2000: Glossary of Telecommunications Terms] 1) In telecommunication and computing in general, a connection is the successful completion of necessary arrangements so that two or more parties (for example, people or programs) can communicate at a long distance. In this usage, the term has a strong physical (hardware) connotation although logical (software) elements are usually involved as well. 2) In computer programming, a connection is the setting up of resources (such as computer memory and buffers) so that a particular object such as a database or file can be read or written to. Typically, a programmer encodes an OPEN or similar request to the operating system that ensures that system resources such as memory are set up, encodes READs and WRITES or similar requests, and then encodes a CLOSE when a connection is no longer needed so that the resources are returned to the system for other users. [WhatIs.com]

Connectionless: **1.** In a packet-switched network, transmission in which each packet is encoded with a header containing a destination address sufficient to permit the independent delivery of the packet without the aid of additional instructions. *Note 1:* A packet transmitted in a connectionless mode is frequently called a datagram. *Note 2:* In connectionless mode transmission of a packet, the service provider usually cannot guarantee there will be no loss, error insertion, misdelivery, duplication, or out-of-sequence delivery of the packet. However, the risk of these hazards' occurring may be reduced by providing a reliable transmission service at a higher protocol layer, such as the Transport Layer of the Open Systems Interconnection--Reference Model. **2.** The transmission of a unit of data in a single self-contained operation without establishing, maintaining, and releasing a connection. [After T1.204-1992] [T1 Glossary 2000: Glossary of Telecommunications Terms]

Connector: A device for mating and demating electrical power connections or communications media. *Note:* A connector is distinguished from a splice, which is a permanent joint. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Constraint: A semantic condition or restriction. Certain constraints are predefined in the UML, others may be user defined. Constraints are one of three extensibility mechanisms in UML. See: tagged value, stereotype. [**OMG UML Spec**]

Consumer object (with respect to a communication): An object that is a sink of the information conveyed. [ISO/IEC 10746, OMG UML]

Contingency Reserve: Margin of generation for power/frequency control over forecast demand which is required in the defined period to cover against uncertainties in power station availability and against both weather forecast and demand forecast errors. NOTE – This period is usually from 24 hours ahead down to real time.
[IEC_Glossary_1929b.pdf]

Contract Price: Price of fuels marketed on a contract basis covering a period of 1 or more years. Contract prices reflect market conditions at the time the contract was negotiated and therefore remain constant throughout the life of the contract or are adjusted through escalation clauses. Generally, contract prices do not fluctuate widely. [**DOE Glossary of Electricity Terms]**

Contract: An agreement governing part of the collective behavior of a set of objects. A contract specifies obligations, permissions and prohibitions for the objects involved. [ISO/IEC 10746, OMG UML]

Contracting party (with respect to a contract): A party that agrees to that contract. [ISO/IEC 10746, OMG UML]

Contractual context: The knowledge that a particular contract is in place, and thus that a particular behavior of a set of objects is required. [ISO/IEC 10746, OMG UML]

Control Area - Power grid complete with its connected equipment for generation or collection of energy, collaborating according to the rules stipulated by separate regulations, able to offer a lasting maintenance of the specified reliability and qualitative parameters of the energy supply and to meet the conditions in effect in cooperation with the other connected power systems. [**Common Usage**]

Control Error - In power system operations, the difference between the actual controlled value and its preset level in the given moment of time. [**Common Usage**]

Controller: A controller is a computer-based entity which monitors and controls a physical device. It may contain calculation and control algorithms, and may be able to perform automatic closed-loop control. [**Common Usage**]

Cookie: A cookie is information that a Web site puts on your hard disk so that it can remember something about you at a later time. (More technically, it is information for future use that is stored by the server on the client side of a client/server communication.) Typically, a cookie records your preferences when using a particular site. Using the Web's Hypertext Transfer Protocol (HTTP), each request for a Web page is independent of all other requests. For this reason, the Web page server has no memory of what pages it has sent to a user previously or anything about your previous visits. Cookies are used primarily in three areas; shopping carts use cookies to keep track of what you are purchasing, dynamic web sites use cookies to modify the site based on your preferences, and finally, some web sites use cookies to keep track of how many times and when you have visited their site. [WhatIs.com]

Cooperative Electric Utility: An electric utility legally established to be owned by and operated for the benefit of those using its service. The utility company will generate, transmit, and/or distribute supplies of electric energy to a specified area not being serviced by another utility. Such ventures are generally exempt from Federal income tax laws. Most electric cooperatives have been initially financed by the Rural Electrification Administration, U.S. Department of Agriculture. [**DOE Glossary of Electricity Terms]**

Copyright: The legal right of ownership of published materials. Most web sites and the materials contained therein are copyrighted and should only be used with the express permission of the owner. [**Common Usage**]

CORBA Common Object Request Broker Architecture is an architecture and specification for creating, distributing, and managing distributed program objects in a network. It allows programs at different locations and developed by different vendors to communicate in a network through an "interface broker." CORBA was developed by a consortium of vendors through the Object Management Group (OMG), which currently includes over 500 member companies. Both International Organization for Standardization (ISO) and X/Open have sanctioned CORBA as the standard architecture for distributed objects (which are also known as components). CORBA 3 is the latest level. The essential concept in CORBA is the Object Request Broker (ORB). ORB support in a network of clients and servers on different computers means that a client program (which may itself be an object) can request services from a server program or object without having to understand where the server is in a distributed network or what the interface to the server program looks like. To make requests or return replies between the ORBs, programs use the General Inter-ORB Protocol (GIOP) and, for the Internet, its Internet Inter-ORB Protocol (IIOP). IIOP maps GIOP requests and replies to the Internet's Transmission Control Protocol (TCP) layer in each computer. [WhatIs.com]

Cost-of-Service Regulation: Traditional electric utility regulation under which a utility is allowed to set rates based on the cost of providing service to customers and the right to earn a limited profit. [**DOE Glossary of Electricity Terms]**

Cracker: Criminal hacker. [**Common Usage**]

Crash and Burn: A spectacular computer crash, named after the suitably tragic car crashes at the end of a lot of bad movies. [**Common Usage**]

Crawler (see spider) [**Common Usage**]

CRC (Cyclic Redundancy Check): **1.** An error-detection scheme that (a) uses parity bits generated by polynomial encoding of digital signals, (b) appends those parity bits to the digital signal, and (c) uses decoding algorithms that detect errors in the received digital signal. *Note:* Error correction, if required, may be accomplished through the use of an automatic repeat-request (ARQ) system. **2.** [An] error checking mechanism that checks data integrity by computing a polynomial algorithm based checksum. [INFOSEC-99] [T1 Glossary 2000: Glossary of Telecommunications Terms]

Creation (of an <X>): Instantiating an <X>, when it is achieved by an action of objects in the model. <X> can be anything that can be instantiated, in particular objects and interfaces. [ISO/IEC 10746, OMG UML]

Cryptography: **1.** [The] art or science concerning the principles, means, and methods for rendering plain information unintelligible, and for restoring encrypted information to intelligible form. [INFOSEC-99] **2.** The branch of cryptology that treats of the principles, means, and methods of designing and using cryptosystems. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Cryptographic Hash: A mathematical function that maps values from a large (or even very large) domain into a smaller range, and is (a) one-way in that it is computationally infeasible to find any input which maps to any pre-specified output; and (b) collision-free in that it is computationally infeasible to find any two distinct inputs which map to the same output. [After X9.31] [T1 Glossary 2000: Glossary of Telecommunications Terms]

CSMA: Carrier Sense Multiple Access

CSMA/CA: Carrier Sense Multiple Access/Collision Avoidance

CSMA/CD: Carrier Sense Multiple Access/Collision Detection

CSS (Cascading Style Sheets): CSS is a style sheet language that allows authors and users to attach style (e.g., fonts, spacing, and aural cues) to structured documents (e.g., HTML documents and XML applications). By separating the presentation style of documents from the content of documents, CSS simplifies Web authoring and site maintenance. [W3C]

CSU (Channel Service Unit): A line bridging device that (a) is used to perform loop-back testing, (b) may perform bit stuffing, (c) may also provide a framing and formatting pattern compatible with the network, and (d) is the last signal regeneration point, on the loop side, coming from the central office, before the regenerated signal reaches a

multiplexer or data terminal equipment (DTE). [T1 Glossary 2000: Glossary of Telecommunications Terms]

csv: (comma separated value). An ASCII file of values separated by commas. The commas act as delimiters between values. However, other delimiters could also be used. Usually used when importing or exporting data between applications where a common intelligent format is not available.

Current (Electric): A flow of electrons in an electrical conductor. The strength or rate of movement of the electricity is measured in amperes. [**DOE Glossary of Electricity Terms]**

Customer: Each entity that receives or collects energy according to the agreement signed with the electric utility. [**Common Usage**]

Customer Choice: Allowing all customers to purchase kilowatthours of electricity from any of a number of companies that compete with each other. [**DOE Glossary of Electricity Terms]**

Customer Information System (CIS): A utility Customer Services system and database, containing the basic customer information, including name, address, telephone, electric service specifics, and billing information on all utility customers. Some CIS systems also contain linkages of the customer site to the power system through a transformer database. See CIS. [**Common Usage**]

Cyber: "Cyber" is a prefix used to describe a person, thing, or idea as part of the computer and information age. Taken from *kybernetes*, Greek for "steersman" or "governor," it was first used in cybernetics, a word coined by Norbert Wiener and his colleagues. Common usages include cyberculture, cyberpunk, and cyberspace. [WhatIs.com]

Cyberspace: Cyberspace is the total interconnectedness of human beings through computers and telecommunication without regard to physical geography.
William Gibson is sometimes credited with inventing or popularizing the term by using it in his novel of 1984, Neuromancer. [WhatIs.com]
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D

D Channel: the Integrated Services Digital Network (ISDN), the D-channel is the channel that carries control and signalling information. (The "D" stands for "delta" channel.) The B-channel ("B" for "bearer") carries the main data. In ISDN, there are two levels of service: the Basic Rate Interface, intended for the home and small enterprise, and the Primary Rate Interface, for larger users. Both rates include a number of B- (bearer) channels and a D- (delta) channel. The B-channels carry data, voice, and other services. The D-channel carries control and signaling information. The Basic Rate Interface consists of two 64 Kbps B-channels and one 16 Kbps D-channel. Thus, a Basic Rate Interface user can have up to 128 Kbps service. The Primary Rate Interface consists of 23 B-channels and one 64- Kpbs D channel in the United States or 30 B-channels and 1 D-channel in Europe. [WhatIs.com]

DAC (Data Acquisition and Control): which is a front end to a SCADA system dedicated to managing the communication protocols from RTUs and IEDs. The DAC also handles the monitoring of the remote data and passes the control commands from the SCADA to the end devices. [**Common Usage**]

DAF (Data Access Facility): DAF is an API developed for the OMG group to access model data needed for simulation and analysis applications from a utility SCADA, EMS, or DMS system on a read-only basis. [OMG]

DAIS (Data Acquisition from Industrial Systems): DAIS is an API developed for the OMG group to support efficient real time transfer of large amounts of data from an real-time process to a wide range of clients, to permit the discovery of parameters, and to allow the update of parameter values. [OMG]

DAIS™: Data Access Integration Services

DAMA (Demand Assigned Multiple Access): In a communications system, a technique for allocating use of bandwidth among multiple users, based on demand. *Note:* DAMA can be implemented in many ways including TDM and FDM. In particular, some of the more sophisticated satellite systems and digital cellular phone systems use DAMA. [T1 Glossary 2000: Glossary of Telecommunications Terms]

DARPA (U.S. Defense Advanced Research Project Agency): DARPA is the central research and development organization for the Department of Defense (DoD). It manages and directs selected basic and applied research and development projects for DoD. DARPA developed a computer network called ARPAnet. [http://www.arpa.mil].

Data Attribute: defines the name (semantic), format, range of possible values, and representation of values while being communicated. [**IEC61850-2**]

Data Circuit-terminating Equipment (DCE): *Abbreviation for* **data circuit-terminating equipment. 1.** In a data station, the equipment that (a) performs functions, such as signal conversion and coding, at the network end of the line between the data terminal equipment (DTE) and the line, and (b) may be a separate or an integral part of the DTE or of intermediate equipment. **2.** The interfacing equipment that may be required to couple the data terminal equipment (DTE) into a transmission circuit or channel and from a transmission circuit or channel into the DTE. *Synonyms* **data communications equipment** *(deprecated)* **, data set** *(deprecated).* **3.** *Abbreviation for* **distributed computing environment.** An architecture of standard programming interfaces, conventions, and server functionalities (*e.g.*, naming, distributed file system, remote procedure call) for distributing applications transparently across networks of heterogeneous computers. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Data Confidentiality: See Confidentiality

Data Encryption Standard (DES): [A] cryptographic algorithm for the protection of unclassified computer data and published by the National Institute of Standards and Technology (NIST) in Federal Information Processing Standard (FIPS) Publication 46-1. [INFOSEC-99] *Note:* DES is **not** approved for protection of national security classified information. [T1 Glossary 2000: Glossary of Telecommunications Terms] DES is a widely-used method of data encryption using a private (secret) key that was judged so difficult to break by the U.S. government that it was restricted for exportation to other countries. There are 72,000,000,000,000,000 (72 quadrillion) or more possible encryption keys that can be used. For each given message, the key is chosen at random from among this enormous number of keys. Like other private key cryptographic methods, both the sender and the receiver must know and use the same private key. DES applies a 56-bit key to each 64-bit block of data. The process can run in several modes and involves 16 rounds or operations. Although this is considered "strong" encryption, many companies use "triple DES", which applies three keys in succession. This is not to say that a DES-encrypted message cannot be "broken." Early in 1997, Rivest-Shamir-Adleman (RSA), owners of another encryption approach, offered a $10,000 reward for breaking a DES message. A cooperative effort on the Internet of over 14,000 computer users trying out various keys finally deciphered the message, discovering the key after running through only 18 quadrillion of the 72 quadrillion possible keys! Few messages sent today with DES encryption are likely to be subject to this kind of code-breaking effort. [WhatIs.com] Alternatives to basic DES are 3DES (DES applied three times) and AES.

Data Integrity: **1.** [The] condition existing when data is unchanged from its source and has not been accidentally or maliciously modified, altered, or destroyed. [INFOSEC-99] **2.** The condition in which data are identically maintained during any operation, such as transfer, storage, and retrieval. **3.** The preservation of data for their intended use. **4.** Relative to specified operations, the *a priori* expectation of data quality. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Data link: **1.** The means of connecting one location to another for the purpose of transmitting and receiving data. [JP 1-02] **2.** An assembly, consisting of parts of two data

terminal equipments (DTEs) and the interconnecting data circuit, that is controlled by a link protocol enabling data to be transferred from a data source to a data sink. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Data Link Layer: Layer 2. This layer responds to service requests from the Network Layer and issues service requests to the Physical Layer. The Data Link Layer provides the functional and procedural means to transfer data between network entities and to detect and possibly correct errors that may occur in the Physical Layer. *Note:* Examples of data link protocols are HDLC and ADCCP for point-to-point or packet-switched networks and LLC for local area networks. See OSI Reference Model. [T1 Glossary 2000: Glossary of Telecommunications Terms]

Data Modeling: Data modeling is the analysis of data objects that are used in a business or other context and the identification of the relationships among these data objects. Data modeling is a first step in doing object-oriented programming. As a result of data modeling, you can then define the classes that provide the templates for program objects. A simple approach to creating a data model that allows you to visualize the model is to draw a square (or any other symbol) to represent each individual data item that you know about (for example, a product or a product price) and then to express relationships between each of these data items with words such as "is part of" or "is used by" or "uses" and so forth. From such a total description, you can create a set of classes and subclasses that define all the general relationships. These then become the templates for objects that, when executed as a program, handle the variables of new transactions and other activities in a way that effectively represents the real world. Several differing approaches or methodologies to data modeling and its notation have recently been combined into the Unified Modeling Language (UML), which is the de facto standard modeling language used by most industries. [WhatIs.com]

Data Object: part of a logical node object representing specific information e.g. status or measurement. From an object-oriented point of view a data object is an instance of a data class. [**IEC61850-2**] A Data Object is an abstract element of a real device that is capable of providing (when read) or accepting (when written) or both, a typed data value. A Data Object may represent a single data element (i.e., one measurement point) or a data structure (i.e., a complex set of data elements). The mapping of a Data Object to a real, physical entity in the device is defined by the model of the device being represented, and is outside the scope of this document. Data Objects are usually combined into functional Bricks, which are then used to construct a Device. Each Data Object has an associated Class, which defines its syntax. If the referenced Class contains common components, then the generic semantics from the common component is used by the Data Object to define specific semantics (e.g. the quality code common component will be used to define the quality of the value of the Data Object). [**Common Usage**]

Data Type: A Data Type is a basic computer format (syntax) for data, e.g. Integer (INT16), Floating point (FLT64), Boolean (BOOL), Bitstrings (BSTRn), Visible Strings which are readable characters (VSTR32), etc. [**Common Usage**]

Database: A computer holding large amounts of information that can be searched by an Internet user. [**Common Usage**]

Datagram: In packet switching, a self-contained packet, independent of other packets, that contains information sufficient for routing from the originating data terminal equipment (DTE) to the destination DTE without relying on prior exchanges between the equipment and the network. *Note:* Unlike virtual call service, when datagrams are sent there are no call establishment or clearing procedures. Thus, the network may not be able to provide protection against loss, duplication, or misdelivery. [T1 Glossary 2000: Glossary of Telecommunications Terms] A self-contained, independent entity of data carrying sufficient information to be routed from the source to the destination computer without reliance on earlier exchanges between this source and destination computer and the transporting network. Defined in the OSI Reference Model as the data unit for the Transport layer. See also packet. [WhatIs.com]

DataSet: A DataSet is a ordered list of references to Data Objects associated with a specific DataSet Name, and is a means of grouping data together that is frequently accessed as a group. DataSets are used in ICCP and IEC 61850 to minimize the overhead for determining what data should be sent periodically. In IEC 61850, DataSets are used by the Report Control Blocks to determine what data to report periodically or upon exception. For instance, a DataSet could be defined as all status points in a particular Logical Unit; this DataSet would be associated with a Report Control Block which would report any status changes by exception, whenever they occur. [**IEC61850**]

Day-Ahead Market: The forward market for energy and ancillary services to be supplied during the settlement period of a particular trading day that is conducted by the Independent System Operator, the power exchange, and other Scheduling Coordinators. This market closes with the Independent System Operator's acceptance of the final day-ahead schedule. [**DOE Glossary of Electricity Terms]**

Day-Ahead Schedule: A schedule prepared by a Scheduling Coordinator or the Independent System Operator before the beginning of a trading day. This schedule indicates the levels of generation and demand scheduled for each settlement period that trading day. [**DOE Glossary of Electricity Terms]**

DB-9: DB-xx is the designation for a series of port connectors for attaching devices to computers. DB-xx connectors include DB-9, DB-15, DB-25, DB-50, and DB-68. DB-9 is a connector used for RS-232 connections and for several video interfaces on IBM-compatible computers. [WhatIs.com]

DB-15: DB-xx is the designation for a series of port connectors for attaching devices to computers. DB-xx connectors include DB-9, DB-15, DB-25, DB-50, and DB-68. DB-15 is a female connector used as a joystick port on IBM-compatible computers and as the video connector on Macintosh computers. There is also a high-density DB-15 female connector for the Video Graphics Array (VGA) or Super Video Graphics Array (SVGA) video adapter on IBM-compatible computers. [WhatIs.com]

DB-25: DB-25 is a male connector used for attaching external modems and RS-232 serial peripherals on older IBM-compatible computers. The DB-25 female connector is the parallel port connector for most personal computers, typically used for parallel interface printers. DB-25 was first used with the original IBM personal computer (PC) and has had a long life. [WhatIs.com]

DB-50: DB-50 is a female connector used as the SCSI-2 connector for 8-bit Narrow SCSI devices on older Sun and Data General computers. However, DB-50 is not recognized by the SCSI specifications. [WhatIs.com]

DB-68: DB-68 is a high-density connector used as a SCSI-3 connector for 16-bit Wide SCSI and Fast SCSI devices. [WhatIs.com]

DBMS: A database management system (DBMS), sometimes just called a *database manager*, is a program that lets one or more computer users create and access data in a database. The DBMS manages user requests (and requests from other programs) so that users and other programs are free from having to understand where the data is physically located on storage media and, in a multi-user system, who else may also be accessing the data. In handling user requests, the DBMS ensures the *integrity* of the data (that is, making sure it continues to be accessible and is consistently organized as intended) and *security* (making sure only those with access privileges can access the data). The most typical DBMS is a relational database management system (RDBMS). A standard user and program interface is the Structured Query Language (SQL). A newer kind of DBMS is the object-oriented database management system (ODBMS). [WhatIs.com]

DCE: See Data Circuit-terminating Equipment

DCE: See Distributed Computing Environment

DCOM (Distributed Component Object Model): is a Microsoft developed protocol that enables software components to communicate directly over a network in a reliable, secure, and efficient manner. Previously called "Network OLE," DCOM is designed for use across multiple network transports, including Internet protocols such as HTTP. DCOM is based on the Open Software Foundation's DCE-RPC spec and will work with both Java applets and ActiveX® components through its use of the COM. [Microsoft]

DCS (Distributed Control System): DCS's are used in power plants and other energy production facilities as the primary control system and data highway. [**Common Usage**]

DDN (Defense Data Network): A portion of the Internet, which connects to U.S. Military Bases and contractors; used for non-secure communications. MILNET is one of the DDN networks. It also runs "the NIC," where a lot of Internet information is archived.

Deadband: A deadband is the amount by which an analog input must change from the last reported value to be spontaneously reported. [**Common Usage**]

Deactivation: Check-pointing a cluster, followed by deletion of the cluster. [ISO/IEC 10746, OMG UML]

Declaration: An action that establishes a state of affairs in the environment of the object making the declaration. [ISO/IEC 10746, OMG UML]

Decomposition (of a behavior): The specification of a given behavior as a composition. [ISO/IEC 10746, OMG UML]

Decomposition (of an object): The specification of a given object as a composition. [ISO/IEC 10746, OMG UML]

Delegation: The action that assigns authority, responsibility or a function to another object. [ISO/IEC 10746, OMG UML]

Deletion (of an <X>): The action of destroying an instantiated <X>. <X> can be anything that can be instantiated, in particular objects and interfaces. [ISO/IEC 10746, OMG UML]

Demand: The rate at which energy is delivered to loads and scheduling points by generation, transmission, and distribution facilities. [**DOE Glossary of Electricity Terms]**

Demand (Electric): The rate at which electric energy is delivered to or by a system, part of a system, or piece of equipment, at a given instant or averaged over any designated period of time. [**DOE Glossary of Electricity Terms]**

Demand Bid: A bid into the power exchange indicating a quantity of energy or an ancillary service that an eligible customer is willing to purchase and, if relevant, the maximum price that the customer is willing to pay. [**DOE Glossary of Electricity Terms]**

Demand-Side Management: The planning, implementation, and monitoring of utility activities designed to encourage consumers to modify patterns of electricity usage, including the timing and level of electricity demand. It refers only to energy and load-shape modifying activities that are undertaken in response to utility-administered programs. It does not refer to energy and load-shape changes arising from the normal operation of the marketplace or from government-mandated energy-efficiency standards. Demand-Side Management (DSM) covers the complete range of load-shape objectives, including strategic conservation and load management, as well as strategic load growth. [**DOE Glossary of Electricity Terms]**

Denial of Service Attack: **1.** The prevention of authorized access to resources or the delaying of time-critical operations. [2382-pt.8] **2.** The result of any action or series of actions that prevents any part of an information system (IS) from functioning. [INFOSEC-99] [T1 Glossary 2000: Glossary of Telecommunications Terms] the

Internet, a denial of service (DoS) attack is an incident in which a user or organization is deprived of the services of a resource they would normally expect to have. Typically, the loss of service is the inability of a particular network service, such as e-mail, to be available or the temporary loss of all network connectivity and services. In the worst cases, for example, a Web site accessed by millions of people can occasionally be forced to temporarily cease operation. A denial of service attack can also destroy programming and files in a computer system. Although usually intentional and malicious, a denial of service attack can sometimes happen accidentally. A denial of service attack is a type of security breach to a computer system that does not usually result in the theft of information or other security loss. However, these attacks can cost the target person or company a great deal of time and money. Common forms of denial of service attacks are:

- **Buffer Overflow Attacks**: The most common kind of DoS attack is simply to send more traffic to a network address than the programmers who planned its data buffers anticipated someone might send. The attacker may be aware that the target system has a weakness that can be exploited or the attacker may simply try the attack in case it might work. A few of the better-known attacks based on the buffer characteristics of a program or system include:
  Sending e-mail messages that have attachments with 256-character file names to Netscape and Microsoft mail programs
  Sending oversized Internet Control Message Protocol (ICMP) packets (this is also known as the Packet Internet or Inter-Network Groper (ping) of death)
  Sending to a user of the Pine e-mail program a message with a "From" address larger than 256 characters
- **SYN Attack**: When a session is initiated between the Transport Control Program (TCP) client and server in a network, a very small buffer space exists to handle the usually rapid "hand-shaking" exchange of messages that sets up the session. The session-establishing packets include a SYN field that identifies the sequence in the message exchange. An attacker can send a number of connection requests very rapidly and then fail to respond to the reply. This leaves the first packet in the buffer so that other, legitimate connection requests can't be accommodated. Although the packet in the buffer is dropped after a certain period of time without a reply, the effect of many of these bogus connection requests is to make it difficult for legitimate requests for a session to get established. In general, this problem depends on the operating system providing correct settings or allowing the network administrator to tune the size of the buffer and the timeout period.
- **Teardrop Attack**: This type of denial of service attack exploits the way that the Internet Protocol (IP) requires a packet that is too large for the next router to handle be divided into fragments. The fragment packet identifies an offset to the beginning of the first packet that enables the entire packet to be reassembled by the receiving system. In the teardrop attack, the attacker's IP puts a confusing offset value in the second or later fragment. If the receiving operating system does not have a plan for this situation, it can cause the system to crash.
- **Smurf Attack**: In this attack, the perpetrator sends an IP ping (or "echo my message back to me") request to a receiving site. The ping packet specifies that it be broadcast to a number of hosts within the receiving site's local network. The

packet also indicates that the request is from another site, the target site that is to receive the denial of service. (Sending a packet with someone else's return address in it is called spoofing the return address.) The result will be lots of ping replies flooding back to the innocent, spoofed host. If the flood is great enough, the spoofed host will no longer be able to receive or distinguish real traffic.

- **Viruses**: Computer viruses, which replicate across a network in various ways, can be viewed as denial-of-service attacks where the victim is not usually specifically targeted but simply a host unlucky enough to get the virus. Depending on the particular virus, the denial of service can be hardly noticeable ranging all the way through disastrous.
- **Physical Infrastructure Attacks**: Here, someone may simply snip a fiber optic cable. This kind of attack is usually mitigated by the fact that traffic can sometimes quickly be rerouted.

[WhatIs.com]

DER (Distributed Energy Resources) - Distributed Energy Resources [**Common Usage**]

Deregulation: The elimination of regulation from a previously regulated industry or sector of an industry. [**DOE Glossary of Electricity Terms]**

Derived class/ Base class: If a template A is an incremental modification of a template B, then the template class CA of instances of A is a derived class of the template class CB of instances of B, and the CB is a base class of CA. [ISO/IEC 10746, OMG UML]

DES: see Data Encryption Standard.

Device - A device is a physical entity connected to the communication network composed of at least one communication element (the network element), which may have a control element and/or a monitoring element. [**Common Usage**]

Device Identity: The Device Identity, DI, contains the nameplate information of a device such as make, model, and serial number. [**Common Usage**]

Device Model: A Device Model is an aggregation of Data Objects that together represent the communications visible functionality of a real device. [**IEC61850**]

Device: 1) In general, a device is a machine designed for a purpose. In a general context, a computer can be considered a device. 2) In the context of computer technology, a device is a unit of hardware, outside or inside the case or housing for the essential computer (processor, memory, and data paths) that is capable of providing input to the essential computer or of receiving output or of both. [WhatIs.com] A device is a physical entity connected to the communication network composed of at least one communication element (the network element), which may have a control element and/or a monitoring element. [**Common Usage**]

DEWG: Data Exchange Working Group

DHCP (Dynamic Host Configuration Protocol): An TCP/IP protocol extension to BOOTP that dynamically allocates configuration information. Defined in RFC2131. See UDP/IP. See also RFC1534, RFC2132, RFC2241, RFC2485, RFC2563, RFC2610, RFC2855, RFC2937, RFC2939, RFC3004, RFC3011, RFC3046, RFC3118.

DHTML: See Dynamic HTML (DHTML)

Dial-Up Connection: This is a standard way of connecting to the Internet temporarily. Using a modem and special dial-in software, the computer establishes a connection with a remote server which itself is permanently connected to the Net. [**Common Usage**]

Dialup line, dial-in line, dial line: A temporary data connection activated by establishing a direct-dialed telephone link between two communication devices. Compare with leased line. [**Common Usage**]

Digital Certificate: See Certificate

Digital Signature: **1.** A cryptographic modification of data that provides: (a) origin authentication, (b) data integrity, and (c) signer nonrepudiation (when associated with a data unit and accompanied by the corresponding public-key certificate). [After X9.49] **2.** [A] cryptographic process used to assure message originator authenticity, integrity, and nonrepudiation. *Synonym* **electronic signature.** [INFOSEC-99] [T1 Glossary 2000: Glossary of Telecommunications Terms] A digital code attached to an e-mail or other form of communication that assures the recipient of the authenticity of the sender. [**Common Usage**]

Direct Access: The ability of a retail customer to purchase commodity electricity directly from the wholesale market rather than through a local distribution utility. [**DOE Glossary of Electricity Terms]**

Directory: A directory is, in general, an approach to organizing information, the most familiar example being a telephone directory. 1) On the World Wide Web, a directory is a subject guide, typically organized by major topics and subtopics. The best-known directory is the one at Yahoo (http://www.yahoo.com). Many other sites now use a Yahoo-like directory including major portal sites. 2) In computer file systems, a directory is a named group of related files that are separated by the naming convention from other groups of files. 3) In computer networks, a directory is a collection of users, user passwords, and, usually, information about what network resources they can access. [WhatIs.com]

Directory Service: A service on a network that uses a Directory to give information about sites, computers, resources, or users in the area. [**Common Usage**]

Disassembling: Converting a binary program into human-readable machine language. [**Common Usage**]

DisCo: Distribution Company [**Common Usage**]

Dispatch Order - Order issued by the dispatcher, concerning performance of the specific operations in the given electric facility. [**Common Usage**]

Distributed: Computing is said to be "distributed" when the computer programming and data that computers work on are spread out over more than one computer, usually over a network. Computing prior to low-cost computer power on the desktop, was organized in centralized "glass houses" (so-called because the computers were often shown to visitors through picture windows). Although these centers still exist, large and small enterprises over time are moving (distributing) applications and data to where they can operate most efficiently in the enterprise, to some mix of desktop workstations, local area network servers, regional servers, Web servers, and other servers. A popular trend has been client/server computing which is simply the view that a client computer can provide certain capabilities for a user and request others from other computers that provide services for the clients. [WhatIs.com]

Distributed Computing: In general, distributed computing is any computing that involves multiple computers remote from each other that each have a role in a computation problem or information processing. 1) In business enterprises, distributed computing generally has meant putting various steps in business processes at the most efficient places in a network of computers. In the typical transaction using the 3-tier model, user interface processing is done in the PC at the user's location, business processing is done in a remote computer, and database access and processing is done in another computer that provides centralized access for many business processes. Typically, this kind of distributed computing uses the client/server communications model. [WhatIs.com]

Distributed Computing Environment (DCE): In network computing, DCE (Distributed Computing Environment) is an industry-standard software technology for setting up and managing computing and data exchange in a system of distributed computers. DCE is typically used in a larger network of computing systems that include different size servers scattered geographically. DCE uses the client/server model. Using DCE, application users can use applications and data at remote servers. Application programmers need not be aware of where their programs will run or where the data will be located. [WhatIs.com]

Distributed Denial-of-Service (DDoS) Attack: On the Internet, a distributed denial-of-service (DDoS) attack is one in which a multitude of compromised systems attack a single target, thereby causing denial of service for users of the targeted system. The flood of incoming messages to the target system essentially forces it to shut down, thereby denying service to the system to legitimate users. [WhatIs.com]

Distributed Generation (DG): Electric generation facilities connected to an Area Electric Power System (EPS) through a Point of Common Coupling (PCC); DG is a subset of DR. [**IEEE P1547 Standard for Interconnecting Distributed Resources with Electric Power Systems**]

Distributed Resources (DR) or Distributed Energy Resources (DER): Sources of electric power that are not directly connected to a bulk power transmission system. DR includes both generators and energy storage technologies. [**IEEE P1547 Standard for Interconnecting Distributed Resources with Electric Power Systems**]

Distribution: The delivery of electricity to retail customers (including homes, businesses, etc.). [**DOE Glossary of Electricity Terms]**

Distribution System: The portion of an electric system that is dedicated to delivering electric energy to an end user. [**DOE Glossary of Electricity Terms]**

Distribution System Operator - Electric utility that holds license for transmission and distribution of energy, using the distribution network, in a part of the country that is identified in the license. [**Common Usage**]

Distribution transparency: The property of hiding from a particular user the potential behavior of some parts of a distributed system. [ISO/IEC 10746, OMG UML]

Divestiture: The stripping off of one utility function from the others by selling (spinning-off) or in some other way changing the ownership of the assets related to that function. Stripping off is most commonly associated with spinning-off generation assets so they are no longer owned by the shareholders that own the transmission and distribution assets. [**DOE Glossary of Electricity Terms]**

Dividing action: An action which enables two or more chains. [ISO/IEC 10746, OMG UML]

DMS (Distribution Management System): used for managing the distribution assets and operations. DMS applications can include or not include many functions. [**Common Usage**]

DMTF (Distributed Management Task Force): The DMTF is the industry organization that is leading the development, adoption and unification of management standards and initiatives for desktop, enterprise and Internet environments. http://www.dmtf.org

DMZ (DeMilitarized Zone): In computer networks, a DMZ (demilitarized zone) is a computer host or small network inserted as a "neutral zone" between a company's private network and the outside public network. It prevents outside users from getting direct access to a server that has company data. (The term comes from the geographic buffer zone that was set up between North Korea and South Korea following the UN "police

action" in the early 1950s.) A DMZ is an optional and more secure approach to a firewall and effectively acts as a proxy server as well. [WhatIs.com]

DNP (Distributed Network Protocol): an RTU protocol based on the IEC 870-5 protocol standard, but modified for the North American market. See DNP Primer. [DNP Users Group]

DNS (Domain Name System): is a distributed database used by TCP/IP applications to map between domain names and IP addresses, and to provide electronic mail routing information. Defined in RFC1034 and RFC1035. See also IANA and ICANN. The domain name system (DNS) is the way that Internet domain names are located and translated into Internet Protocol addresses. A domain name is a meaningful and easy-to-remember "handle" for an Internet address. Because maintaining a central list of domain name/IP address correspondences would be impractical, the lists of domain names and IP addresses are distributed throughout the Internet in a hierarchy of authority. There is probably a DNS server within close geographic proximity to your access provider that maps the domain names in your Internet requests or forwards them to other servers in the Internet. [WhatIs.com]

DNS Spoofing: Assuming the DNS name of another system by either corrupting the name service cache of a victim system, or by compromising a domain name server for a valid domain.

DoD: The U.S. Department of Defense who's Advanced Research Projects Agency got the Internet started by creating the ARPAnet. [DoD]

DOM (Document Object Model): The Document Object Model (DOM) was developed by the W3C, and is a platform- and language-neutral interface that will allow programs and scripts to dynamically access and update the content, structure and style of documents. W3C's DOM is a standard API to the document structure and aims to make it easy for programmers to access components and delete, add or edit their content, attributes and style. Hence, there are a number of domains DOM covers; e.g., DOM XML, DOM HTML (DOM Level 0), DOM Events, and DOM CSS. The document can be further processed and the results of that processing can be incorporated back into the presented page. This is an overview of DOM-related materials here at W3C and around the web. [W3C Document Object Model]

Domain: An area of knowledge or activity characterized by a set of concepts and terminology understood by practitioners in that area. [**OMG UML]** In general, a domain is an area of control or a sphere of knowledge. In computing and telecommunication in general, a domain is a sphere of knowledge identified by a name. Typically, the knowledge is a collection of facts about some program entities or a number of network points or addresses. On the Internet, a domain consists of a set of network addresses. This domain is organized in levels. The top level identifies geographic or purpose commonality (for example, the nation that the domain covers or a category such as "commercial"). The second level identifies a unique place within the top level domain

and is, in fact, equivalent to a unique address on the Internet (an IP address). Lower levels of domain may also be used. [WhatIs.com]

Domain Name: A unique name that identifies each computer on the Internet and is used in lieu of an IP address. Domain names are managed by IANA (Internet Assigned Numbers Authority) and ICANN (Internet Corporation for Assigned Names and Numbers).

Domain Type	Description
.com	Commercial business, organization, or company
.edu	Educational institution
.gov	Nonmilitary government entity
.int	International organization
.mil	Military organization
.net	Network administration, often Internet-related
.org	Other organizations: nonprofit, nonacademic
.uk, .au, ca, jp, se, etc.	Country codes denoting servers found in other countries. Complete country listing.

Domain Name System: See DNS.

Domain Type: Domain: A realm of control. On the Internet, there are several levels of domains each being a unique name for the collection of computers connected together in a unified network or networks. The top level domains consists of the two letter International country code such as .us, .ca (Canada), .au (Australia). Since the Internet was originated in the US, the 6 primary domains are not at this time required to indicate they belong in the US domain. The main domains in the US are .com, .org, .net, .edu, .gov, .mil. In each of those domains, there is another level of domains, normally controlled by a single organization. [WhatIs.com]

<X> Domain: A set of objects, each of which is related by a characterizing relationship <X> to a controlling object. [ISO/IEC 10746, OMG UML]

DoS: see Denial of Service

Dot Address: A dot address (sometimes known as a dotted quad address) refers to the notation that expresses the four-byte (32-bit) IP address as a sequence of four decimal numbers separated by dots. Each number represents the binary value of one of four bytes. Look at this Internet address, for example: 205.245.172.72. Tip:To find out the dot address (such as 205.245.172.72) for a given domain name, Windows users can go to their MS DOS prompt screen and enter: ping xxx.yyy where xxx is the second-level domain name like "whatis" and yyy is the top-level domain name like "com"). [WhatIs.com]

Double-Circuit Line: two three-phase circuits for electric power transmission constructed on a single structure. (NERC "*Terms and Their Definitions As Used in the NERC Planning Standards*")

Download: To transfer a copy of a file residing on a remote computer to a user's computer. [T1 Glossary 2000: Glossary of Telecommunications Terms] Downloading is the transmission of a file from one computer system to another, usually smaller computer system. From the Internet user's point-of-view, to download a file is to request it from another computer (or from a Web page on another computer) and to receive it. [WhatIs.com] The opposite is to upload.

DR (Distributed Resources): See Distributed Resources.

Driver: Software for using a peripheral hardware device attached to a computer.

Droop of Generating Unit Control: [603-04-08] Ratio of the per-unit change in frequency to the per-unit change in power. [IEC_Glossary_1929b.pdf]

DS-0: In T-carrier, a basic digital signaling rate of 64 kb/s, corresponding to the capacity of one voice-frequency-equivalent channel. *Note 1:* The DS0 rate forms the basis for the North American digital multiplex transmission hierarchy. *Note 2:* The DS0 rate may support twenty 2.4-kb/s channels, or ten 4.8-kb/s channels, or five 9.67-kb/s channels, or one 56-kb/s channel, or one 64-kb/s clear channel. [T1 Glossary 2000: Glossary of Telecommunications Terms]

DS-1: Digital Signal (DS) Service, level 1. Provides a digital signaling rate of 1.544 Mbps, which is implemented using a T-1 line. [T1 Glossary 2000: Glossary of Telecommunications Terms]

DS-2: Digital Signal (DS) Service, level 2. Provides a digital signaling rate of 6.312 Mbps which is implemented using a T-2 line. [T1 Glossary 2000: Glossary of Telecommunications Terms]

DS-3: Digital Signal (DS) Service, level 3. Provides a digital signaling rate of 44.736 Mbps which is implemented using a T-3 line. [T1 Glossary 2000: Glossary of Telecommunications Terms]

DS-4: Digital Signal (DS) Service, level 4. Provides a digital signaling rate of 274.176 Mbps which is implemented using a T-4 line. [T1 Glossary 2000: Glossary of Telecommunications Terms]

DSL, see xDSL.

DSM (Demand Side Management) - Customer measures to reduce or shift load. These measures can be performed voluntarily by the customer or could be performed by the distribution company in accordance with the customer's tariff. For residential customers, DSM can include cycling water heaters, air conditioners, and pool pumps. For commercial and industrial customers, DSM can involve the turning off of specific machinery or other energy saving steps. Typical reasons for DSM are peak shaving, emergency situations, and market prices. [**Common Usage**]

DTD (Document Type Definition): A Document Type Definition (DTD) is a specific document defining and constraining definition or set of statements that follow the rules of the Standard Generalized Markup Language (SGML) or of the Extensible Markup Language (XML), a subset of SGML. A DTD is a specification that accompanies a document and identifies what the funny little codes (or markup) are that, in the case of a text document, separate paragraphs, identify topic headings, and so forth and how each is to be processed. By mailing a DTD with a document, any location that has a DTD "reader" (or "SGML compiler") will be able to process the document and display or print it as intended. This means that a single standard SGML compiler can serve many different kinds of documents that use a range of different markup codes and related meanings. The compiler looks at the DTD and then prints or displays the document accordingly. [WhatIs.com]

DTE (Data Terminal Equipment): In computer data transmission, DTE (Data Terminal Equipment) is the RS-232C interface that a computer uses to exchange data with a modem or other serial device. For further information about the DTE interface and its relationship to the Data Communication Equipment (DCE) interface, see RS-232C. [WhatIs.com]

Duplex: see Full Duplex Mode

DXF (Drawing Exchange Format) or (Data Exchange File): A two-dimensional graphics file format supported by virtually all PC -based CAD products. It was created by Autodesk for the AutoCAD system. [Webopedia]

Dynamic HTML (DHTML): Dynamic HTML is a collective term for a combination of new Hypertext Markup Language (HTML) tags and options, that will let you create Web pages more animated and more responsive to user interaction than previous versions of HTML. Much of dynamic HTML is specified in HTML 4.0. Simple examples of dynamic HTML pages would include (1) having the color of a text heading change when a user passes a mouse over it or (2) allowing a user to "drag and drop" an image to

another place on a Web page. Dynamic HTML can allow Web documents to look and act like desktop applications or multimedia productions. [WhatIs.com]

Dynamic Instability (of a power system): Lack of damping which results in a build-up of oscillations in the power system, and may or may not lead to loss of synchronism. NOTE – Under this condition the derivative of active power with respect to rotor speed is negative for at least one generator. [IEC_Glossary_1929b.pdf]

Dynamic schema: A specification of the allowable state changes of one or more information objects, subject to the constraints of any invariant schemata. [ISO/IEC 10746, OMG UML]

E

E Lines, European equivalent of North American T-lines.

EAI (Enterprise Application Integration): The integration of enterprise applications using Middleware.

Eavesdropping: Eavesdropping is a security term in which an attacker gains access to information that he has no right to acquire.

EBCDIC (Extended Binary-Coded Decimal Interchange Code): An IBM developed character encoding schema. Primarily used by IBM mainframe computers. Compare with ASCII and Unicode.

ebXML (Electronic Business XML): sponsored by UN/CEFACT and OASIS, provides a standard method to exchange messages, conduct trading relationships, communicate data in common terms and define and register business processes. The ebXML initiative, started November 1999, is creating a global framework for the exchange of business data using XML across industries and among businesses of all sizes. It uses SOAP for messaging. It was created to replace/upgrade EDI. Competing solution to BizTalk and RosettaNet. More...

ECMA: European association for standardizing information and communication systems (previously; European Computer Manufacturers Association): is an international industry association founded in 1961 and dedicated to the standardization of information and communication systems. http://www.ecma.ch

ECMAScript: This ECMA Standard is based on several originating technologies, the most well known being JavaScript (Netscape) and JScript (Microsoft). The language was invented by Brendan Eich at Netscape and first appeared in that company's Navigator 2.0 browser. That ECMA Standard was submitted to ISO/IEC JTC 1 for adoption under the fast-track procedure, and approved as international standard ISO/IEC 16262, in April 1998. It is defined as ECMA standard 262.

EDI: Electronic Data Interchange, sponsored by UN/CEFACT, but being replaced by ebXML.

EIA (Electronics Industries Alliance): An organization promoting electronics manufacturing concerns. It has developed standards; e.g., EIA-232 (RS-232), EIA-449, and EIA-530.

EIA-232: A common 25-pin interface standard developed by the EIA. Previously known as RS-232.

EIA-422 standard: A balanced circuit specification used by EIA-449 to define electrical parameters.

EIA-423 standard: An unbalanced circuit specification used by EIA-449 to define electrical parameters.

EIA-449: An interface standard specifying a 37-pin connector and a 9-pin connector. Replaced by EIA-530.

EIA-485: EIA network standard that supports 32 drivers and 32 receivers in bi-directional - half duplex - multi-drop communications mode over a single or dual twisted pair cable. An RS-485 network can be connected in a 2 or 4 wire mode. Maximum cable length is 4000 ft.

EIA-530: An interface standard based on EIA-449 that uses DB-25 pins.

EIA-568: Commercial Building Telecommunications Cabling Standard specifying twisted pair cabling.

EJB (Enterprise JavaBeans): The Enterprise JavaBeans (EJB) specification defines an API that will make it easy for developers to create, deploy and manage cross-platform, component-based enterprise applications that work within the framework of the systems currently in use.

Electric Facility - Facility that includes electric equipment designed for generation, transmission, transformation, distribution and collection of energy, complete with the building assigned to them and the land they are located on. [**DOE Glossary of Electricity Terms]**

Electric Plant (Physical): A facility containing prime movers, electric generators, and auxiliary equipment for converting mechanical, chemical, and/or fission energy into electric energy. [**DOE Glossary of Electricity Terms]**

Electric Power System (EPS): Facilities that deliver electric power to a load. Note: This may include generation units. [**IEEE P1547 Standard for Interconnecting Distributed Resources with Electric Power Systems]**

Electric Power System, Area (Area EPS): An electric power system (EPS) that serves Local EPSs. Note. Typically, an Area EPS has primary access to public rights-of-way, priority crossing of property boundaries, etc., and is subject to regulatory oversight. [**IEEE P1547 Standard for Interconnecting Distributed Resources with Electric Power Systems]**

Electric Power System, Local (Local EPS): An EPS contained entirely within a single premises or group of premises. [**IEEE P1547 Standard for Interconnecting Distributed Resources with Electric Power Systems**]

Electric Rate Schedule: A statement of the electric rate and the terms and conditions governing its application, including attendant contract terms and conditions that have been accepted by a regulatory body with appropriate oversite authority. [**DOE Glossary of Electricity Terms]**

Electric Service Provider (ESP): An entity that provides electric service to a retail or end-use customer. [**DOE Glossary of Electricity Terms]**

Electric Utility: A corporation, person, agency, authority, or other legal entity or instrumentality that owns and/or operates facilities within the United States, its territories, or Puerto Rico for the generation, transmission, distribution, or sale of electric energy primarily for use by the public and files forms listed in the Code of Federal Regulations, Title 18, Part 141. Facilities that qualify as cogenerators or small power producers under the Public Utility Regulatory Policies Act (PURPA) are not considered electric utilities. [**DOE Glossary of Electricity Terms]**

Electricity Sale Contract - Electricity sale contract that provides for supply of energy for more than 1 day.

Electricity Sales Contract - Electricity sale contract covering a period of energy delivery that is not shorter than 1 day, with the volume of energy fixed for each basic trading period of 1 hour.

Electric Power Research Institute: See EPRI

Electronic Commerce: The transaction of business through on-line technologies including the Internet

Electronic Mail (e-mail): A method of sending messages and attached files to anyone in the world with an e-mail address.

Element: any electric al device with terminals that may be connected to other electrical devices such as a generator, transformer, circuit breaker, bus section, or transmission line. An element may be comprised of one or more components. (NERC "*Terms and Their Definitions As Used in the NERC Planning Standards*")

E-mail Address: The address that identifies an electronic post office box where e-mail messages can be sent. All modern e-mail messages have the form UserName@domainAddress.

E-mail Client: A program that allows you to send and receive e-mail. Popular e-mail clients include Eudora, Microsoft Outlook Express, and Netscape Communicator.

include Eudora, Microsoft Outlook Express, and Netscape Communicator.

Emergency Network Operating Conditions - Operating conditions of the equipment, installations and systems expected by the transmission system operator with an emergency outage of the specific grid elements.

Emoticon: Characters that are meant to be viewed sideways that reflect the emotional state of the writer of the message. Because electronic mail does not allow for body language or other emotional clues, emoticons are very useful. Common emoticons are:

:-)	Smile	;-)	Wink
:-(	Frown	:-|	Indifferent
:->	Sarcastic	>:->	Devilish
:'-(	Crying	:'->	Happy and crying
:-@	Screaming	:-&	Tongue tied
:-c	Bummed out	:-o	Surprised
>:-<	Mad	:-/	Skeptical
<:-|	Dunce	:-\	Undecided
:-O	Uh Oh!	@-->----	a Rose

EMS (Energy Management System): used for analyzing the electric power transmission system and for automatic control of generation for load following.

Enabled behavior: The behavior characterizing a set of objects which becomes possible as a result of establishing behavior. [ISO/IEC 10746, OMG UML]

Encoding: A method of converting a message into digital data. Text is character encoded using; e.g., ASCII, cyrillic encoding, or Unicode. Non-text uses UUencode or MIME encoding.

Encryption: The conversion of data into a secret code meant to prevent unauthorized access to confidential information transferred over the Internet or other network. Encryption relies on passwords or code keys for conversion. Popular encryption methods are PGP and SSL. Unencrypted data is called plain text; encrypted data is referred to as cipher text.

End-Use Customer - Customer that consumes in its own ends all the purchased energy.

Energy: The capacity for doing work as measured by the capability of doing work (potential energy) or the conversion of this capability to motion (kinetic energy). Energy has several forms, some of which are easily convertible and can be changed to another

form useful for work. Most of the world's convertible energy comes from fossil fuels that are burned to produce heat that is then used as a transfer medium to mechanical or other means in order to accomplish tasks. Electrical energy is usually measured in kilowatthours, while heat energy is usually measured in British thermal units. [**DOE Glossary of Electricity Terms]**

Energy Charge: That portion of the charge for electric service based upon the electric energy (kWh) consumed or billed. [**DOE Glossary of Electricity Terms]**

Energy Deliveries: Energy generated by one electric utility system and delivered to another system through one or more transmission lines. [**DOE Glossary of Electricity Terms]**

Energy Efficiency: Refers to programs that are aimed at reducing the energy used by specific end-use devices and systems, typically without affecting the services provided. These programs reduce overall electricity consumption (reported in megawatthours), often without explicit consideration for the timing of program-induced savings. Such savings are generally achieved by substituting technically more advanced equipment to produce the same level of end-use services (e.g. lighting, heating, motor drive) with less electricity. Examples include high-efficiency appliances, efficient lighting programs, high-efficiency heating, ventilating and air conditioning (HVAC) systems or control modifications, efficient building design, advanced electric motor drives, and heat recovery systems. [**DOE Glossary of Electricity Terms]**

Energy Receipts: Energy generated by one electric utility system and received by another system through one or more transmission lines. [**DOE Glossary of Electricity Terms]**

Energy Source: The primary source that provides the power that is converted to electricity through chemical, mechanical, or other means. Energy sources include coal, petroleum and petroleum products, gas, water, uranium, wind, sunlight, geothermal, and other sources. [**DOE Glossary of Electricity Terms]**

Energy Supply and Delivery Curtailments - Curtailments applied to consumption of energy by customers (industrial ones in the first place) with a deficit of capacity or energy and in case of disturbance or a state of emergency in the power system.

Engineering interface reference: An identifier, in the context of an engineering interface reference management domain, for an engineering object interface that is available for distributed binding. [ISO/IEC 10746, OMG UML]

Engineering interface reference management domain: A set of nodes forming a naming domain for the purpose of assigning engineering interface references. [ISO/IEC 10746, OMG UML]

Engineering interface reference management policy: A set of permissions and prohibitions that govern the federation of engineering interface reference management domains. [ISO/IEC 10746, OMG UML]

Engineering viewpoint: A viewpoint on an ODP system and its environment that focuses on the mechanisms and functions required to support distributed interaction between objects in the system. [ISO/IEC 10746, OMG UML]

Enterprise Architecture - An Enterprise Architecture is a well-defined set of data structures, system components and processes that enable interoperability between diverse business entities across a wide set of domains.

Enterprise viewpoint: A viewpoint on an ODP system and its environment that focuses on the purpose, scope and policies for that system. [ISO/IEC 10746, OMG UML]

Entity: Any concrete or abstract thing of interest. [ISO/IEC 10746, OMG UML]

Environment: In the IECSA Reference Architecture, an Environment is a "domain" which is characterized by a common set of communication and information requirements.

Environment (of an object): The part of the model which is not part of that object. [ISO/IEC 10746, OMG UML]

Environment contract: A contract between an object and its environment, including quality of service constraints, usage and management constraints. [ISO/IEC 10746, OMG UML]

Epoch: A period of time for which an object displays a particular behavior. Any one object is in a single epoch at one time, but interacting objects may be in different epochs at the time of interaction. [ISO/IEC 10746, OMG UML]

EPRI: Electric Power Research Institute was founded in 1973 as a non-profit energy research consortium for the benefit of utility members, their customers, and society. Their mission is to provide science and technology-based solutions of indispensable value to our global energy customers by managing a far-reaching program of scientific research, technology development, and product implementation. http://www.epri.com/

Equivalent load center: The equivalent load center is the site where the load of the distribution transformer is connected and is distanced from the secondary bus of the distribution transformer by a nominal secondary voltage drop value.

Error: Part of an object state which is liable to lead to failures. A manifestation of a fault in an object. [ISO/IEC 10746, OMG UML]

Establishing behavior: The behavior by which a given contract is put in place between given objects. An establishing behavior can be a) explicit, resulting from the interactions

of objects that will take part in the contract; or b) implicit, being performed by an external agency (e.g. a third party object, not taking part in the contract) or having been performed in a previous epoch. [ISO/IEC 10746, OMG UML]

E-text: The full text of a document available in electronic format.

Ethernet: A network standard first developed by Xerox, and refined by DEC and Intel (DIX). Ethernet interconnects personal computers and transmits at 10 Mbps. It uses a bus topology. The access mechanism is CSMA/CD. Today the term Ethernet includes 10 (Ethernet)/100 (Fast Ethernet)/1000 (Gigabit Ethernet) Mbps technologies and the IEEE 802.3 standard. .

Evaluation: An action that assesses the value of something. [ISO/IEC 10746, OMG UML]

Excitation Control System - Set of equipment for control (through a change of the excitation current) of voltage or reactive power seen at terminals of the generating unit.

Expected Unserved Energy (EUE) - LOLP measures the instance of load being greater than the generation and other dispatchable resources available to meet it. EUE measures at each such occurrence the amount of load that went unserved, the total kilowatt-hours of outages that resulted.

Event Report: Event Report is the report generated in the Server by the action of a Transfer Set to be sent to the Client.

Extranet: "Extranet" refers to extending the LAN via remote or Internet access to partners outside the organization such as frequent suppliers and purchasers. Such relationships should be over authenticated link to authorized segments of the LAN and are frequently encrypted for privacy.

Extranet Web Sites: Access limited to users within the organization and restricted access is granted to selected business partners.

F

Facility: An existing or planned location or site at which prime movers, electric generators, and/or equipment for converting mechanical, chemical, and/or nuclear energy into electric energy are situated, or will be situated. A facility may contain more than one generator of either the same or different prime mover type. For a cogenerator, the facility includes the industrial or commercial process. [**DOE Glossary of Electricity Terms]**

Failure: Violation of a contract. [ISO/IEC 10746, OMG UML]

Failure transparency: A distribution transparency which masks, from an object, the failure and possible recovery of other objects (or itself), to enable fault tolerance. [ISO/IEC 10746, OMG UML]

Fault: A situation that may cause errors to occur in an object. [ISO/IEC 10746, OMG UML]

FAQ (Frequently Asked Question): A compilation of the most often asked questions and answers on a topic.

Fast Ethernet: A version of the IEEE 802.3 standard with speeds of 100-Mbps. See 100Base-T, 100VG-AnyLAN, and 100Base Cabling Systems.

Favorites, see bookmarks.

FCC: The Federal Communications Commission is an independent United States government agency, directly responsible to Congress. The FCC was established by the Communications Act of 1934 and is charged with regulating interstate and international communications by radio, television, wire, satellite and cable. http://www.fcc.gov

FDDI (Fiber Distributed Data Interface): An American National Standards Institute (ANSI)-specified standard using fiber optics, dual ring topology, token passing access method, with data rates up to 100 Mbps. The standard specifies: multimode fiber; 50/125, 62.5/125, or 85/125 core cladding; an LED or laser light source; and 2 km for unrepeated data transmission at 40 Mbps. IPv6 over FDDI; RFC 2467.

FDM (Frequency-Division Multiplexing): FDM is a scheme in which numerous signals are combined for transmission on a single communications line or channel. Each signal is assigned a different frequency (subchannel) within the main channel. See also TDM.

FDMA (Frequency Division Multiple Access): FDMA uses FDM technology for systems which have many users needing access at the same time. Examples are satellite systems and analog cellular phone systems.

Federated Systems - Federation is a set of cooperating, yet autonomous systems that have no centralized control. Federated systems allow entities to define policies and procedures governing access and control of local resources and data.

<X> Federation: A community of <x> domains. [ISO/IEC 10746, OMG UML]

FERC (Federal Energy Regulatory Commission): FERC was created through the Department of Energy Organization Act on October 1, 1977. At that time, the Commission's predecessor, the Federal Power Commission (FPC), was abolished, and the new agency (FERC) inherited most of the FPC's responsibilities. The Federal Energy Regulatory Commission is an independent regulatory agency within the Department of Energy that:

- Regulates the transmission and sale of natural gas for resale in interstate commerce;
- Regulates the transmission of oil by pipeline in interstate commerce;
- Regulates the transmission and wholesale sales of electricity in interstate commerce;
- Licenses and inspects private, municipal and state hydroelectric projects;
- Oversees environmental matters related to natural gas, oil, electricity and hydroelectric projects;
- Administers accounting and financial reporting regulations and conduct of jurisdictional companies, and;
- Approves site choices as well as abandonment of interstate pipeline facilities.

[FERC]

Field of Application (of a specification): The properties the environment of the ODP system must have for the Specification of that system to be used. [ISO/IEC 10746, OMG UML]

File: Any computer document or program can be called a file although normally used to refer to a document created by a computer program.

File Compression: A method of storing files that uses less hard drive space than regular file formats. Compressed files cannot be used until they have been decompressed. Compressed files are easier to send across the Internet since they take less time to send and receive and are less susceptible to file corruption. Popular compression methods are PkZip for PC's (ending in .zip), Stuffit for Macintosh (ending in .sit), and gzip for Unix (ending in .Z). There are of course, many other compression methods used. Each format requires the appropriate program to compress and decompress the files.

File Server: A computer specifically intended for storing files that people can share over a network. The computer being used as the file server might not be able to be used for other common workstation tasks.

Finger: A software utility for locating people on other Internet sites. Finger is also sometimes used to give access to non-personal information, but the most common use is to see if a person has an account at a particular Internet site. Many sites do not allow incoming Finger requests, but many do.

Firewall: A system or combination of systems that enforces a boundary between two or more networks. A firewall is configurable to allow only certain information and messages. Both incoming and outgoing traffic is controlled.

Firm Power: Power or power-producing capacity intended to be available at all times during the period covered by a guaranteed commitment to deliver, even under adverse conditions. [**DOE Glossary of Electricity Terms]**

First Mile: A web site's connection to the Internet. The bandwidth of the first mile is determined by the site's internal network and the Internet connections provided by one or more ISPs. See also Internet Bottlenecks.

Flame: Originally, flame meant to debate in a passionate manner and many had polished their debate skills to an art form. Unfortunately, many debates turned into flame wars to the point that "to flame" someone became a derogatory term. As such, flame has come to refer to any kind of derogatory comment no matter how witless or crude.

Flame War: A heated debate that becomes rather personal in its attack loosing the original argument in the process. Some people still love to try to start flame wars then sit back and watch the fun.

Flamefest: Massive flaming.

Flaming: Sending hate email to an Internet user, usually a company or person who has violated netiquette, the rules of online conduct. A user who writes flames is known as a flamer.

Flow: An abstraction of a sequence of interactions, resulting in conveyance of information from a producer object to a consumer object. A flow may be used to abstract over, for example, the exact structure of a sequence of interactions, or over a continuous interaction including the special case of an analogue information flow. [ISO/IEC 10746, OMG UML]

FM (Frequency Modulation): FM changes its frequency in accordance with a modulating signal. The unmodulated frequency of a FM signal is called its center frequency. When a modulating signal is applied, the FM transmitter's frequency will swing above and below the center frequency according to the modulating signal.

Font: The style and format of the characters displayed in a document, also called a typeface.

Foo: A placeholder for nearly anything: a variable, function, procedure, or even person.

Forced Outage: The shutdown of a generating unit, transmission line or other facility, for emergency reasons or a condition in which the generating equipment is unavailable for load due to unanticipated breakdown. [**DOE Glossary of Electricity Terms]**

Forking action: A dividing action, where the enabled chains must (subject to failure) eventually join each other, i.e. the enabled chains cannot join other chains and they cannot terminate separately. [ISO/IEC 10746, OMG UML]

FQDN (Fully Qualified Domain Name): The FQDN is the full name of a system, rather than just its hostname.

Fractional T1: A service aimed at customers who don't need all 24 channels of a full T1 line. Fractional T1 service offers the use of one or more channels. The customers, then, pay only for the channels they use.

Frame Relay: An ITU-T recommendation (I.122) and ANSI standard (T1S1). Frame relay is an ISDN packet-mode bearer service that defines a user-to-network interface. The two main benefits are bandwidth on demand and integrated access. The standard currently addresses data communications speeds up to 44 Mbps (T-3 Line) over permanent virtual circuits. By reducing the network functions performed, frame relay takes advantage of more robust physical facilities to improve throughput.

Freenet: An organization to provide free Internet access to people in a certain area, usually through public libraries.

Freeware: Software that can be used and distributed for free. Freeware may still be copyrighted and the author's rights should always be honored.

Frequency Control - Control taking place in the power system, meant to maintain the stable value of frequency or reduce the deviation of the synchronous time from the astronomic one down to the limits allowed by the IRiESP. The synchronous time ts is defined by the following formula: ç = *dt t f*

FSK (Frequency-Shift Keying): The earliest modems used a technique known as Frequency-Shift Keying (FSK) to represent digital data. FSK devices, such as the Bell 103 modem, used one tone (1070Hz) for zeros and another tone (1270Hz) for 1's.

FTAM: File Transfer, Access and Management. Compare with FTP (File Transport Protocol).

FTP (File Transport Protocol): In TCP/IP, an application layer protocol used to copy files from one computer to another. Defined in RFC959 and updates in RFC2228, RFC2640, and RFC2773.

Full Duplex Mode: A transmission mode indicating that both ends of a communications link can transmit data simultaneously.

Futures Market: Arrangement through a contract for the delivery of a commodity at a future time and at a price specified at the time of purchase. The price is based on an auction or market basis. This is a standardized, exchange-traded, and government regulated hedging mechanism. [**DOE Glossary of Electricity Terms]**

G

Gas Turbine Plant: A plant in which the prime mover is a gas turbine. A gas turbine consists typically of an axial-flow air compressor, one or more combustion chambers, where liquid or gaseous fuel is burned and the hot gases are passed to the turbine and where the hot gases expand to drive the generator and are then used to run the compressor. [**DOE Glossary of Electricity Terms]**

Gateway: A device that connects one network with another, when the 2 networks are using different protocols. The term can also refer to a system capability that provides direct access to other remote networks or services.

GenCo: Generation Company.

Generating Unit: Any combination of physically connected generator(s), reactor(s), boiler(s), combustion turbine(s), or other prime mover(s) operated together to produce electric power. [**DOE Glossary of Electricity Terms]**

Generation (Electricity): The process of producing electric energy by transforming other forms of energy; also, the amount of electric energy produced, expressed in watthours (Wh). [**DOE Glossary of Electricity Terms]**

Generation Company: A regulated or non-regulated entity (depending upon the industry structure) that operates and maintains existing generating plants. The generation company may own the generation plants or interact with the short-term market on behalf of plant owners. In the context of restructuring the market for electricity, the generation company is sometimes used to describe a specialized "marketer" for the generating plants formerly owned by a vertically-integrated utility. [**DOE Glossary of Electricity Terms]**

Generator: A machine that converts mechanical energy into electrical energy. [**DOE Glossary of Electricity Terms]**

Generator Nameplate Capacity: The full-load continuous rating of a generator, prime mover, or other electric power production equipment under specific conditions as designated by the manufacturer. Installed generator nameplate rating is usually indicated on a nameplate physically attached to the generator. [**DOE Glossary of Electricity Terms]**

GID (Generic Interface Definition): identifies explicitly which features of existing APIs (such as DAF and DAIS) will be implemented to exchange data implemented in CIM-based databases, to extend these capabilities to include features needed in utility operations, and to specify the exact formats to use when implemented over different types of middleware (e.g. Corba or Microsoft COM).

GIF (Graphic Interchange Format): A common format for image files using compression defined by CompuServe. GIF format files of simple images are often smaller than the same file would be if stored in JPEG format, but GIF format is limited to 256 or less colors.

Gigabit Ethernet: Part of the IEEE 802.3 standard for data rates of 1000 Mbps or 1 Gbps. See 1000Base-LX, 1000Base-CX, 1000Base-SX, and 1000Base-T.

Gigawatt (GW): One billion watts. [**DOE Glossary of Electricity Terms]**

Gigawatthour (GWh): One billion watthours. [**DOE Glossary of Electricity Terms]**

GIS (Geographical Information System): comprising a graphical database of geographical maps of the power system, and a database of asset information. The term is used almost interchangeably with AM/FM.

Gopher: The predecessor to the World Wide Web, gopher is a system that organizes information in a hierarchical menu, allowing one to find and access information quickly. Created at the University of Minnesota, home of the Golden Gophers.

GPS (Global Positioning System): GPS is a satellite-based system that provides time and 3-dimensional location information to commercially available receivers. These receivers are often used by utilities to provide very accurate time at dispersed locations.

Granularity: The relative fineness or coarseness by which a mechanism can be adjusted.

Grid: The layout of an electrical distribution system. [**DOE Glossary of Electricity Terms]**

<X> Group: A set of objects with a particular characterizing relationship <X>. The relationship <X> characterizes either the structural relationship among objects or an expected common behavior of the objects. [ISO/IEC 10746, OMG UML]

GSM (Global System for Mobile Communications): GSM is the cellular phone technology used in Europe and most countries around the world. It is gradually being introduced into the United States.

GUI (Graphical User Interface): The method whereby a user interacts with a computer through icons, windows, pointing devices, etc. as opposed to a text or command line interface where all commands and actions are typed out.

Guru: Any person with a lot of experience in a certain topic or area of study.

H

Hack: Any software in which a significant portion of the code was originally another program.

Hacker: Those intent upon entering an environment to which they are not entitled entry for whatever purpose. Usually iterative techniques escalating to more advanced methodologies and use of devices to intercept the communications property of another. See also Cracker.

Half Duplex Mode: A data communications term that indicates that only one end of a communications link can transmit data at the same time; one end must wait for acknowledgement of its data transmission from the other end before it can continue transmitting another data packet. See also Full Duplex Mode.

Hamming Code: A method that adds redundant bits to a data unit to detect and correct bit errors.

Hayes-Compatible Modems: An intelligent modem capable of more than just modulation and demodulation.

HDLC (High level Data Link Control): A bit oriented data link protocol defined by the ISO. It is used in the X.25 protocol. A subset, called link access procedure (LAP), is used in other protocols. It is also a base for many data link protocols used in LANs.

HDSL: High bit rate Digital Subscriber Line (HDSL) is a bidirectional and symmetrical transmission system that allows the transport of signals with a bit rate of 1.544 Mbps or 2.048 Mbps on the twisted pairs of an access network.. It can be used without amplification up to 3.6 Km. ITU-T recommendation G.991.1. See also xDSL.

Header: The portion of a packet, proceeding the actual data, containing source and destination addresses and error-checking fields.

Head action: In a given activity, an action that has no predecessor. [ISO/IEC 10746, OMG UML]

Helper Applications: Additional software occasionally needed to help a Web browser program deal with a file on the Internet. When the file is downloaded, a helper application takes over for the Web browser to open and run the file. An example of a helper application is the Real Player. It opens and plays Real audio/video files when they are encountered on the Internet.

High Voltage - Voltages 750, 400 or 220 kV.

High-Frequency Voltage Factor - Ratio of the square root of the sum square of the rms values of the higher order harmonic contents to the rms value of the first harmonic.

Hit: A hit has come to mean many things and is possibly one of the most misleading terms used among web sites. Technically, a hit is counted for each file transferred from the web server to the web browser and has led to many exaggerated claims on web sites. This is because if a web page has 5 graphics on it, it counts as 6 hits; one for the web page itself and 5 for each of the graphics. Unfortunately, hits has been misleadingly used to refer to the number of times a particular web page has been loaded so that a person thinks the site has been visited 6 times by 6 people when it was only visited once.

Home Page: Originally it referred to the web page that was loaded when a web browser was first launched. It also refers to the primary web page for a web site.

Honeypot: Honeypots are programs that simulate one or more network services that you designate on your computer's ports. An attacker assumes you're running vulnerable services that can be used to break into the machine. A honeypot can be used to log access attempts to those ports including the attacker's keystrokes. This could give you advanced warning of a more concerted attack. Honeypots are most successful when run on well-know servers, such as Web, mail, or DNS servers because these systems are often attacked. They can also be used when a system comes under attack by substituting a honeypot system for the target.

Host: Any computer (node) connected to a network which is directly used by resources (e.g., public domain programs, text/data files, mailboxes, etc.). An Internet host can be identified by its dotted quad address or its distinctive domain name. This computer system may also be the source of network services on which you may hold an interactive session if you are a valid user of that system.

Host-based Security: The technique of securing an individual system from attack. Host-based security is operating system and version dependent.

Hostname: The name given to a computer; PC, workstation or server.

Hot Standby: A backup system configured in such a way that it may be used if the system goes down.

Hourly reserve - Mean hourly available capacity of thermal running generating unit, reduced by its actual load, second and minute reserve volume or available capacity of generating unit that is not in operation being able to start-up and synchronization with the grid within time no longer than 30 min.

HTML (HyperText Markup Language): The computer “language” of the World Wide Web, comprised of the coding, or tags, that indicate how text and images are to be displayed, as well as how documents and files are to be linked. HTML was developed at CERN. It is based on SGML.

HTTP (HyperText Transport Protocol): HTTP is an application-level protocol with the lightness and speed necessary for distributed, collaborative, hypermedia information systems. HTTP has been in use by the World-Wide Web global information initiative since 1990. Secure HTTP (S-HTTP) is a secure message-oriented communications protocol designed for use in conjunction with HTTP. HTTP v1.1 is defined in RFC 2616 and RFC 2617, with updates in RFC 2817.

HTTPS: Hypertext Transfer Protocol Security. In the World Wide Web, a protocol that facilitates the transfer of hypertext-based files between local and remote systems. Makes use of SSL/TLS to provide security. It is designed to coexist with HTTP's messaging model. [Modified from: ANSI T1.523-2001]

Hub: (1) A local network device. Either a repeater or a bridge. (2) A regional point of connection between an Internet user and the Internet. Regional hubs are also called ISPs, which sell their networking services for a fee.

Hyperlink: A reference in an HTML document that leads to a separate document or media file and allows the reader to follow non-linear information trails through HTML documents. Although primarily a computer based concept, some have tried to create printed books based upon hyperlinks/hypertext.

Hypertext: Any text that contains links (hyperlinks) to other text in the same document or other documents. The World Wide Web is based upon hypertext but is not the only example of hypertext. Many help systems on computers are based upon hypertext. One of the first commercial programs using hypertext was Apple's HyperCard.

HYTELNET: Program that provides flexible connection to a variety of networked information resources including online public access catalogs.

I

IAB (Internet Architecture Board): A "regulatory body" that makes decisions about standards and other vital issues regarding the Internet.

IANA (Internet Assigned Numbers Authority): an organization working under the auspices of the IAB that is responsible for assigning new Internet-wide IP addresses. http://www.iana.org. See also ICANN.

ICANN (The Internet Corporation for Assigned Names and Numbers): is the non-profit corporation that was formed to assume responsibility for the IP address space allocation, protocol parameter assignment, domain name system management, and root server system management functions previously performed under U.S. Government contract by IANA and other entities. http://www.icann.org.

ICCP (Inter-control Center Communications Protocol): used for the exchange of real-time data between control centers and other power utility facilities. It was developed as part of the UCA suite of protocols, but is now standardized through the IEC as TASE.2.

ICMP (Internet Control Message Protocol): A an extension to the Internet Protocol (IP) in the TCP/IP protocol suite that handles errors, informational, and control messages. Defined in RFC 0792. Also see RFC 2463, RFC 2466, RFC 2521.

ICQ: A program that allows you to chat with and leave messages for other people, which also have ICQ.

IDEA (International Data Encryption Algorithm), It is a secret key block cipher algorithm that uses a 128-bit key to operate on a 64-bit block of plain text. Eight rounds are performed for each block in order for the cipher text to be produced. Formerly known as IPES (Improved Proposed Encryption Standard) and developed by Xuejia Lai and James L. Massey, of ETH Zurich. It is used by; e.g., PGP.

Identifier: An unambiguous name, in a given naming context. [ISO/IEC 10746, OMG UML]

IEC (International Electrotechnical Council): IEC Technical Councils (TC) develops standards for the Electrical Power Industry.

IEC TC 57: IEC TC 57 develops telecontrol standards for the power industry. Different TC 57 Working Groups (WG) focus on specific areas. Specifically, **WG 03** developed the IEC 870-5 protocol for telecontrol (which is the basis for the DNP protocol), **WG 07** developed TASE.2 which is also known as ICCP, **WG 09** is working on power line carrier for distribution automation, **WG 10, 11, & 12** focus on communications within

substations and on distribution feeders, and have undertaken the standardization of UCA for these environments, **WG 13** is developing the Common Information Model (CIM), **WG 14** is developing Information Exchange Models for Distribution Operations, **WG 15** is working on security for the IEC TC 57 protocols, and **WG 16** is developing guidelines for market interfaces.

IED (Intelligent Electronic Device): Programmable monitoring, control, protection, or data processing device with at least one serial communication interface.

IEEE (Institute of Electrical and Electronic Engineers): An international society of professional engineers that issues widely used networking standards. http://www.ieee.org

IEEE 802.12: The draft standard for 100BASEVG networking.

IEEE 802.2: A data-link layer standard used with IEEE 802.3, IEEE 802.4, and IEEE 802.5.

IEEE 802.3: The IEEE standard for Ethernet; a physical-layer standard that uses the CSMA/CD access method on a bus-topology LAN. It defines five baseband and one broadband standard. The baseband specifies a digital signal using Manchester encoding and includes 10Base5, 10Base2, 10Base-T, 1Base5, 100Base-T, and Gigabit Ethernet. Broadband includes 10Broad36, which specifies an analog signal using PSK encoding.

IEEE 802.4 A physical-layer standard that uses the token-passing access method on a bus-topology LAN.

IEEE 802.5: A physical-layerstandard that uses the token-passing access method on a ring-topology LAN.

IEEE 802.11: A wireless LAN standard with a range of about 100 meters. Compare with personal-area network standard Bluetooth.

IETF (Internet Engineering Task Force): The Internet Engineering Task Force (IETF) is a large open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. It is open to any interested individual. The actual technical work of the IETF is done in its working groups, which are organized by topic into several areas (e.g., routing, transport, security, etc.). Much of the work is handled via mailing lists. The IETF holds meetings three times per year. http://www.ietf.org

IGMP (Internet Group Management Protocol): A protocol in the TCP/IP protocol suite that handles multicasting. The mechanisms of the protocol allow a host to inform its local router, using Host Membership Reports, that it wants to receive messages addressed to a specific multicast group. Defined in RFC2236, which updates RFC1112. Merged into ICMPv6 in IPv6.

IGP (Interior Gateway Protocol): Routing protocol used inside an Autonomous System. See OSPF and RIP.

IIOP (Internet Inter-Orb Protocol): CORBA protocol. Also used in J2EE.

Image Map: A method where a webmaster can create links on a graphic image. Areas are specified to have hyperlinks. An image map can be server and/or client based.

IMAP: A protocol for e-mail. It is an alternative to POP3. IMAP based mail is server oriented. The client must be connected to the server to access the mail for reading or make modifications to the way the mail is stored.

IMHO (In My Humble Opinion): This usually accompanies a statement that may bring about personal offense or strong disagreement.

Implementable standard: A template for a technology object. [ISO/IEC 10746, OMG UML]

Implementation: A process of instantiation whose validity can be subject to test. [ISO/IEC 10746, OMG UML]

Inbox: The place mail is initially downloaded and saved in the mail client after connecting to a mail server.

Independent Power Producers (IPP): Entities that are also considered nonutility power producers in the United States. These facilities are wholesale electricity producers that operate within the franchised service territories of host utilities and are usually authorized to sell at market-based rates. Unlike traditional electric utilities, Independent Power Producers do not possess transmission facilities or sell electricity in the retail market. [**DOE Glossary of Electricity Terms]**

Independent System Operators (ISO): An independent, Federally-regulated entity that coordinates regional transmission in a non-discriminatory manner and ensures the safety and reliability of the electric system. [**DOE Glossary of Electricity Terms]**

Industrial [Customer]: The industrial sector is generally defined as manufacturing, construction, mining agriculture, fishing and forestry establishments Standard Industrial Classification (SIC) codes 01-39. The utility may classify industrial service using the SIC codes, or based on demand or annual usage exceeding some specified limit. The limit may be set by the utility based on the rate schedule of the utility. [**DOE Glossary of Electricity Terms]**

Infobahn: Term being bandied about Capitol Hill as a faster and more global-sounding replacement for the cumbersome "information super highway".

Information and Content Exchange (ICE): ICE is an XML-based standard protocol for electronic business-to-business (B2B) asset management. ICE defines an architecture and a common language that can be used as a means of automating Web content syndication (information sharing and reuse between Web sites) for publishing and e-commerce uses. Members of the ICE Authoring Group (which includes representatives from Adobe Systems, Microsoft, Sun Microsystems, Vignette, and National Semiconductor) are committed to the further development of ICE as an open standard. ICE version 1.1 was released in June 2000.

Information Exchange Model (IEM): A meta-model of the information that is exchanged between entities, including both object models and actions.

Information Superhighway: An oft used term referring to the Internet.

Information viewpoint: A viewpoint on an ODP system and its environment that focuses on the semantics of information and information processing. [ISO/IEC 10746, OMG UML]

Informational Resource: The definition of informational resource shall be restricted to the Pieces of Information Communicated (PICOMs) electronically. It shall not include the physical computational resource.

INFOSEC: Information systems security (INFOSEC and/or ISS): [The] protection of information systems against unauthorized access to or modification of information, whether in storage, processing or transit, and against the denial of service to authorized users, including those measures necessary to detect, document, and counter such threats. [From ANSI T1.523-2001]

Infrared (IR): Infrared radiation (IR) or the term *infrared* alone refers to energy in the region of the electromagnetic radiation spectrum at wavelengths longer than those of visible light, but shorter than those of radio waves. Correspondingly, the frequencies of IR are higher than those of microwaves, but lower than those of visible light. Infrared is used in a variety of wireless communications, monitoring, and control applications. A few of the applications include home-entertainment remote-control boxes, wireless local area networks, links between notebook computers and desktop computers, cordless modems, intrusion detectors, motion detectors, and fire sensors

Initiating object (with respect to a communication): An object causing a communication. [ISO/IEC 10746, OMG UML]

Insider Attack - A security attack originating from inside a protected network.

Inspection of Electrical Equipment - Operations planned in the province of maintenance of the electric facilities, equipment and installations, resulting from diagnostics and assessment of the condition, meant to maintain their proper technical condition, covering:

a) visual inspections, checks, tests and measurements;
b) repairs and maintenance work;
c) replacement or additions.

Installed capacity - The highest long-lasting capacity of the generating unit or generator, confirmed by tests, delivered in the rated operating conditions, maintained:

a) by the thermal generator for an uninterrupted period of at least 15 hours;
b) by the run-of-river hydro generator for an uninterrupted period of at least 5 hours;
c) by the pumped-storage generator for an uninterrupted period that depends on capacity of the top reservoir.

Instance: An <X> that satisfies the type. [ISO/IEC 10746, OMG UML]

Instantiation (of an <X> Template): An <X> produced from a given <X> template and other necessary information. This <X> exhibits the features specified in the <X> template. <X> can be anything that has a type. [ISO/IEC 10746, OMG UML]

Insider Attack: An attack originating from inside a protected network.

Instance Of (When Instantiated): Phrase used to denote that an abstraction (Data Object) takes on a real-world form (syntax) and behavior (semantics) of a person, place or thing that it represents (i.e., it becomes implemented in an actual system).

Instrument Protection Factor (FS) - Ratio of the instrument rated safe current to the rated primary current. The instrument rated safe current is defined as the rms value of the primary current which makes the total error of the current transformer remain with the rated load at 10% or more.

Integration: (System Integration) The progressive linking and testing of system components to merge their functional and technical characteristics into a comprehensive, interoperable system. Note: Integration of data systems allows data existing on disparate systems to be shared or accessed across functional or system boundaries.

Integrity: [In INFOSEC, the] quality of an information system (IS) reflecting the logical correctness and reliability of the operating system; the logical completeness of the hardware and software implementing the protection mechanisms; and the consistency of the data structures and occurrence of the stored data. Note that, in a formal security mode, integrity is interpreted more narrowly to mean protection against unauthorized modification or destruction of information. [INFOSEC-99] [T1 Glossary 2000: Glossary of Telecommunications Terms]

Interaction point: A location at which there exists a set of interfaces. [ISO/IEC 10746, OMG UML]

<X> interceptor: An engineering object in a channel, placed at a boundary between <x> domains. An <x> interceptor performs checks to enforce or monitor policies on permitted interactions between basic engineering objects in different domains; performs transformations to mask differences in interpretation of data by basic engineering objects in different domains. [ISO/IEC 10746, OMG UML]

Interchange reference point: A reference point at which an external physical storage medium can be introduced into the system. An interchange conformance requirement is stated in terms of the behavior (access methods and formats) of some physical medium so that information can be recorded on one system and then physically transferred, directly or indirectly, to be used on another system. [ISO/IEC 10746, OMG UML]

Interchange Schedule: A schedule of energy that flows from one physical service area to another. Interchange Schedules also include ramp rates. They are communicated between transmission system operators such as ITPs, RTOs, etc.

Interface (I/F): 1. In a system, a shared boundary, i.e., the boundary between two subsystems or two devices. 2. A shared boundary between two functional units, defined by specific attributes, such as functional characteristics, common physical interconnection characteristics, and signal characteristics. 3. A point of communication between two or more processes, persons, or other physical entities. 4. A point of interconnection between user terminal equipment and commercial communications facilities. 5. To interconnect two or more entities at a common point or shared boundary. 6. An abstraction of the behavior of an object that consists of a subset of the interactions of those object together with a set of constraints on when they may occur. [ISO/IEC 10746, OMG UML]

Interface role: A role of a community identifying behavior which takes place with the participation of objects that are not a members of that community. [ISO/IEC 10746, OMG UML]

Interface signature: The set of action templates associated with the interactions of an interface. [ISO/IEC 10746, OMG UML]

Internet: The worldwide network of networks based on the TCP/IP protocol suite. The Internet is not single service and has no real central "hub." It is not owned by any one group. Rather, it is a collection of tens of thousands of networks, online services, and single-user components all based on the idea of a free exchange of ideas and services. Also, when not capitalized, any interconnected set of networks; internet. See also WWW.

Internet2: Internet2 is a collaboration among more than 100 U.S. universities to develop networking and advanced applications for learning and research. Since much teaching, learning, and collaborative research may require real-time multimedia and high-bandwidth interconnection, a major aspect of Internet2 is adding sufficient network

infrastructure to support such applications. But Internet2 also intends to investigate and develop new ways to use the Internet and the Internet2 infrastructure for its educational purposes. Although Internet2 is not envisioned as a future replacement for the Internet, its organizers hope to share their developments with other networks, including the Internet. Internet2 will include and further develop the National Science Foundation's very high-speed Backbone Network Service (vBNS) that currently interconnects research supercomputer centers in the U.S. The involved institutions plan to continue using the existing Internet for "ordinary" services such as e-mail, personal Web access, and newsgroups. From WhatIs.com

Internet Address: A 32-bit or 128-bit network-layer address used to uniquely define a host on the Internet using the TCP/IP protocols. See also IP Address.

Internet Backbone: A high-speed, large-bandwidth network that connects local area networks and individual computers over long distances. A network's capacity is determined by the capacity of its cables and routers.

Internet Bottlenecks: Four areas that can slow down the end-to-end delivery of a packet; First Mile, Backbone, Peering Points, and Last Mile. See also Routing.

Internet eXchange: See Peering Points.

Internet Explorer: See Microsoft Internet Explorer

Internet Phone: A program that allows voice communication with other Internet users using a speaker and microphone.

Internet Protocol, see IP.

Internet Site: A computer connected to the Internet that contains information that can be accessed using a navigation tool such as HTTP, FTP, TELNET, Gopher, etc.

Internet Web Sites: A site on the Internet that supports access using web technologies; e.g., HTTP and HTML.

Internetworking Protocol, see IP.

InterNIC: The Internet Network Information Center. An association that stores information about the Internet as well as the group that monitors and issues Domain names. http://www.internic.net.

Interoperability: **1.** The ability of systems, units or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together. [JP 1-02] **2.** The condition achieved among communications-electronics systems or items of communications-electronics equipment when information or services can be exchanged directly and satisfactorily between them

and/or their users. The degree of interoperability should be defined when referring to specific cases. [JP 1-02] **3.** Allows applications executing on separate hardware platforms, or in multi-processing environments on the same platform, to share data and cooperate in processing it through communications mechanisms such as remote procedure calls, transparent file access, *etc.* [JP 1-02] **4.** The ability of a set of modeling and simulation to provide services to and accept services from other modeling and simulation, and to use the services for exchange enabling them to operate effectively together. [JP 1-02] **5.** The capability to provide useful and cost-effective interchange of electronic data among, *e.g.*, different signal formats, transmission media, applications, industries, or performance levels. See T1 Glossary 2000: Glossary of Telecommunications Terms

Interoperate: The ability of multi-vendor computers to work together using a common set of protocols. With interoperability, PC's Mac's, Suns, etc, all work together allowing one host computer to communicate with and take advantage of the resources of another.

Interrogation: An interaction consisting of one interaction -- the invocation -- initiated by a client object, resulting in the conveyance of information from that client object to a server object, requesting a function to be performed by the server object, followed by a second interaction -- the termination -- initiated by the server object, resulting in the conveyance of information from the server object to the client object in response to the invocation. [ISO/IEC 10746, OMG UML]

Interruptible Load: Refers to program activities that, in accordance with contractual arrangements, can interrupt consumer load at times of seasonal peak load by direct control of the utility system operator or by action of the consumer at the direct request of the system operator. It usually involves commercial and industrial consumers. In some instances the load reduction may be affected by direct action of the system operator (remote tripping) after notice to the consumer in accordance with contractual provisions. For example, loads that can be interrupted to fulfill planning or operation reserve requirements should be reported as Interruptible Load. Interruptible Load as defined here excludes Direct Load Control and Other Load Management. (Interruptible Load, as reported here, is synonymous with Interruptible Demand reported to the North American Electric Reliability Council on the voluntary Form EIA-411, "Coordinated Regional Bulk Power Supply Program Report," with the exception that annual peakload effects are reported on the Form EIA-861 and seasonal (i.e., summer and winter) peakload effects are reported on the EIA-411). **DOE Glossary of Electricity Terms]**

Inter-working reference point: A reference point at which an interface can be established to allow communication between two or more systems. An inter-working conformance requirement is stated in terms of the exchange of information between two or more systems. Inter-working conformance involves interconnection of reference points. [ISO/IEC 10746, OMG UML]

Intranet: A private network inside a company or organization that uses web technologies. Intranets may or may not have a connection also to the Internet. Sometimes

an Intranet that is connected to the Internet or allow access to outside company users; e.g., suppliers, customer, is called the Extranet.

Intranet Web Sites: Access limited to users within a single organization.

Introduction (of an <X>): Instantiating an <X> when it is not achieved by an action of objects in the model. [ISO/IEC 10746, OMG UML]

Intrusion Detection: Detection of break-ins or break-in attempts either manually via software expert systems that operate on logs or other information available on the network. Sometimes honeypots are used to lure potential hackers into revealing their presence.

Invariant: A predicate that a specification requires being true for the entire lifetime of a set of objects. [ISO/IEC 10746, OMG UML]

Invariant schema: A set of predicates on one or more information objects that must always be true. The predicates constrain the possible states and state changes of the objects to which they apply. [ISO/IEC 10746, OMG UML]

Inverter: A machine, device, or system that changes direct-current power to alternating-current power. [**IEEE P1547 Standard for Interconnecting Distributed Resources with Electric Power Systems**]

Investor-Owned Utility: A class of utility whose stock is publicly traded and which is organized as a tax-paying business, usually financed by the sale of securities in the capital market. It is regulated and authorized to achieve an allowed rate of return. **DOE Glossary of Electricity Terms]**

IP (Internet Protocol): The network-layer protocol in the TCP/IP protocol suite governing connectionless, best-effort transmission across packet-switching networks. Defined in STD 5, RFC 791.

IP Address: An address that is assigned to each computer. The normal form we see for an IP address is in the form of 4 numbers divided by 3 dots, for example, 205.243.76.2. This number specifies both the network the computer is connected to and the specific host itself. See also IPv6, where the address field is defined as 128 bits. See also Internet Address.

IP Address Classes: In IPv4, there are five groups of addresses; classes A, B, and C consist of a netid, hosted, and class ID: class D holds multicast addresses: class E is reserved for future use.

IP Broadcast: On IP networks; a packet can be directed to an individual machine or broadcast to an entire network. When a packet is sent to an IP broadcast address from a machine on the local network, that packet is delivered to all machines on that network.

When a packet is sent to that IP broadcast address from a machine outside of the local network, it is broadcast to all machines on the target network.

IP Direct Broadcast Addresses: Network addresses with the host portion of the address having all one bits. For example, the IP direct broadcast address for the network 10.0.0.0 is 10.255.255.255. Network addresses with all zeros in the host portion, such as 10.50.0.0, can also produce a broadcast response. See also IP Multicast Address.

IP Multicast Address: Class D in IP addressing (224.0.0.0 to 239.255.255.255). Used for conferencing, audio, and video.

IP Sniffing: Stealing network addresses by reading the packets. Harmful data is then sent stamped with internal trusted addresses.

IP Splicing: An attack whereby an active, established, session is intercepted and co-opted by the attacker. IP Splicing attacks may occur after an authentication has been made, permitting the attacker to assume the role of an already authorized user. Primary protections against IP Splicing rely on encryption at the session or network layer.

IP Spoofing: An attack whereby a system attempts to illicitly impersonate another system by using its IP address.

IPCP (PPP Internet Protocol Control Protocol): PPP's IP NCP protocol.

IPSec (IP Security Protocol): Rapid advances in communication technology have accentuated the need for security in the Internet. IPSec is a security protocol in the network layer that provide cryptographic security services that flexibly support combinations of authentication, integrity, access control, and confidentiality. The protocol formats for the IP Authentication Header (AH) and IP Encapsulating Security Payload (ESP) is independent of the cryptographic algorithm. The IETF has a working group developing the protocol; IPSEC.

IPv4: The Internet Protocol, version 4. It is the current version using a 32 bit address.

IPv6: The Internet Protocol, version 6. It features major IP addressing changes that would increase the available number of IP addresses by using an address length of 128 bits. IPv6_RFCs

IPX/SPX: Novell NetWare's Internet Packet Exchange/Sequenced Packet Exchange protocol suite. More...

IRC (Internet Relay Chat): A method by which multiple people can engage in discussions on the Internet at the same time IRC is the granddaddy of all the chat formats and the largest. It is text based communication. There are a number of major IRC servers around the world, which are linked to each other. Anyone can create a channel and all

others in the channel see anything that anyone types in a given channel. Private channels can (and are) created for multi-person conference calls.

ISAPI: The Microsoft Internet Information Server (IIS) includes a programming interface called the Internet Server API (ISAPI). It has library wrappers for developers who use the old-style Windows Sockets interface, and special new functions to extend the Microsoft Win32® API. ISAPI enables programmers to develop Web-based applications that run much faster than conventional CGI programs because they're more tightly integrated with the Web server. In addition to IIS, several Web servers from companies other than Microsoft support ISAPI. It also interacts with COM components.

ISDN (Integrated Services Digital Network): A medium speed, digital connection. It provides 64 kbps to 1.544 Mbps bandwidth over two channels. Like normal phone lines, it has a number, which can be dialed into, and it can dial out to any other ISDN number, unlike leased lines which are strictly point-to-point. With the proper equipment, it can act like any other phone line. Like leased lines, it provides reliable digital service that is not normally affected by line noise and other ailments that normal modems experience. See also B-ISDN (Broadband ISDN).

Island: A condition in which a portion of an Area Electric Power System (EPS) is energized solely by one or more Local EPSs through the associated Points of Common Coupling (PCCs) while that portion of the Area EPS is electrically separated from the rest of the Area EPS. **[IEEE P1547 Standard for Interconnecting Distributed Resources with Electric Power Systems]**

Island, Intentional: a planned island. **[IEEE P1547 Standard for Interconnecting Distributed Resources with Electric Power Systems]**

Island, Unintentional: an unplanned island. **[IEEE P1547 Standard for Interconnecting Distributed Resources with Electric Power Systems]**

Islanding - Independent operation of a part of the PSE that is isolated after its emergency disconnection from the rest of the system, having at least one generating unit in operation while said generating unit is able to offer power supply to customers and other generating units

ISO (Independent System Operator): a regulated entity which operates the power system in a deregulated market, but does not take part in energy trading activities, although it may operate a spot market based on regulatory rules.

ISO (The International Organization for Standardization): is a worldwide federation of national standards bodies from some 140 countries, one from each country. ISO is a non-governmental organization established in 1947. The mission of ISO is to promote the development of standardization and related activities in the world with a view to facilitating the international exchange of goods and services, and to developing cooperation in the spheres of intellectual, scientific, technological and economic activity.

ISO's work results in international agreements which are published as International Standards. http://www.iso.ch

ISOC (The Internet Society): A membership organization whose members support a worldwide information network. It is also the governing body to which the IAB reports.

Isochronicity: A sequence of actions is isochronous if every adjacent pair of actions in the sequence occupies unique, equally sized, adjacent intervals in time. [ISO/IEC 10746, OMG UML]

ISP (Internet Service Provider): An organization that provides access to the Internet as well as other Internet services such as e-mail, web hosting, ftp, chat, etc. They normally have a high speed connection with enough bandwidth to handle hundreds and even thousands of simultaneous connections into the Internet.

ISSA: Information Systems Security Association.

ITU-T: International Telecommunications Union – Telecommunication Standardization Sector is a telecommunication standards organization formerly known as the CCITT. http://www.itu.int

IXIT: Implementation eXtra Information for Testing [ISO/IEC 10746, OMG UML].

J

J2EE (Java 2 Platform, Enterprise Edition): Combines a number of technologies in one architecture with a comprehensive Application Programming Model and Compatibility Test Suite for building enterprise-class server-side applications. See also Java.

J2ME (Java 2 Platform, Micro Edition): A highly optimized Java runtime environment targeting a wide range of consumer products, including pagers, cellular phones, screen-phones, digital set-top boxes and car navigation systems.

J2SE (Java 2 Platform, Standard Edition): The essential Java 2 SDK, tools, runtimes, and APIs for developers writing, deploying, and running applets and applications in the Java programming language. Also includes earlier Java Development Kit versions JDK™ 1.1 and JRE 1.1. See also Java.

JANET (Joint Academic Network): The academic and research network in the United Kingdom.

Java: A programming language created by Sun Microsystems. It is similar to C++ (C++ without the "fangs"), but is capable of running on any computer regardless of the operating system using a Java interpreter. A web browser includes a Java interpreter.

JavaScript: A programming language, similar to Java although not the same. It is easier to write in than Java since it does not require any special software to create the script. The script can be embedded in html documents, providing dynamic web pages. JavaScript.com The JavaScript Source. See also VBScript.

JDBC (Java DataBase Connectivity): Provides programmers with a uniform interface to a wide range of relational databases, and provides a common base on which higher-level tools and interfaces can be built. JDBC is similar to ODBC, but is designed specifically for Java programs, whereas ODBC is language-independent. A JDBC-ODBC Bridge is available and part of J2SE. Developed by Sun. See also J2EE.

JDK (Java Development Kit): see J2SE.

Jitter: The slight movement of a transmission signal in time or phase; jitter can introduce errors and cause the loss of synchronization in high-speed synchronous communications.

JMS (Java Message Service): The Java Message Service specification provides developers with a standard Java API for enterprise messaging services such as reliable queuing, publish and subscribe communication and various aspects of push/pull technologies. See also J2EE.

JNDI (Java Naming and Directory Interface): Provides uniform, industry-standard, seamless connectivity from the Java platform to business information assets, thus allowing developers to deliver Java applications with unified access to multiple naming and directory services across the enterprise. See also J2EE.

Joining action: An action shared between two or more chains resulting in a single chain. [ISO/IEC 10746, OMG UML]

JPEG: Joint Photographic Experts Group. The name a group of experts nominated by national standards bodies and major companies to work to produce standards for continuous tone image coding. The 'joint' refers to its status as a committee working on both ISO and ITU-T standards. The 'official' title of the committee is ISO/IEC JTC1 SC29 Working Group 1, and is responsible for both JPEG and JBIG standards. The best known standard from JPEG is IS 10918 (ITU-T T.81), which is the first of a multi-part set of standards for still image compression. A basic version of the many features of this standard, in association with a file format placed into the public domain by C-Cube Microsystems (JFIF) is what most people think of as JPEG. JPEG is one of the 2 main image formats used on the Web, the other one is GIF.

Jscript: Microsoft scripting language. Conforms with ECMAScript. Microsoft Scripting Technologies: JScript

JSP (JavaServer Pages): JSP technology allows web developers and designers to rapidly develop and easily maintain, information-rich, dynamic web pages that leverage existing business systems. As part of the Java™ family, JSP technology enables rapid development of web-based applications that are platform independent. JSP technology separates the user interface from content generation enabling designers to change the overall page layout without altering the underlying dynamic content. JSP technology uses XML-like tags and scriptlets written in the Java programming language to encapsulate the logic that generates the content for the page. See also J2EE.

JTA (Java Transaction API): While J2EE provides transaction support automatically, the Java Transaction API (JTA) provides a way for J2EE components and clients to manage their own transactions and for multiple components to participate in a single transaction. See also J2EE.

JTS (Java Transaction Service): The Java Transaction Service (JTS) API technology ensures interoperability with sophisticated transaction resources such as transactional application programs, resource managers, transaction processing monitors and transaction managers. Since these components are provided by different vendors, JTS provides open, standard access to these transaction resources. See also J2EE.

K

K: A suffix meaning "about 1000", derived from the Greek kilo.

K56Flex: 56K modem technology from Lucent and Rockwell. See also V.90 and x2.

Kbps: A speed rating for computer modems that measures (in units of 1,024 bits) the maximum number of bits the device can transfer in one second under ideal conditions.

Kerberos: A centrally managed network-based authentication system, originally developed at MIT but used extensively around the world. Locally, it is used to authenticate users of services such as UIDirect and Bluestem.[From http://www.cites.uiuc.edu]

Kermit: A widely used asynchronous protocol.

Kernel: The level of an operating system or networking system that contains the system-level commands or all of the functions hidden from the user. This program is always running while the system is operating.

Key: In encryption, a key is a sequence of characters used to encode and decode a file. You can enter a key in two formats: alphanumeric and condensed (hexadecimal). In the network access security market, "key" often refers to the "token," or authentication tool, a device utilized to send and receive challenges and responses during the user authentication process. Keys may be small, hand-held hardware devices similar to pocket calculators or credit cards, or they may be loaded onto a PC as copy-protected, software. See also Secret Key Cryptography and Public Key Cryptography.

Key card: A card with a code written on a magnetic strip, and used primarily for access to locked doors or, increasingly, to computer systems.

Kilobyte (KB): Represents 1024 bytes.

Kilowatt (kW): One thousand watts. [**DOE Glossary of Electricity Terms]**

Kilowatthour (kWh): One thousand watt-hours. [**DOE Glossary of Electricity Terms]**

Knowbot: Knowledge robots designed to search files on the Internet "a robotic librarian." It is a registered trademark of the Corporation for National Research Initiatives.

L

L2TP: L2TP protocol is a virtual extension of PPP across IP network infrastructure. [From RFC 2888]

LAN (Local Area Network): A data communications system that (a) lies within a limited spatial area, (b) has a specific user group, (c) has a specific topology, and (d) is not a public switched telecommunications network, but may be connected to one. *Note 1:* LANs are usually restricted to relatively small areas, such as rooms, buildings, ships, and aircraft. *Note 2:* An interconnection of LANs within a limited geographical area, such as a military base, is commonly referred to as a campus area network. An interconnection of LANs over a city-wide geographical area is commonly called a metropolitan area network (MAN). An interconnection of LANs over large geographical areas, such as nationwide, is commonly called a wide area network (WAN). *Note 3:* LANs are not subject to public telecommunications regulations. [From ANSI T1.523-2001]

LAP (Link Access Procedure): A bit-oriented data link protocol derived from the HDLC. It is an earlier version of LAPB and is seldom used today.

LAPB (Link Access Procedure for B channel): A LAP protocol used in ISDN for the B channel.

LAPB (Link Access Procedure, Balanced): A LAP protocol in which stations can only function in balanced mode.

LAPD (Link Access Procedure for D channel): A LAP protocol used in ISDN for the D channel.

LAPM (Link Access Procedure for Modems): A LAP protocol defined for modems.

Last Mile: Expression used to describe the end-user connection to a WAN; i.e., between an ISP and the end-user. Traditionally this has been the main bottleneck when using modems. With newer broadband technology, it is becoming less of an issue.

LATA (Local Access and Transport Area): Under the terms of the Modification of Final Judgment (MFJ), a geographical area within which a divested Bell Operating Company (BOC) is permitted to offer exchange telecommunications and exchange access services.

Latency: The amount of time it takes for a packet to travel across a network and reach its destination. Together, latency and bandwidth define the speed and capacity of a network.

Launch: To open and run an application. You launch your web browser to view a web page.

LCP (Link Control Protocol): LCP is a PPP protocol used to negotiate the encapsulation format options, handle varying limits on sizes of packets, authenticate the identity of its peer on the link, determine when a link is functioning properly and when it is defunct, detect a looped-back link and other common misconfiguration errors, and terminate the link.

LDAP (Lightweight Directory Access Protocol): is a technology for accessing common directory information. LDAP provides an extendable architecture for centralized storage and management of information that needs to be available for today's distributed systems and service

Leased Line: A permanently connected private telephone line between two locations. Leased lines are typically used to connect a moderate-sized local network to an Internet service provider.

Liaison: The relationship between a set of objects which results from the performance of some establishing behavior; the state of having a contractual context in common. [ISO/IEC 10746, OMG UML]

Line Layer: A SONET layer responsible for the movement of a signal across a physical line.

Line Losses - marginal energy costs are estimated at the busbar, where the generation unit first connects to the transmission system. Customers take delivery at various points on the transmission and distribution system. Losses reflect energy dissipation as electricity flows through the wires, and through its transformation down to lower delivery levels. Standard rates include loss factors applicable to the various levels of delivery, transmission, subtransmission, and distribution, and for transformation losses when the customer is metered on the low voltage side of a utility owned transformer. These factors are used to mark off wholesale RTP prices to reflect the higher generation output required to delivery energy to the end-use customer.

Link Layer: Layer Two of the OSI reference model; also known as the Data Link Layer.

Link State Routing: This type of routing requires each router to maintain at least a partial map of the network. When a network link changes state (up to down, or vice versa), a notification, called a link state advertisement (LSA) is flooded throughout the network. All the routers note the change, and recompute their routing table accordingly. The cost/metric is based on number of hops, link speeds, traffic congestion, and other factors as determined by the network designer. Link state routers use Dijkstra's algorithm to calculate shortest (lowest cost) paths. Link state routing is an improvement over distance-vector routing protocols such as RIP which normally use only a single metric (such as hop count) and which exchange all of their table information with all other

routers on a regular schedule. Link state routing normally requires more processing but less transmission overhead. See also BGP.

Link: A text or image within a Web page that causes the browser to open another web page when you click it.

Links: See hyperlink.

Listserv: A program that allows groups to have discussions through e-mail, called mailing lists.

LLC (Logical Link Control): The upper sublayer of the data link layer as defined by IEEE 802.2. See also MAC.

Load (Electric): The amount of electric power delivered or required at any specific point or points on a system. The requirement originates at the energy-consuming equipment of the consumers. [**DOE Glossary of Electricity Terms]**

Load Curve - Graphic presentation of the variation of load versus time. Often aggregations of similar customers are used to estimate energy usage.

Load Schedule - Periodic sets of generation and corresponding loads.

Load-Serving Entity: an entity that provides or arranges for serving the electrical demand and energy requirements of its customers. (NERC "*Terms and Their Definitions As Used in the NERC Planning Standards*")

Load Shedding - Manual or automatic shedding of customer loads, usually triggered by emergency conditions, such as when the frequency has dropped below a specific percentage of nominal, resulting from the capacity deficit in the power system.

LocalTalk: Is a cabling scheme offering a plug-and-play network solution that could transmit data at 234 kb/s. Compare with Ethernet.

Location in space: An interval of arbitrary size in space at which an action can occur. [ISO/IEC 10746, OMG UML]

Location in time: An interval of arbitrary size in time at which an action can occur. [ISO/IEC 10746, OMG UML]

Location transparence: A distribution transparency which masks the use of information about location in space when identifying and binding to interfaces. [ISO/IEC 10746, OMG UML]

Logging: The process of storing information about events that occurred on the firewall or network.

Logical Device Model: A Logical Device model is the entity which is connected to the communications network. It contains one or more Physical Device models.

Logical Unit: concept used in IEC 61850 for grouping object models into useful blocks. In UCA, Logical Units were referred to as Bricks.

Login: An opening procedure to identify yourself to a system as a legitimate user and begin a session. To log in you usually need a valid user name and password that were preassigned by the system administrator of the system.

Logout: A closing procedure to formally end a session with a system.

Loopback: A diagnostic procedure used for transmission devices. A test message is sent to a device being tested. The message is then sent back to the originator and compared with the original transmission. Loopback testing may be performed with a locally attached device or conducted remotely over a communications circuit.

M

MAC (Media Access Control): A media-specific access control protocol within IEEE 802 specifications; currently includes variations for Token Ring, token bus, and CSMA/CD. It is IEEE's lower sublayer of the OSI link layer. See also Logical Link Control (LLC).

MAC Address: The 48-bit address block of a device used at the data link layer. See MAC. Ethernet hardware addresses are 48 bits, expressed as 12 hexadecimal digits (0-9, plus A-F, capitalized). These 12 hex digits consist of the first/left 6 digits (which should match the vendor of the Ethernet interface within the station) and the last/right 6 digits which specify the interface serial number for that interface vendor. These high-order 3 octets (6 hex digits) are also known as the Organizationally Unique Identifier or OUI. Ethernet addresses should be written hyphenated by octets (e.g., 12-34-56-78-9A-BC). These addresses are physical station addresses, not multicast nor broadcast, so the second hex digit (reading from the left) will be even, not odd. The IEEE assigns Ethernet block addresses. Ethernet numbers at IANA.

Mail Gateway: A machine that connects to two or more electronic mail systems (especially dissimilar mail systems on two different networks) and transfers mail messages among them.

Mail Path: A series of machine names used to direct electronic mail from one user to another.

Mail Reflector: A special mail address; electronic mail sent to this address is automatically forwarded to a set of other addresses. Typically, used to implement a mail discussion group.

Mailing List: A possibly moderated discussion group, distributed via email from a central computer maintaining the list of people involved in the discussion.

MAN (Metropolitan Area Network): is a network that interconnects users with computer resources in a geographic area or region larger than that covered by even a large local area network (LAN) but smaller than the area covered by a wide area network (WAN). It is also used to mean the interconnection of several local area networks by bridging them with backbone lines. The latter usage is also sometimes referred to as a campus network.

Managed role: The view of the management interface of an object that is being managed within an ODP system. [ISO/IEC 10746, OMG UML]

Management Information Library: A document containing the specification of all defined managed objects and a complete description of their behavior. Development of

this library is currently being proposed by groups such as the NIST OSI Implementers' Workshop Group.

Management Information: 1. The set of managed objects in a system, together with their attributes, constitutes that system's management information base. It is a conceptual repository of management information at each system. 2. Knowledge concerning objects which are of relevance to management. [ISO/IEC 10746, OMG UML]

Managing role: The view of an object which is performing managing actions. [ISO/IEC 10746, OMG UML]

Marginal Capacity Cost (MCC) - measures the cost of capacity associated with the unit that would be added, or the resources rights that would be purchased, to serve incremental load. MCC usually is measured in reference to additions to system peak loads, in terms of dollar per kilowatt of additional capacity added.

Marginal Energy Cost (MEC) - the variable generation operating cost incurred to serve an incremental unit of load, or the cost saved from an increment in load reduction. Convention measures energy costs in dollars per kilowatt-hours. As a marginal measure, its level is dependent upon the load level from which the increment is measured, and the size of the increment. In its strictest interpretation, the increment is one kW(h). In practice, the models and methods employed to estimate or measure MEC require a larger increment of load change, often as large as 10 megawatts, more which exceeds the total load of all but a few customers. Therefore, MEC is an illustrative and generic measure that in practice cannot be associated directly with the actions of any one customer. The point on the demand for electricity curve where MEC is measured is a function of the purpose at hand. For RTP, that measurement is taken at the level of wholesale and retail load forecast to be on line in the hour in which prices are being set.

Marginal Outage Costs (MOC) - the change in outage costs associated with a change in load, at some specified load level and at a given load increment. For RTP, the increment is usually set at the maximum level of load change that RTP subscribers are likely to undertake in response to RTP prices, although in practice minimum increments required by models used to measure MOC are larger than these increments.

Market-Based Pricing: Electric service prices determined in an open market system of supply and demand under which the price is set solely by agreement as to what a buyer will pay and a seller will accept. Such prices could recover less or more than full costs, depending upon what the buyer and seller see as their relevant opportunities and risks. [**DOE Glossary of Electricity Terms]**

Market Clearing Price (MCP): The price at which supply equals demand for the Day Ahead and/or Hour Ahead Markets. [**DOE Glossary of Electricity Terms]**

Market Participant: A participant in the electric or gas marketplace, either as a

purchaser, seller, broker, or implementer of energy trades, ancillary services trades, and transmission access trades.

Market Schedule: A schedule of energy to be delivered and/or received at specific points on the transmission system. Market Schedules are not necessarily balanced schedules. They are communicated between Market Participants and Market Operators. Examples from the SMD NOPR include Self-Schedules, Bilateral Transaction Schedules, and schedules from the Day-Ahead and Real-Time Markets for Energy and Ancillary Services.

MAS (Multiple Address Radio System): is usually configured as a master radio and multiple slave radios.

Masquerade: Masquerade is a security term in which an entity (person or system) pretends to be a different entity and thereby gains the other person's privileges. Masquerade is one of the most common security attacks, in which a hacker learns someone else's password, logs in with that person's privileges, and is therefore free to undertake any number of security attacks such as eavesdropping, modifying data, denying access to data, or using data illegitimately.

Master/Slave: Communication management scheme called polling in which one system (the Master) requests one of a group of IEDs (Slaves) to deliver specified information. Only Masters, not Slaves, may issue unsolicited data or commands. Used where data flows primarily between the Slaves and the Master. Quiescent reporting schemes use an implied initial data request solicitation by the Master. Often these terms are used interchangeably with Client/Server, although there are differences: a system may be a Client in one transaction and a Server in another transaction. Masters are always masters; slaves are always slaves.

Medium: The material used to support transmission of data. This can be copper wire, coaxial cable, optical fiber, or electromagnetic waves (as in microwaves).

Medium Voltage (MV) - Voltage that is higher than 1 kV and lower than 110 kV. This term is used extensively in Europe and other countries, but less frequently in the US.

Megabit (Mb, Mbit): 1,000,000 bits; used in describing data transfer rates as a function of time (Mbps). See bit.

Megabyte (Mbyte, MB, Meg, or M): 1,048,576 bytes, equal to 1024 kilobytes.

Megawatt (MW): One million watts. [**DOE Glossary of Electricity Terms]**

Megawatthour (MWh): One million watt-hours. [**DOE Glossary of Electricity Terms]**

Meta: Meta is a prefix that in most information technology usages means "an underlying definition or description." Thus, metadata is a definition or description of data and meta-language is a definition or description of language. Meta derives from Greek, meaning "among, with, after, change." Whereas in some English words the prefix indicates "change" (for example, metamorphosis), in others, including those related to data and information, the prefix carries the meaning of "more comprehensive or fundamental."

The Standard Generalized Markup Language (SGML) defines rules for how a document can be described in terms of its logical structure (headings, paragraphs or idea units, and so forth). SGML is often referred to as a meta-language because it provides a "language for how to describe a language." A specific use of SGML is called a document type definition (DTD). A document type definition spells out exactly what the allowable language is. A DTD is thus a meta-language for a certain type of document. (In fact, the Hypertext Markup Language (HTML) is an example of a document type definition. HTML defines the set of HTML tags that any Web page can contain.)

The eXtensible Markup Language (XML), which is comparable to SGML and modeled on it, can be used to describe how to describe a collection of data. It's sometimes referred to as metadata. In the case of SGML and XML, "meta" connotes "underlying definition" or set of rules. In other usages, "meta" seems to connote "description" rather than "definition." For example, the HTML tag is used to enclose descriptive language about an HTML page. One could describe any computer programming or user interface as a meta-language for conversing with a computer. And an English grammar and dictionary together could be said to define (and describe) the meta-language for spoken and written English.

Meta-Model: The data that describes data; in other words, a meta-model is a model of data elements that describes what they are, what their name is, how they relate to each other, what transfer format they may use, and other information about the data. Meta-models may be written on paper, or implemented electronically, often using the web technology of XML. See Meta.

Meter Data Management Agents (MDMA): An entity, either within a utility or a separate company, that has the mandate to collect, manage, and process metering data for utilities.

Metering System - Set of equipment, installations, and programs that facilitate automatic collection and processing of the metering data.

MIB (Management Information Base): is a formal description of a set of network objects that can be managed using the Simple Network Management Protocol (SNMP). The format of the MIB is defined as part of the SNMP. (All other MIBs are extensions of this basic management information base.) SNMPv3 provides for defining MIBs using object models, and thus allows new MIBs to be easily defined. Product developers can create and register new MIB extensions.

Microsoft Internet Explorer: The web browser Microsoft has produced. It has been installed on all Windows based computers for a year or so. It has become so integrated into the Windows operating system that it is difficult to remove without causing harm to the operating system.

Middleware: The concept of middleware comes from the location in a software architecture where it resides. It is between something - in the middle. The something could be a database and a user interface or the messaging between a network and applications, but could also be other parts where an intermediate entity is needed. Hence, the middleware definition is not exact, it has to be used in context with something and depends on who is providing the definition. Another term often used together with middleware is Enterprise Application Integration (EAI).

Migration: Moving a cluster to a different capsule. [ISO/IEC 10746, OMG UML]

Migration transparency: A distribution transparency which masks, from an object, the ability of a system to change the location of that object. Migration is often used to achieve load balancing and reduce latency. [ISO/IEC 10746, OMG UML]

MILNET: One of the DDN networks that make up the Internet; devoted to non-classified military (U.S.) communications. It was built using the same technology as the ARPAnet, and remained in production when the ARPAnet was decommissioned.

MIME (Multipurpose Internet Mail Extension): Originally designed for e-mail, as an encoding method for sending non-ASCII files through e-mail servers, MIME has been adopted as a way to also send non-html documents over the World Wide Web. MIME provides a way for non-text information to be encoded as text. This encoding is known as base64. Web servers now must be configured for MIME types to serve those types of files. Most mail clients automatically handle MIME now and the process is transparent to the user. Defined in RFC2045, RFC2046, RFC2047, RFC2048, and RFC2049. A supplement to SMTP.

Mirror: Mirrors are exact copies of an original site on the Internet. Mirrors are primarily used for ftp sites although many web sites are also now being mirrored. Mirroring helps distribute traffic among multiple servers so as not to overwhelm the primary.

MLM: Multi-Level Marketing

MMDS (Multipoint Microwave Distribution System): also know as Multi-channel Multi-point Distribution System and wireless cable, is a wireless broadband technology for Internet Access. MMDS channels come in 6 MHz chunks and runs on licensed and unlicensed channels. Each channel can reach transfer rates as high as 27Mbps (over unlicensed channels: 99MHz, 2.4GHz, and 5.7 to 5.8GHz) or 1Gbps (over licensed channels). MMDS is a line-of-sight service

MMF: Make Money Fast

MMS: Manufacturing Message Specification

Modem (MOdulator-DEModulator): A device used to convert serial digital data from a transmitting terminal to an analog signal suitable for transmission over a telephone channel, or to reconvert the transmitted analog signal to serial digital data for acceptance by a receiving terminal.

Modem Speed: The theoretical amount of data that can be transferred. Modem speeds were originally stated in baud rates but that term became outdated with newer technology so now the speeds are referred to in bps or kbps. Because of various conditions, the maximum modem speed is rarely achieved, especially at the higher 33.6kbps and 56kbps speeds.

MOF (Meta-Object Facility): is a standardized repository for meta-data; i.e., the descriptions and definitions of the fundamental concepts that applications work with. It is a place to store UML models, but useful for other metadata too - such as the definitions of data types in your data warehouse. See also UML and CORBA.

Moore's Law: The observation, made in 1965 by Intel co-founder Gordon Moore while preparing a speech, that each new memory integrated circuit contained roughly twice as much capacity as its predecessor, and each chip was released within 18-24 months of the previous chip. If this trend continued, he reasoned, computing power would rise exponentially with time.[From computing-dictionary.thefreedictionary.com]

Mosaic: The original web browser, developed at NCSA. It is still the basis for many web browsers today and almost all web browsers still follow the same characteristics that Mosaic established.

MPEG (Motion Picture Experts Group): A working group of ISO/IEC in charge of the development of international standards for compression, decompression, processing, and coded representation of moving pictures, audio and their combination.

MSMQ (Microsoft Message Queuing): is a messaging system providing guaranteed message delivery, efficient routing, security, and priority-based messaging. It can be used to implement solutions for both asynchronous and synchronous scenarios requiring high performance.

MTA: message transfer agent (MTA): An OSI application process used to store and forward messages as described in the X.400 message handling system. [Bahorsky] Synonym Internet mail agent.[From ANSI T1.523-2001]

MTS (Microsoft Transaction Server): formerly known by its code name, "Viper"—combines the features of a Transaction Processing monitor and an Object Request Broker. It is the transaction service in the Windows NT® operating system.

Multicast: Simultaneous transmission of data to a defined group of destinations on a network.

Multimedia: The combination of multiple forms of communications including text, graphics, and sound.

Multiplex: The division of a single transmission medium into multiple logical channels supporting many simultaneous sessions.

Multiprotocol Label Switching (MPLS): MPLS is a standards-approved technology for speeding up network traffic flow and making it easier to manage. MPLS involves setting up a specific path for a given sequence of packets, identified by a label put in each packet, thus saving the time needed for a router to look up the address to the next node to forward the packet to. MPLS is called *multiprotocol* because it works with the Internet Protocol (IP), Asynchronous Transport Mode (ATM), and frame relay network protocols. With reference to the standard model for a network (the Open Systems Interconnection, or OSI model), MPLS allows most packets to be forwarded at the layer 2 (switching) level rather than at the layer 3 (routing) level. In addition to moving traffic faster overall, MPLS makes it easy to manage a network for quality of service (QoS). For these reasons, the technique is expected to be readily adopted as networks begin to carry more and different mixtures of traffic. [WhatIs.com]

N

NAK (Negative Acknowledgement): A message sent to indicate the rejection of received data.

Name: A term which, in a given naming context, refers to an entity. [ISO/IEC 10746, OMG UML]

Name resolution: The process by which, given an initial name and an initial naming context, an association between a name and the entity designated by the initial name can be found. [ISO/IEC 10746, OMG UML]

Name space: A set of terms usable as names. [ISO/IEC 10746, OMG UML]

Naming action: An action that associates a term from a name space with a given entity. [ISO/IEC 10746, OMG UML]

Naming context: A relation between a set of names and a set of entities. The set of names belongs to a single name space. [ISO/IEC 10746, OMG UML]

Naming domain: A subset of a naming context such that all naming actions are performed by the controlling object of the domain (the name authority object). [ISO/IEC 10746, OMG UML]

Naming graph: A directed graph where each vertex denotes a naming context, and where each edge denotes an association between a name appearing in the naming context, and the target-naming context. [ISO/IEC 10746, OMG UML]

NAP (Network Access Point) - See Peering Point.

NAT: Short for *Network Address Translation*, an Internet standard that enables a local-area network (LAN) to use one set of IP addresses for internal traffic and a second set of addresses for external traffic. A *NAT box* located where the LAN meets the Internet makes all necessary IP address translations.

NAT serves three main purposes:

- ? Provides a type of firewall by hiding internal IP addresses
- ? Enables a company to use more internal IP addresses. Since they're used internally only, there's no possibility of conflict with IP addresses used by other companies and organizations.
- ? Allows a company to combine multiple ISDN connections into a single Internet connection.

[From www.webopedia.com]

NCP (Network Control Protocol): PPP set of control protocols handling the encapsulation of data coming from network layer protocols; e.g., IP, IPX, and AppleTalk, in the PPP frame. The IP version is called IPCP.

NCSA (National Center for Supercomputing Applications): An organization headquartered at the University of Illinois. Researchers there created among other things, the Mosaic browser and one of the early web servers called httpd. http://www.ncsa.uiuc.edu

NERC (North American Electric Reliability Council): NERC operates as a voluntary organization to promote bulk electric system reliability and security - one dependent on reciprocity, peer pressure, and the mutual self-interest of all those involved. Through this model, NERC has helped to make the North American electric system the most reliable system in the world. In promoting electric system reliability and security, NERC:

- establishes operating policies and planning standards to ensure electric system reliability.
- reviews the reliability of existing and planned generation and transmission systems.
- critiques past electric system disturbances for lessons learned and monitors the present for compliance and conformance to its policies.
- educates others about how bulk electric systems operate.
- maintains liaisons with the federal, state, and provincial governments in the United States and Canada and electricity supply industry organizations in both countries.
- serves as the electric industry's primary point of contact with the federal government on issues relating to national security and terrorism.

.NET: is Microsoft's platform for XML Web services. XML Web services allow applications to communicate and share data over the Internet, regardless of operating system or programming language. The platform includes a comprehensive family of products, built on XML and Internet industry standards, that provide for each aspect of developing, managing, using, and experiencing XML Web services.

NetBEUI: (NetBios Extended User Interface) A network, transport, and session layer protocol. NetBEUI was originally designed by IBM for their LAN Manager server and later extended by Microsoft and Novell. NetBEUI is the best performance and security choice for communication within a single LAN. Because, like NetBIOS, it does not support the routing of messages to other networks. See NetBIOS.

NetBIOS (Network Basic Input/Output System): An applications programming interface (API) which activates network operations on IBM PC compatibles running under Microsoft's DOS. See NetBEUI.

Net Capability: The maximum load-carrying ability of the equipment, exclusive of station use, under specified conditions for a given time interval, independent of the characteristics of the load. (Capability is determined by design characteristics, physical conditions, adequacy of prime mover, energy supply, and operating limitations such as cooling and circulating water supply and temperature, headwater and tailwater elevations, and electrical use.) [**DOE Glossary of Electricity Terms]**

Net Generation: Gross generation minus plant use from all electric utility owned plants. The energy required for pumping at a pumped-storage plant is regarded as plant use and must be deducted from the gross generation. [**DOE Glossary of Electricity Terms]**

Netiquette: Short for Internet etiquette, it is almost an unwritten group of ideas of how people should interact with one another on the Internet. For example, netiquette says that you should not send spam.

Netizen: A person who is on the Internet. This term is normally reserved for those who follow good netiquette.

Netscape Communicator (Navigator): One of the most popular web browsers available. It was written in part by one of the original authors of Mosaic, Marc Andreessen who is one of the founders of Netscape Communications.

Network - The connection of two or more devices which communicate using network protocols such as **NAP (Network Access Point)**: See Peering Point.

Network Address Translation (NAT): A NAT operates on a router connecting two networks together; one of these networks (designated as inside) is addressed with either private or obsolete addresses that need to be converted into legal addresses before packets are forwarded onto the other network (designated as outside). The translation operates in conjunction with routing, so that NAT can simply be enabled on a customer-side Internet access router when translation is desired. The goal of NAT is to provide functionality as if the private network had globally unique addresses and the NAT device was not present.

Network Layer: Layer 3 in the OSI model; the logical network entity that services the transport layer; responsible for ensuring that data passed to it from the transport layer is routed and delivered through the network.

Network constraints - Maximum admissible and minimum necessary generation of the power in the particular node or in the particular area, or the maximum admissible transmission of power through the given network section, including that concerning the power exchange with the foreign countries, taking into account the on-going operating conditions found in the PPS

Network Disturbance - An event that trips-out from synchronous operation a part of a power system which generates or sinks the electric energy in volumes that do not exceed a certain percentage, such as 5%, of the total ongoing generation.

Network Layer - Layer 3 in the OSI model ; the logical network entity that services the transport layer; responsible for ensuring that data passed to it from the transport layer is routed and delivered through the network.

Network Topology: The physical and logical relationship of nodes on a network (e.g., star, ring, bus etc.).

Network Worm: A program or command file that uses a computer network as a means for adversely affecting a system's integrity, reliability or availability, A network worm may attack from one system to another by establishing a network connection. It is usually a self-contained program that does not need to attach itself to a host file to infiltrate network after network.

Network: The connection of two or more devices which communicate using network protocols such as TCP/IP.

Network-Level Firewall: A firewall in which traffic is examined at the network protocol packet level.

Newbie: A new or inexperienced user of the Internet.

Newsgroup: A discussion group that communicates through a server where the messages are stored. The most common source for newsgroups is Usenet although private newsgroup servers are available and are used in an intranet setting.

Newsreader: A client application that accesses a newsgroup server and allows the user to read the articles contained therein.

NFS: Network File System is a distributed file system protocol originally developed by Sun Microsystems and defined in RFC3010. See also FTP, HTTP.

NIC (Network Interface Card): An electronic device, internal or external to a station, that contains circuitry to enable the station to be connected to a network.

NIST: National Institute of Standards and Technology is a non-regulatory federal agency within the U.S. Commerce Department's Technology Administration. NIST's mission is to develop and promote measurement, standards, and technology to enhance productivity, facilitate trade, and improve the quality of life. http://www.nist.gov

NNTP: Network News Transport Protocol is the protocol that a newsreader uses to communicate with the news server.

Node: 1. An addressable communication device on a network. 2. A configuration of engineering objects forming a single unit for the purpose of location in space, and which embodies a set of processing, storage and communication functions. [ISO/IEC 10746, OMG UML]

Noncoincidental Peak Load: The sum of two or more peakloads on individual systems that do not occur in the same time interval. Meaningful only when considering loads within a limited period of time, such as a day, week, month, a heating or cooling season, and usually for not more than 1 year. [**DOE Glossary of Electricity Terms]**

Non-Firm Power: Power or power-producing capacity supplied or available under a commitment having limited or no assured availability. [**DOE Glossary of Electricity Terms]**

Non-Repudiation: Security service that prevents an entity involved in a data exchange from denying that it participated in the exchange.

Non-utility Power Producer: A corporation, person, agency, authority, or other legal entity or instrumentality that owns electric generating capacity and is not an electric utility. Nonutility power producers include qualifying cogenerators, qualifying small power producers, and other nonutility generators (including independent power producers) without a designated franchised service area, and which do not file forms listed in the Code of Federal Regulations, Title 18, Part 141. [**DOE Glossary of Electricity Terms]**

Notification: An interaction initiated by an object operating in a managed role. [ISO/IEC 10746, OMG UML]

Normal Network Operating Condition of the Power System - Operating conditions of the power system where the values of the system parameters remain within the admissible limits.

NSAPI: is the Netscape Server API, a mechanism for extending the functionality of the Netscape servers. Through the provided API, programmers can create loadable binary modules to add or replace elements such as authentication, authorization, error logging, or content generation. More information on the NSAPI can be found at NSAPI Programmer's Guide and as part of the DevCon proceedings. Google Directory.

Nucleus: An engineering object that coordinates processing, storage and communications functions for use by other engineering objects within the node to which it belongs. [ISO/IEC 10746, OMG UML]

Nyquist theorem: A theorem that states that the number of samples needed to adequately represent an analog signal is equal to twice the highest frequency of the original signal.

O

OAG (Open Applications Group): The Open Applications Group is a non-profit consortium focusing on best practices and processes based on XML content for eBusiness and Application Integration. The OAG comprises many of the most prominent stakeholders in the business software interoperability industry throughout the world. It was formed in February of 1995 as a nonprofit consortium of leading enterprise application software developers, making it one of the earliest post-EDI organizations. Since that time, the organization has embraced customers, systems integrators, and integration enabling software vendors to work with the application software vendors to ensure that all of the stakeholders that are required to achieve it's goals are welcome and part of the solution. They build industry consensus for business software application interoperability and have developed a repeatable process for quickly developing high quality business content and XML representations of that content.

OASIS (Open Access Same-Time Information System): a system mandated by FERC for the use of Market Participants to buy and sell power system transmission products, such as Available Transmission Capacity (ATC). Transmission Customers can access it via the Internet.

OASIS (Organization for the Advancement of Structured Information Standards), is a non-profit, international consortium whose goal is to promote the adoption of product-independent standards for information formats such as Standard Generalized Markup Language (SGML), Extensible Markup Language (XML), and Hypertext Markup Language (HTML). Currently, OASIS (formerly known as SGML Open) is working to bring together competitors and industry standards groups with conflicting perspectives to discuss using XML as a common Web language that can be shared across applications and platforms. OASIS sponsors XML.org , a non-profit XML Web portal. The goal of OASIS is not to create structured information standards for XML, but to provide a forum for discussion, to promote the adoption of interoperability standards, and to recommend ways members can provide better interoperability for their users. OASIS has worked with the United Nations to sponsor ebXML, a global initiative for electronic business data exchange. EbXML, whose goal is to make it easier for companies of all sizes and locations to conduct business on the Internet, is currently focusing on the specific needs of business-to-business (B2B) and Internet security as it relates to XML. Web site.

Object: 1. An object is a "black box" which receives and sends messages. The black box contains code (sequences of computer instructions) and data (information which the instructions operates on). A primary rule of object-oriented programming is as the user of an object, one should never need to peek inside the box. Instead all communication to an object is done via messages. This concept is referred to as information hiding or encapsulation. An object is defined via its class, which determines everything about an

object. Objects are individual instances of a class. 2. A model of an entity. An object interacts with its environment at its interaction points. [ISO/IEC 10746, OMG UML]

Object Model: An object model is a specialized grouping of associated "black boxes", which models actual field devices, functions, or applications. It is usually used interchangeably with the phrase Data Model or, for utilities, Device Model. An object model is a model of a device function or application that receives control commands, setting changes, and indication data from other objects. The object model maintains relevant data, such as configuration parameters, settings, and indication data. It also outputs control commands and indication data. Object models are the result of the process of data modeling.

Object-Oriented Programming: A revolutionary concept that changed the rules in computer program development, object-oriented programming (OOP) is organized around "objects" rather than "actions," data rather than logic. Historically, a program has been viewed as a logical procedure that takes input data, processes it, and produces output data. The programming challenge was seen as how to write the logic, not how to define the data. Object-oriented programming takes the view that what we really care about are the objects we want to manipulate rather than the logic required to manipulate them. Examples of objects range from human beings (described by name, address, and so forth) to buildings and floors (whose properties can be described and managed) down to the little widgets on your computer desktop (such as buttons and scroll bars).

Objective: Practical advantage or intended effect, expressed as preferences about future states. [ISO/IEC 10746, OMG UML]

Obligation: A prescription that a particular behavior is required. An obligation is fulfilled by the occurrence of the prescribed behavior. [ISO/IEC 10746, OMG UML]

OC (Optical Carrier): A SONET rate of n times 51.84 Mbps.

OC-12: SONET rate of 622.080 Mbps.

OC-192: SONET rate of 9953.280 Mbps.

OC-3: SONET rate of 155.520 Mbps.

OC-48: SONET rate of 2488.320 Mbps.

Octet: In packet-switched networks, a grouping of 8 bits.

ODBC (Open DataBase Connectivity): is an application programming interface (API) for database access. It is based on the Call-Level Interface (CLI) specifications from X/Open and ISO/IEC for database APIs and uses SQL as its database access language. Microsoft developed standard.

ODP (Open Distributed Processing): The Reference Model for Open Distributed Processing (RM-ODP) was standardized by the ISO/IEC in the 1995/1996 timeframe. International Standard ISO/IEC 10746-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, Information technology, Subcommittee SC 33, Distributed application services, in collaboration with ITU-T. The identical text is published as ITU-T Recommendation X.901. The objective of ODP standardization is the development of standards that allow the benefits of distribution of information processing services to be realized in an environment of heterogeneous IT resources and multiple organizational domains. This comprises the provision of infrastructure components and functions that accommodate difficulties inherent in the design and programming of distributed systems.

Off-line: Not connected to a network such as the corporate LAN or the Internet.

OGSA: The Open Grid Services Architecture (OGSA) represents an evolution towards a Grid system architecture based on Web services concepts and technologies. [From www.globus.org/ogsa]

OLE (Object Linking and Embedding): A set of APIs to create and display a (compound) document. OLE is Microsoft's framework for a compound document technology. Briefly, a compound document is something like a display desktop that can contain visual and information objects of all kinds: text, calendars, animations, sound, motion video, 3-D, continually updated news, controls, and so forth. Each desktop object is an independent program entity that can interact with a user and also communicate with other objects on the desktop. Part of Microsoft's ActiveX technologies, OLE takes advantage and is part of a larger, more general concept, the COM and its distributed version, DCOM. An OLE object is necessarily also a component (or COM object).

OMG (The Object Management Group): was founded in April 1989 by eleven companies, including 3Com, American Airlines, Canon, Data General, Hewlett-Packard, Philips Telecommunications, Sun Microsystems and Unisys Corporation. In October 1989, the OMG began independent operations as a not-for-profit corporation. Today the consortium includes about 800 members. The OMG is moving forward in establishing CORBA as the "Middleware that's Everywhere" through its worldwide standard specifications. http://www.omg.org.

OMS (Outage Management System): supports the detection and management of outages affecting the distribution system.

One-Banana Problem: A measure of difficulty of a problem. A one-banana problem is simple, whereas a three-banana problem is fairly difficult. This term derives from large computer organizations where the programmers & engineers claim that the computer operators could be monkeys.

Online: Being actively connected to a network such as the Internet.

Online Certificate Status Protocol (OCSP): OCSP is one of two common schemes for maintaining the security of a server and other network resources. The other, older method, which OCSP has
superseded in some scenarios, is known as Certificate Revocation List (CRL). OCSP overcomes the chief limitation of CRL: the fact that updates must be frequently dowloaded to keep the list current at the client end. When a user attempts to access a server, OCSP sends a request for certificate status information. The server sends back a response of "current", "expired," or "unknown." The protocol specifies the syntax for communication between the server (which contains the certificate status) and the client application (which is informed of that status). OCSP allows users with expired certificates a grace period, so they can access servers for a limited time before renewing.

Online Services: A dial-up service that provides news, information, and discussion forums for users with modem-equipped PCs and the access software provided by the service. Online services may provide a gateway to the Internet but their services are not normally available to anyone that does not subscribe to their service, making it proprietary.

Ontology: In its general meaning, ontology is the study or concern about what kinds of things exist - what entities there are in the universe. It derives from the Greek onto (being) and logia (written or spoken discourse). It is a branch of metaphysics, the study of first principles or the essence of things. In information technology, an ontology is the working model of entities and interactions in some particular domain of knowledge or practices, such as electronic commerce or "the activity of planning." In this usage, an ontology is a set of concepts - such as things, events, and relations - that are specified in some way (such as specific natural language or an object modeling language) in order to create an agreed-upon vocabulary for exchanging information. [WhatIs.com] The Common Information Model (CIM) is an ontology of the entities and interactions within the electric power system domain.

OPC Foundation: The OPC Foundation has developed the OPC Specification, which is a non-proprietary technical specification that defines a set of standard interfaces based upon Microsoft's OLE/COM technology. The application of the OPC standard interface makes possible interoperability between automation/control applications, field systems/devices and business/office applications. See OPC Foundation.

Open Access: A regulatory mandate to allow others to use a utility's transmission and distribution facilities to move bulk power from one point to another on a nondiscriminatory basis for a cost-based fee. [**DOE Glossary of Electricity Terms]**

Open System: A model that allows two different systems to communicate regardless of their underlying architecture.

Open Systems Interconnection--Reference Model (OSI--RM): An abstract description of the digital communications between application processes running in distinct systems. The model employs a hierarchical structure of seven layers. Each layer performs value-

added service at the request of the adjacent higher layer and, in turn, requests more basic services from the adjacent lower layer:

- **Physical Layer:** Layer 1. The lowest of seven hierarchical layers. The Physical layer performs services requested by the Data Link Layer. The major functions and services performed by the physical layer are: (a) establishment and termination of a connection to a communications medium; (b) participation in the process whereby the communication resources are effectively shared among multiple users, *e.g.*, contention resolution and flow control; and, (c) conversion between the representation of digital data in user equipment and the corresponding signals transmitted over a communications channel.
- **Data Link Layer:** Layer 2. This layer responds to service requests from the Network Layer and issues service requests to the Physical Layer. The Data Link Layer provides the functional and procedural means to transfer data between network entities and to detect and possibly correct errors that may occur in the Physical Layer. *Note:* Examples of data link protocols are HDLC and ADCCP for point-to-point or packet-switched networks and LLC for local area networks.
- **Network Layer:** Layer 3. This layer responds to service requests from the Transport Layer and issues service requests to the Data Link Layer. The Network Layer provides the functional and procedural means of transferring variable length data sequences from a source to a destination via one or more networks while maintaining the quality of service requested by the Transport Layer. The Network Layer performs network routing, flow control, segmentation/desegmentation, and error control functions.
- **Transport Layer:** Layer 4. This layer responds to service requests from the Session Layer and issues service requests to the Network Layer. The purpose of the Transport Layer is to provide transparent transfer of data between end users, thus relieving the upper layers from any concern with providing reliable and cost-effective data transfer.
- **Session Layer:** Layer 5. This layer responds to service requests from the Presentation Layer and issues service requests to the Transport Layer. The Session Layer provides the mechanism for managing the dialogue between end-user application processes. It provides for either duplex or half-duplex operation and establishes checkpointing, adjournment, termination, and restart procedures.
- **Presentation Layer:** Layer 6. This layer responds to service requests from the Application Layer and issues service requests to the Session Layer. The Presentation Layer relieves the Application Layer of concern regarding syntactical differences in data representation within the end-user systems. *Note:* An example of a presentation service would be the conversion of an EBCDIC-coded text file to an ASCII-coded file.
- **Application Layer:** Layer 7, the highest layer. This layer interfaces directly to and performs common application services for the application processes; it also issues requests to the Presentation Layer. The common application services provide semantic conversion between associated application processes. *Note:* Examples of common application services of general interest include the virtual file, virtual terminal, and job transfer and manipulation protocols.

[T1 Glossary 2000: Glossary of Telecommunications Terms]

Operating Day - A period from 00:00 hrs. to 24:00 hrs. when the schedules of operation of the grid and the generating units are implemented.

Operating Reserve: additional output from power stations or the reduction in demand, which must be realisable in real-time operation to respond in order to contribute to containing and correcting any system frequency fall to an acceptable level in the event of a loss of generation or a loss of import from an external interconnection or mismatch between generation and demand. [IEC_Glossary_1929b.pdf]

Operating System (OS): The foundation software of a machine. The software that schedules tasks, allocates memory, disk storage, and presents an interface to the user. See Windows and UNIX.

Operation: An interaction between a client object and a server object which is either an interrogation or an announcement. [ISO/IEC 10746, OMG UML]

Operation interface: An interface in which all the interactions are operations. [ISO/IEC 10746, OMG UML]

Operation interface signature: An interface signature for an operation interface. An operation interface signature comprises a set of announcement and interrogation signatures as appropriate, one for each operation type in the interface, together with an indication of causality (client or server, but not both) for the interface as a whole, with respect to the object which instantiates the template. [ISO/IEC 10746, OMG UML]

OS: see Operating System.

OSI Reference Model (Open Systems Interconnection Reference Model): A seven-layer model for data communication defined by the ISO. The Open Systems Interconnection (OSI) is a standard reference model for communication between two end users in a network. It is used in developing products and understanding networks. The OSI reference model was developed by the ISO in 1984, and it is now considered the primary architectural model for inter-computer communications. The OSI Reference Model consists of seven layers. The top three layers (session, presentation, and application) are primarily of concern when building distributed applications programs using the **services** provided by the network. They are generally implemented only in software. The data transport aspects are covered with the **protocols** operating at the bottom four layers (physical, data link, network, and transport) in the OSI reference model. Information being transferred from a software application in one computer system to a software application in another must pass through each of the OSI layers.

Open Systems Interconnection--Reference Model (OSI--RM): An abstract description of the digital communications between application processes running in distinct systems. The model employs a hierarchical structure of seven layers. Each layer performs value-

added service at the request of the adjacent higher layer and, in turn, requests more basic services from the adjacent lower layer. The layers can be summarized as follows:

- **Physical Layer:** Layer 1. The lowest of seven hierarchical layers. The Physical layer performs services requested by the Data Link Layer. The major functions and services performed by the physical layer are: (a) establishment and termination of a connection to a communications medium; (b) participation in the process whereby the communication resources are effectively shared among multiple users, *e.g.*, contention resolution and flow control; and, (c) conversion between the representation of digital data in user equipment and the corresponding signals transmitted over a communications channel.
- **Data Link Layer:** Layer 2. This layer responds to service requests from the Network Layer and issues service requests to the Physical Layer. The Data Link Layer provides the functional and procedural means to transfer data between network entities and to detect and possibly correct errors that may occur in the Physical Layer. *Note:* Examples of data link protocols are HDLC and ADCCP for point-to-point or packet-switched networks and LLC for local area networks.
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[T1 Glossary 2000: Glossary of Telecommunications Terms]

OSPF (Open Shortest Path First): OSPF is a link-state routing protocol. It is designed to be run internal to a single Autonomous System. Compare RIP and BGP.

Outage: The period during which a generating unit, transmission line, or other facility is out of service. [**DOE Glossary of Electricity Terms]**

Outbox: The place where outgoing mail is put prior to being sent on to the mail server. The outbox can also be configured in many e-mail clients to save a copy of all outgoing e-mail for future reference.

Overhead: In communications, all information, such as control, routing, and error-checking characters, that is in addition to user-transmitted data; includes information that carries network status or operational instructions, network routing information, and retransmissions of user data messages that are received in error.

P

P2P (Peer-To-Peer) - Ability of arbitrary pairs of network nodes to manage communication mutual information (by trading off between being clients and servers) in contrast to the master/slave communication scheme.

Packet: A sequence of data, with associated control information, that is switched and transmitted as a whole; refers mainly to the field structure and format defined with the ITU-T X.25 recommendation. Synonym for data unit in the OSI model and used on the network layer. Packet sizes normally varies from 40 to 65,535 (ATM) bytes, depending on network hardware and media, but normally less than 1500. "Packet" is also a generic term used to describe unit of data at all levels of the protocol stack, but it is most correctly used to describe network layer data units.

Packet Filter: Firewall technique that looks at each packet entering or leaving the network and accepts or rejects it based on user-defined rules. Packet filtering is fairly effective and transparent to users, but it is difficult to configure. In addition, it is susceptible to IP spoofing. Operates on the Network Layer.

Packet Lifetime: The number of stations a packet can visit before being discarded.

Packet Loss: Describes an event in which packets or units of information are lost in the exchange between sender and receiver, thereby resulting in no data or incomplete data.

Packet Switching: A process where messages are broken into finite-sized packets that are always accepted by the network. The message packets are sent across different circuit paths. The packets are reassembled into the original message at the end of the circuit. See also X.25, Frame Relay, ATM.

PAD (Packet Assembler/Dissembler): A device that connects a dumb terminal to an X.25 network.

PAM (Pulse Amplitude Modulation): is used as the physical layer in HDSL and ISDN. The modulation consists of sending discrete amplitude levels (symmetric about 0 volts) at a regular rate. Both use the two binary one quaternary (2B1Q) line code. Four analog voltages (called quaternary symbols) are used to represent the four possible combinations of two bits (the "two binary"). These symbols are assigned the names +3, +1, -1, and -3. Each amplitude level being held for one symbol time communicates two bits.

PAP (Password Authentication Protocol): One of two primary methods of being authenticated to connect to the Internet through PPP. CHAP is the other. PAP uses clear text authentication making it less secure than CHAP.

Party: An enterprise object modeling a natural person or any other entity considered to have some of the rights, powers and duties of a natural person. [ISO/IEC 10746, OMG UML]

Password: A secret code assigned to a user. Knowledge of the password associated with the user ID is considered proof of authorization.

Password Creation Policy: Good password create policy usually requires the following rules to be followed:

- six or more characters (to prevent brute-force decipherment)
- change every 30 to 60 days (to prevent long term access by successful attackers)
- restriction of changing a password in less than two-to-seven days (i.e. minimum required age)
- prevention of re-using six-to-24 previous passwords (i.e. managing password history)
- use of at least three different character types: upper case, lower case, numerals, keyboard symbols
- prevention of use of any part of your real name, e-mail address, computer name, phone number, social security number or any other personal ID number, name or phrase.
- prevention of use of common dictionary words, slang or industry acronyms

Path Vector Routing: Enhancement of distance vector routing that includes complete path information. See BGP.

PC (Personal Computer): Term coined by IBM describing an IBM PC compatible desktop computer. Today also refers to other personal computers, such as Apple's Macintosh.

PCS (Personal Communications System): is used for digital cellular telephones.

PDN (Public Data Network): A network established and operated by a PTT, common carrier, or private operating company for the specific purpose of providing data communications services to the public. May be a packet-switched network or a digital network such as DDS.

Peak Demand: The maximum load during a specified period of time. [**DOE Glossary of Electricity Terms]**

Peaking Capacity: Capacity of generating equipment normally reserved for operation during the hours of highest daily, weekly, or seasonal loads. Some generating equipment may be operated at certain times as peaking capacity and at other times to serve loads on an around-the-clock basis. [**DOE Glossary of Electricity Terms]**

Peak Load Plant: A plant usually housing old, low-efficiency steam units; gas turbines; diesels; or pumped-storage hydroelectric equipment normally used during the peak-load periods. [**DOE Glossary of Electricity Terms]**

Peak Load Set: [603-04-22] Generating set whose purpose is to run under discontinuous load conditions and to respond rapidly to peaks in the power demand of the network. [IEC_Glossary_1929b.pdf]

PEM: Privacy Enhanced Mail

Perceptual reference point: A reference point at which there is some interaction between the system and the physical world [ISO/IEC 10746, OMG UML].

Performance: A major factor in determining the overall productivity of a system, performance is primarily tied to availability, throughput and response time.

Perimeter-based Security: The technique of securing a network by controlling access to all entry and exit points of the network.

Peripheral: Any separate device: such as a printer or modem: that connects to and is controlled by a computer.

Permission: A prescription that a particular behavior is allowed to occur. Permission is equivalent to there being no obligation for the behavior not to occur [ISO/IEC 10746, OMG UML].

Perl: Open source high-level programming language with an eclectic heritage written by Larry Wall et al. It derives from the ubiquitous C programming language and to a lesser extent from sed, awk, the Unix shell, and at least a dozen other tools and languages.

Persistence: The property that an object continues to exist across changes of contractual context or of epoch. [ISO/IEC 10746, OMG UML]

Persistence transparency: A distribution transparency which masks, from an object, the deactivation and reactivation of other objects (or itself). Deactivation and reactivation are often used to maintain the persistence of an object when a system is unable to provide it with processing, storage and communication functions continuously. [ISO/IEC 10746, OMG UML]

PGP (Pretty Good Privacy): A publicly available implementation of a public-key encryption system using no trusted third party. *Note:* PGP can be used to apply a digital signature to a message without actually encrypting the text of the message. This is normally used in public postings where the user wants all readers to be able to see the message text and also wants the reader to be able to confirm that the message is unaltered from its original form. Once a digital signature is created with PGP, it is impossible for

anyone to modify either the message or the signature without the modification being detected by PGP. [2382-pt.35]

Physical Device Model: A Physical Device model defines exactly one device. One or more Physical Device models are contained in a Logical Device model. For example, one RTU may contain models of three DR units within it, while handling all communications to the SCADA system. The RTU is acting as a Logical Device, while the 3 DR unit models are the Physical Devices.

Physical Layer: Within the OSI model, the lowest level (Layer 1) of network processing, below the data link layer; concerned with the electrical, mechanical, and handshaking procedures over the interface that connects a device to a transmission medium.

Physical Resource: Any resource that can touched shall be considered a physical resource. This includes buildings, network cabling, network adapters, switches, hubs, routers, Transmission and Distribution equipment, computers, etc…

PING: (Packet InterNet Groper). A program used to test reachability of destinations by sending them an ICMP echo request and waiting for a reply.

PICOM: Pieces of Information for Communication

PKI: see Public Key Infrastructure.

PKCS: The Public-Key Cryptography Standards (PKCS) is a set of standards for public-key cryptography, developed by RSA Laboratories in cooperation with an informal consortium, originally including Apple, Microsoft, DEC, Lotus, Sun and MIT. PKCS has been cited by the OIW (OSI Implementors' Workshop) as a method for implementation of OSI standards. PKCS is compatible with PEM but extends beyond PEM. For example, where PEM can only handle ASCII data, PKCS is designed for binary data as well. PKCS is also compatible with the ITU-T X.509 standard. The published standards are PKCS #1, #3, #5, #6, #7, #8, #9, #10 and #11. **http://www.rsa.com/**

Plaintext: Plaintext is an un-encrypted message.

Planned Generator: A proposal by a company to install electric generating equipment at an existing or planned facility or site. The proposal is based on the owner having obtained (1) all environmental and regulatory approvals, (2) a signed contract for the electric energy, or (3) financial closure for the facility. [**DOE Glossary of Electricity Terms]**

Plant: A facility at which are located prime movers, electric generators, and auxiliary equipment for converting mechanical, chemical, and/or nuclear energy into electric energy. A plant may contain more than one type of prime mover. Electric utility plants exclude facilities that satisfy the definition of a qualifying facility under the Public Utility Regulatory Policies Act of 1978. [**DOE Glossary of Electricity Terms]**

Plant Use: The electric energy used in the operation of a plant. Included in this definition is the energy required for pumping at pumped-storage plants. [**DOE Glossary of Electricity Terms]**

Plant-Use Electricity: The electric energy used in the operation of a plant. This energy total is subtracted from the gross energy production of the plant; for reporting purposes the plant energy production is then reported as a net figure. The energy required for pumping at pumped-storage plants is, by definition, subtracted, and the energy production for these plants is then reported as a net figure. [**DOE Glossary of Electricity Terms]**

Platform: A particular combination of hardware and/or software. For example, the Macintosh is a platform. Any Windows 98 computer uses the Windows 98 platform. A computer that uses an Ultra SPARC chip from Sun is a hardware platform. An Alpha powered computer is an Alpha platform and it can use either Windows NT or Unix to make up an Alpha Powered NT platform or Alpha Powered Unix platform.

Plenum Cable: Cable with a special Teflon coating designed for use in suspended ceilings, in inside walls, or between floors. The Teflon coating provides low flame-spread and low, nontoxic smoke in the case of an accident. Plenum cables should meet the CMR (Communications Riser Cable) or CMP (Communications Plenum Cable) specifications of the National Electric Code and are often used for cable runs in air-return areas.

Plug-in: A (usually small) piece of software that adds features to a larger piece of software. Common examples are plug-ins for the Netscape® browser and web server. Adobe Photoshop® also uses plug-ins. The idea behind plug-ins is that a small piece of software is loaded into memory by the larger program, adding a new feature, and that users need only install the few plug-ins that they need, out of a much larger pool of possibilities. Plug-ins are usually created by people other than the publishers of the software the plug-in works with.

PMS (Power Management System): See EMS.

Point of Common Coupling (PCC): The point where a Local Electric Power System (EPS) is connected to an Area Electric Power System. This term is used in the context of Distributed Resources (DR) that are interconnected with the power system. [**IEEE P1547 Standard for Interconnecting Distributed Resources with Electric Power Systems]**

Point of Presence (POP): The physical location within a LATA where an inter-exchange carrier's circuits interconnect with the local lines of telephone companies in that LATA.

Policy: Organizational-level rules governing acceptable use of computing resources, security practices, and operational procedures. A rule can be expressed as an obligation, permission or a prohibition.

Polling: Communications access control procedure where a primary (master) station systematically invites secondary stations, one at a time, to transmit data.

POP3 (Post Office Protocol, version 3): The protocol used by an e-mail client to get e-mail from a users mailbox on the mail server.

Port: (1) The place where the various protocols send and receive data on a particular computer. Most protocols have standard ports and users rarely have to worry about those ports. Users will have to specify ports in certain types of client/server applications such as MUDS and IRC. In TCP/IP; an integer identifying a process. A port number and an IP address defines a socket address. (2): One of a computer's physical input/output channels.

Post-condition: A predicate that a specification requires to be true immediately after the occurrence of an action. [ISO/IEC 10746, OMG UML]

Postmaster: The person responsible for taking care of mail problems, answering queries about users, and other related work at a site.

POTS: Plain Old Telephone Service.

Power: The rate at which energy is transferred. Electrical energy is usually measured in watts. Also used for a measurement of capacity. [**DOE Glossary of Electricity Terms]**

Power Exchange: The entity that will establish a competitive spot market for electric power through day- and/or hour-ahead auction of generation and demand bids. [**DOE Glossary of Electricity Terms]**

Power Exchange Generation: Generation being scheduled by the power exchange. [**DOE Glossary of Electricity Terms]**

Power Exchange Load: Load that has been scheduled by the power exchange and which is received through the use of transmission or distribution facilities owned by participating transmission owners. [**DOE Glossary of Electricity Terms]**

Power Marketers: Business entities engaged in buying, selling, and marketing electricity. Power marketers do not usually own generating or transmission facilities. Power marketers, as opposed to brokers, take ownership of the electricity and are involved in interstate trade. These entities file with the Federal Energy Regulatory Commission for status as a power marketer. [**DOE Glossary of Electricity Terms]**

Power Pool: An association of two or more interconnected electric systems having an agreement to coordinate operations and planning for improved reliability and efficiencies. [**DOE Glossary of Electricity Terms]**

PPP (Point to Point Protocol): PPP provides a standard method for transporting multi-protocol datagrams over point-to-point links. PPP is also the Internet Standard for transmission of IP packets over serial lines; i.e., the communication using a standard telephone line and a high-speed modem. (Replaces SLIP).

PQ: 1. Real and Reactive Power; 2. Power Quality

Precondition: A predicate that a specification requires to be true for an action to occur. [ISO/IEC 10746, OMG UML]

Prescription: An act that establishes a rule. [ISO/IEC 10746, OMG UML]

Presentation Layer: In the OSI model, the layer of processing that provides services to the Application Layer, allowing it to interpret the data exchanged, as well as to structure data messages for transmission in a specific display and control format.

PRI (Primary Rate Interface): ISDN primary-rate service consisting of B Channels and one 64 Kbps D Channel. Overhead is 8 kbps which adds up to 1.544 Mbps (same as DS-1/T-1 Line). See also 23B+D.

Primary Control - Power control of the generating unit, done using an individual speed governor, according to the grid frequency and depending on the governor setting.

Prime Mover: The engine, turbine, water wheel, or similar machine that drives an electric generator; or, for reporting purposes, a device that converts energy to electricity directly (e.g., photovoltaic solar and fuel cell(s)). [**DOE Glossary of Electricity Terms]**

Principal: A party that has delegated (authority, a function, etc.) to another. [ISO/IEC 10746, OMG UML]

Private Key: In encryption, one key (or password) is used to both lock and unlock data. Compare with public key.

Process: A collection of steps taking place in a prescribed manner and leading to an objective. [ISO/IEC 10746, OMG UML]

Producer object (with respect to a communication): An object that is the source of the information conveyed. [ISO/IEC 10746, OMG UML]

Program: See Application.

Programmatic reference point: A reference point at which a programmatic interface can be established to allow access to a function. A programmatic conformance requirement is stated in terms of a behavioral compatibility with the intent that one object be replaced by another. A programmatic interface is an interface that is realized through a programming language binding [ISO/IEC 10746, OMG UML].

Prohibition: A prescription that a particular behavior must not occur. A prohibition is equivalent to there being an obligation for the behavior not to occur. [ISO/IEC 10746, OMG UML]

Propagation delay: The time it takes a signal composed of electromagnetic energy to travel from one point to another over a transmission channel; usually most noticeable in communicating with satellites; normally, the speed-of-light delay.

Propagation velocity (% of c): The speed at which an electrical signal travels in the cable. The value given typically must be multiplied by the speed of light (c) to obtain units of meters per second. For example, a cable that lists a propagation velocity of 78% gives a velocity of $0.78 * 300*10^6 = 234*10^6$ meters per second.

Proposition: An observable fact or state of affairs involving one or more entities, of which it is possible to assert or deny that it holds for those entities. [ISO/IEC 10746, OMG UML]

Protocol: A formal description of message formats and the rules two computers must follow to exchange messages. Standard protocols allow computers from different manufacturers to communicate, providing programs running on both ends agree on what the data means.

Protocol object: An engineering object in a channel, which communicates with other protocol objects in the same channel to achieve interaction between basic engineering objects (possibly in different clusters, possibly in different capsules, possibly in different nodes). [ISO/IEC 10746, OMG UML]

Proxy: 1) A method of replacing the code for a service applications with an improved version that is more security aware. The preferred method is by "service communities". Proxies evolved from socket implementations. 2) A software agent that acts on behalf of a user. Typical proxies accept a connection from a user, make a decision as to whether or not the user or client address is permitted to use the proxy, perhaps does additional authentication, and then completes a connection on behalf of the user to a remote destination.

Proxy Server: a proxy server is a server that acts as an intermediary between a workstation user and the Internet so that the enterprise can ensure security, administrative control, and caching service. A proxy server is associated with or part of a gateway server that separates the enterprise network from the outside network and a firewall server that protects the enterprise network from outside intrusion.

PSK (Phase Shift Keying): A digital-to-analog modulation method in which the phase of the carrier signal is varied to represent a specific bit pattern.

PSTN: Public Switched Telephone Network.

Public Key: In cryptography, a public key is a value provided by some designated authority as an encryption key that, combined with a private key derived from the public key, can be used to effectively encrypt messages and digital signatures. In encryption a two-key system in which the key used to lock data is made public, so everyone can

"lock." A second private key is used to unlock or decrypt. The use of combined public and private keys is known as asymmetric cryptography. A system for using public keys is called a public key infrastructure (PKI).

Public Key Certificate: A public key certificate is a digitally signed document that serves to validate the sender's authorization and name. The document consists of a specially formatted block of data that contains the name of the certificate holder (which may be either a user or a system name) and the holder's public key, as well as the digital signature of a certification authority for authentication. The certification authority attests that the sender's name is the one associated with the public key in the document. A user ID packet, containing the sender's unique identifier, is sent after the certificate packet. There are different types of public key certificates for different functions, such as authorization for a specific action or delegation of authority. Public key certificates are part of a public key infrastructure that deals with digitally signed documents. The other components are public key encryption, trusted third parties (such as the certification authority), and mechanisms for certificate publication and issuing.

Public Key Cryptography: Unlike secret key cryptography, public key cryptography uses two different keys - one public and one private. They are created simultaneously using the same algorithm (a popular one is known as RSA) by a certificate authority (CA). The keys are mathematically related, yet it is computationally infeasible to deduce one from the other. The private key is given only to the requesting party and the public key is made publicly available (as part of a digital certificate) in a directory that all parties can access. Anyone with the public key can encrypt a message but not decrypt it. Only the person with the private key can decrypt the message.

Public Key Infrastructure: PKI is the combination of software, encryption technologies, and services that enables the protection and the security of communications and transactions.

Publish-Subscribe: The publish-subscribe concept is a method by which systems interact with each other. In this concept, one or more systems subscribe to data provided by another system. When some triggering event takes place, such as that data is updated, or a specific period of time has passed, or some alarm or significant event occurs, then the data is "published" to the subscribing systems. This concept has only recently begun to be implemented extensively. Another concept more commonly used is client-server.

Pumped-Storage Hydroelectric Plant: A plant that usually generates electric energy during peak-load periods by using water previously pumped into an elevated storage reservoir during off-peak periods when excess generating capacity is available to do so. When additional generating capacity is needed, the water can be released from the reservoir through a conduit to turbine generators located in a power plant at a lower level. [**DOE Glossary of Electricity Terms]**

Purchased Power Adjustment: A clause in a rate schedule that provides for adjustments to the bill when energy from another electric system is acquired and it varies from a

specified unit base amount. [**DOE Glossary of Electricity Terms]**

PURPA: The Public Utility Regulatory Policies Act of 1978, passed by the U.S. Congress. This statute requires States to implement utility conservation programs and create special markets for co-generators and small producers who meet certain standards, including the requirement that States set the prices and quantities of power the utilities must buy from such facilities. [**DOE Glossary of Electricity Terms]**

Push Technology: Automatically deliver information, such as news headlines or product updates, directly to a user's computer in a customized format at designated times.

Q

QAM (Quadrature Amplitude Modulation): QAM is method for encoding data on a single carrier frequency. The modulation encodes data (or bits) as discrete phase plus amplitude changes of a carrier tone. Cable modems and ADSL use QAM. With QAM, the carrier signal is split into two signals, shifted in phase by 90 degrees. Each component is modulated with ASK, using as many as 16 amplitude levels to represent as many as 256 different states (256-QAM).

Qualifying Facility (QF): A cogeneration or small power production facility that meets certain ownership, operating, and efficiency criteria established by the Federal Energy Regulatory Commission (FERC) pursuant to the Public Utility Regulatory Policies Act (PURPA). **[DOE Glossary of Electricity Terms]**

Quality of Service (QoS): A parameter specifying the level of performance needed for communications, such as transit delay, priority, accuracy, or reliability.

QuickTime: A video and sound format developed by Apple Computers that has become a standard on the Internet.

R

Radial Distribution System - A part of the distribution system that is operated as a radial system.

RADSL: Rate Adaptive asymmetrical Digital Subscriber Line is a technology based on ADSL. It allows different data rates depending on user and the type of communication: data, voice, etc. See also xDSL.

RARP (Reverse Address Resolution Protocol): A TCP/IP protocol that allows a host to find its Internet address given its physical network address. Defined for Ethernet in RFC0903. See also RFC1931.

Rate Base: The value of property upon which a utility is permitted to earn a specified rate of return as established by a regulatory authority. The rate base generally represents the value of property used by the utility in providing service and may be calculated by any one or a combination of the following accounting methods: fair value, prudent investment, reproduction cost, or original cost. Depending on which method is used, the rate base includes cash, working capital, materials and supplies, and deductions for accumulated provisions for depreciation, contributions in aid of construction, customer advances for construction, accumulated deferred income taxes, and accumulated deferred investment tax credits. [**DOE Glossary of Electricity Terms]**

Rated capacity - The highest long-lasting capacity that can be generated, transmitted or delivered by the given power equipment, defined by the manufacturer.

Rated Voltage - Voltage level planned by the manufacturer in reference to operation of the particular equipment.

Ratemaking Authority: A utility commission's legal authority to fix, modify, approve, or disapprove rates, as determined by the powers given the commission by a State or Federal legislature. [**DOE Glossary of Electricity Terms]**

RBAC: Role Based Access Control. Form of identity-based access control where the system entities that are identified and controlled are functional positions in an organization or process.[From www.cisco.com]

RC4: is a stream cipher designed by Rivest for RSA Data Security (now RSA Security). It is a variable key-size stream cipher with byte-oriented operations. The algorithm is based on the use of a random permutation. RC4 is used for secure communications, as in the encryption of traffic to and from secure web sites using the SSL protocol, and in a number of software applications; e.g., Lotus Notes and Oracle Secure SQL.

RDA: Remote Data Access

RDF (Resource Description Framework): RDF is a language recommended by the W3C for expressing metadata that machines can process simply. It is expressed as a special kind of XML document.

RDF Schema: RDF Schema is a schema specification language expressed using RDF to describe resources and their properties, including how resources are related to other resources, which is used to specify an application-specific schema.

RE: In support of Research or Education (in reference to what the Internet connection is used for).

Reactivation: Cloning a cluster following its deactivation. [ISO/IEC 10746, OMG UML]

Real Time Pricing (RTP): Market pricing arrangement in which the future price of electricity is provided to the customers so that they can make choices on when and how much electricity to use. Generally, RTP subscribers receive these price quoted a business-day in advance, by 4:00 p.m. But, in specialized applications, final usage prices are sent to subscribers only an hour in advance of their applicability. RTP services are offered as optional services to utility retail customers under term contract arrangements. Because usage prices are set daily and for each hour individually, RTP requires customers to respond to marginal, not average supply costs and thereby the efficiency of resource utilization increases.

Recovery: Cloning a cluster after cluster failure or deletion. [ISO/IEC 10746, OMG UML]

Recursion: The facility of a programming language to be able to call functions from within themselves.

Reference Architecture: A reference architecture is the generalized architecture of several end systems that share one or more common domains. The reference architecture defines the infrastructure common to the end systems and the interfaces of components that will be included in the end systems. The reference architecture is then instantiated to create a software architecture of a specific system. The definition of the reference architecture facilitates deriving and extending new software architectures for classes of systems. A reference architecture, therefore, plays a dual role with regard to specific target software architectures. First, it generalizes and extracts common functions and configurations. Second, it provides a base for instantiating target systems that use that common base more reliably and cost effectively. [Ref Arch]. See http://dev.w3.org/cvsweb/~checkout~/2002/ws/arch/glossary/wsa-glossary.html

Reference point: An interaction point defined in an architecture for selection as a conformance point in a specification that is compliant with that architecture. [ISO/IEC 10746, OMG UML]

Refinement: The process of transforming one specification into a more detailed specification. Specifications and their refinements typically do not coexist in the same system description. [ISO/IEC 10746, OMG UML]

Regional Transmission Organization (RTO): A utility industry concept that the Federal Energy Regulatory Commission embraced for the certification of voluntary groups that would be responsible for transmission planning and use on a regional basis. [**DOE Glossary of Electricity Terms]**

Regulation: The governmental function of controlling or directing economic entities through the process of rulemaking and adjudication. [**DOE Glossary of Electricity Terms]**

Reliability [Electric System]: Electric system reliability has two components--adequacy and security. Adequacy is the ability of the electric system to supply to aggregate electrical demand and energy requirements of the customers at all times, taking into account scheduled and unscheduled outages of system facilities. Security is the ability of the electric system to withstand sudden disturbances, such as electric short circuits or unanticipated loss of system facilities. The degree of reliability may be measured by the frequency, duration, and magnitude of adverse effects on consumer services. [**DOE Glossary of Electricity Terms]**

Relocation transparency: A distribution transparency which masks relocation of an interface from other interfaces bound to it. [ISO/IEC 10746, OMG UML]

Replication transparency: A distribution transparency which masks the use of a group of mutually behaviorally compatible objects to support an interface. Replication is often used to enhance performance and availability. [ISO/IEC 10746, OMG UML]

Remote Access: The hookup of a remote computing device via communications lines such as ordinary phone lines or wide area networks to access network applications and information.

Remote Control - Equipment operation control done by the dispatch service of the competent operator, carried out through the relevant automation or telecommunication equipment.

Remote energy metering system - Set of equipment designed for metering and remote transmission of the energy values to the transmission system operator.

Remote Terminal Unit (RTU): A Remote Terminal Unit (RTU) is used to monitor and control devices in a remote location, and is connected to a communications network for exchanging information. An RTU can be a generic entity, which monitors status and analog points that have no “named objects” associated with them. The actual meanings of

these points are only associated with them once they are in some SCADA system. An RTU can also act as a controller of a physical device, thus acting as its "intelligence" (see IED). In this role, it can contain a model of the device, including named objects, some calculation and control algorithms, and possibly some closed-loop automatic mode operations.

Renewable Resources: Naturally, but flow-limited resources that can be replenished. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Some (such as geothermal and biomass) may be stock-limited in that stocks are depleted by use, but on a time scale of decades, or perhaps centuries, they can probably be replenished. Renewable energy resources include: biomass, hydro, geothermal, solar and wind. In the future, they could also include the use of ocean thermal, wave, and tidal action technologies. Utility renewable resource applications include bulk electricity generation, on-site electricity generation, distributed electricity generation, non-grid-connected generation, and demand-reduction (energy efficiency) technologies. [**DOE Glossary of Electricity Terms]**

Repeater: In digital transmission, equipment that receives a pulse train, amplifies it, retimes it, and then reconstructs the signal for retransmission. In fiberoptics, a device that decodes a low-power light signal, converts it to electrical energy, and then retransmits it via an LED or laser source. Also called a "regenerative repeater." Repeating a digital signal is unlike amplifying an analog signal where noise is amplified as well. A repeater operates on the physical layer in the OSI model.

Report Control Block (RCB): A data structure that describes the criteria for the Server to initiate Unsolicited Data transfers by time and/or event. The data transmitted will either be the complete Data Object or DataSet (no RBE), or it will be only the changed values within a Data Object or DataSet (if RBE is specified).

Report-by-Exception: Mode of operation in which an end system (e.g., RTU or IED) only reports information that has changed since data was last transmitted.

Report-by-Exception (RBE) Criteria: RBE Criteria are the values against which Data Objects in a DataSet will be checked to determine if an "event condition" has occurred. When an "event condition" occurs, then specified Data Objects in the DataSet are collected to be transmitted to the designated Client.

Reserve Margin (Operating): The amount of unused available capability of an electric power system at peakload for a utility system as a percentage of total capability. [**DOE Glossary of Electricity Terms]**

Residential [Customer]: The residential sector is defined as private household establishments which consume energy primarily for space heating, water heating, air conditioning, lighting, refrigeration, cooking and clothes drying. The classification of an individual consumer's account, where the use is both residential and commercial, is based on principal use. For the residential class, do not duplicate consumer accounts due to

multiple metering for special services (water, heating, etc.). Apartment houses are also included. [**DOE Glossary of Electricity Terms]**

Resolve: Translate an Internet name into its equivalent IP address or other DNS information.

Resource: An enterprise object which is essential to some behavior and which requires allocation or may become unavailable. [ISO/IEC 10746, OMG UML]

Responding object: An object taking part in a communication, which is not the initiating object. [ISO/IEC 10746, OMG UML]

Response Time: Time between the request and the response for a network transaction.

Restructuring: The process of replacing a monopoly system of electric utilities with competing sellers, allowing individual retail customers to choose their electricity supplier but still receive delivery over the power lines of the local utility. It includes the reconfiguration of the vertically-integrated electric utility. [**DOE Glossary of Electricity Terms]**

Retail: Sales covering electrical energy supplied for residential, commercial, and industrial end-use purposes. Other small classes, such as agriculture and street lighting, also are included in this category. [**DOE Glossary of Electricity Terms]**

Retail Competition: The concept under which multiple sellers of electric power can sell directly to end-use customers and the process and responsibilities necessary to make it occur. [**DOE Glossary of Electricity Terms]**

Retail Market: A market in which electricity and other energy services are sold directly to the end-use customer. [**DOE Glossary of Electricity Terms]**

Retail Wheeling: The process of moving electric power from a point of generation across one or more utility-owned transmission and distribution systems to a retail customer. [**DOE Glossary of Electricity Terms]**

Revenue Meter: A meter that has the accuracy to be used for billing and can be calibrated according to industry standards used for measurement accuracy.

RF: Radio Frequency.

RFC (Request For Comments): The documents that contain the standards and other information for the TCP/IP protocols and the Internet in general. They are available at IETF RFC Page.

RFD (Request For Discussion): Usually a two- to three-week period in which the particulars of newsgroup creation are battled out.

RG: Radio (government) Grade coaxial cable. Arbitrary definition of a family of cables and transmission lines, bulk, RF, without terminals. Originally used in the military. No standard defined, anybody can call a cable RG coax.

RG-11: Thick Ethernet coaxial cable. Satellite Cable. 75-Ohm nominal impedance.

RG-58: Stranded copper core (0.66mm or 0.78mm), 50 ohms.

RG-59: 75-ohm coaxial cable. Inferior cable sold to home owners installing their own cable TV extensions. The problem is that the cable tends to leak signal, and actually can drive a cable system out of compliance with the FCC rules on leakage.

RG-6: 75-ohm coaxial cable. Higher frequency broadband transmissions. Used in broadband transmissions e.g. cable TV.

RG-62: 93-ohm coaxial cable. Used in ArcNet.

RG-8: Thick Ethernet coaxial cable, 50 ohms.

RG-9: Thick Ethernet coaxial cable. 50 ohms.

RIP (Routing Information Protocol): Interior routing protocol based on Distance Vector Routing. Compare OSPF and BGP.

Risk Analysis: The analysis of an organization's information resources, existing controls and computer system vulnerabilities. It establishes a potential level of damage in dollars and/or other assets.

RJ-11: Registered Jack-11 is a 4-conductor connector. Used for voice/data applications: telephone (single-line), extended-distance peripherals. The RJ-11 connector has 6-position, 4-conductor arranged in a single row. The standard phone jack in North America. Description

RJ-12: Registered Jack-12 is a 6-conductor connector. Used for voice/data applications: telephone (two-line), networking, extended-distance peripherals. The RJ-12 connector has 6-position, 6-conductor arranged in a single row.

RJ-45: Registered Jack-45 is an 8-conductor connector. Used for voice/data applications: PBX, networking, dumb terminal, point-of-sale. The RJ-45 connector has 8-position, 8-conductor arranged in a single row. Typically used with CAT-5 cable in LANs.

RMI (Remote Method Invocation): RMI-IIOP provides developers an implementation of the Java RMI API over the Object Management Group's industry-standard Internet Inter-Orb Protocol (IIOP). With it, developers can write remote interfaces between clients and servers, and implement them just using Java technology and the Java RMI APIs. See also J2EE.

RM-ODP (Reference Model for Open Distributed Processing: The Reference Model of Open Distributed Processing, ITU-T Rec. X.901 | ISO/IEC 10746-1 to ITU-T Rec. X.904 | ISO/IEC 10746-4, commonly referred to as RM-ODP, provides a framework to support the development of standards that will support distributed processing in heterogeneous environments. It is based, as far as possible, on the use of formal description techniques for specification of the architecture. In support of the generic design goals, it facilitates specifying integration architecture with the following properties: openness, flexibility, modularity, federation, manageability, and provisions for quality of service, security and transparency. For more info on RM RM-ODP see Janis Putman's "Architecting with RM-ODP" published by Prentice Hall, ISBN 0-13-019116-7.

RMON (Remote Network Monitoring) provides standard information that a network administrator can use to monitor, analyze, and troubleshoot a group of distributed local area networks (LANs) and interconnecting T-1/E-1 lines from a central site. RMON specifically defines the information that any network monitoring system will be able to provide. RMON is defined in RFC2819 as part of the Management Information Base (MIB) and as an extension of the Simple Network Management Protocol (SNMP). RMON can be supported by hardware monitoring devices (known as "probes" or "monitors") or through software or some combination.

Robot: see Bot

Rogue program: Any program intended to damage programs or data. Encompasses malicious Trojan Horses.

Role: Identifier for a behavior, which may appear as a parameter in a template for a composite object, and which is associated with one of the component objects of the composite object. [ISO/IEC 10746, OMG UML]

ROSE (Remote Operations Service Element): Communication protocol defined in ISO/IEC 9072.

RosettaNet: A consortium of more than 400 of the world's leading Electronic Components (EC), Information Technology (IT), Semiconductor Manufacturing (SM) and Solution Provider (SP) companies, RosettaNet is a self-funded, non-profit organization dedicated to creating, implementing and promoting open e-business standards. These standards form a common e-business language, aligning processes between trading partners on a global basis. Based on XML technology. Competes with BizTalk and ebXML. http://rosettanet.org

Route: The path that network traffic takes from its source to its destination.

Routed Protocols: Protocols that are routable over an internetwork See IP, AppleTalk, DECnet, NetWare, SNA, VINES, and XNS. Sometimes referred as routable protocols. See also Routing. Not to be confused with Routing Protocols.

Router: An internetworking device that connects two or more networks by forwarding packets from one network to another. It operates at the third OSI layer. It also chooses the best path between two networks when there are multiple paths.

Routing: Finding an effective or efficient path through a network to a destination computer. Routing is handled by the network or communication software and hardware.

Routing Protocols: Protocols used by routers when communicating and sharing information. See BGP, OSPF, and RIP.

RS-232: see EIA-232.

RS-422: see EIA-422.

RS-423: see EIA-423.

RS-485: see EIA-485.

RSA encryption: A public key cryptosystem named by its inventors, Rivest, Shamir and Adleman, who hold the patent. It uses key lengths of 768, 1024, or 2048 bits. http://www.rsa.com

RTO (Regional Transmission Organization): An RTO is responsible for the reliable operation of the power system, using market energy and ancillary services transactions as the operational requirements. RTOs must be completely independent financially from market participants, have direct operational authority over power system generation which is bid into the market, and have exclusive and independent authority over transmission tariffs and rates. In addition, they are responsible for providing open access to market participants to schedule energy transactions and offer ancillary services, determining ATC and TTC, monitoring market operations, providing interregional coordination, and establishing and/or approving long range transmission plans.

RTP: See Real Time Pricing.

RTU (Remote Terminal Unit): is used to monitor data from field equipment and report it to a SCADA or DAC system, as well as receive control commands from a SCADA system and issue them to the appropriate field equipment.

S

SA (Substation Automation): in which hard-wired substation components are replaced by digital equipment such as RTUs, IEDs, networks, and software applications.

SA: Scheduling Application

SAML: Security Assertion Markup Language Version

SCADA (Supervisory Control and Data Acquisition): SCADA systems are used by utility operators or dispatchers to monitor and control many different devices, via communications to remote sites which have RTUs or IEDs capable of reporting data from physical devices, and issuing control commands to them.

Scalability: The ability to expand a computing solution to support large numbers of users without impacting performance.

Scale: Multiplier used to convert a value from the measured value to the appropriate engineering units.

Schedule: The specification of intended energy flow over transmission facilities. Schedules are stated in MW for a given time.

Scheduling Coordinators: Entities certified by the Federal Energy Regulatory Commission that act as a go-between with the Independent System Operator on behalf of generators, supply aggregators (wholesale marketers), retailers, and customers to schedule the distribution of electricity. [**DOE Glossary of Electricity Terms]**

Scheduled Outage: The shutdown of a generating unit, transmission line, or other facility, for inspection or maintenance, in accordance with an advance schedule. [**DOE Glossary of Electricity Terms]**

Scope : The behavior that system is expected to exhibit. [ISO/IEC 10746, OMG UML]

SDSL: Symmetric (or single-line) Digital Subscriber Line is the same as HDSL, but uses only one single twisted pair cable. See also xDSL.

Search Engine: A program, which indexes and retrieves web sites based on keywords input by a user. Search engines rely on automated programs, variously known as spiders or robots, to index sites on the Internet according to keywords. No human evaluation is conducted to determine the relevancy of sites. Rather, the software relies on Boolean logic to deliver search results based on the occurrence of words or search terms entered by the user.

Secret Key Cryptography: Data encrypted and decrypted with same (symmetrical) key. It is the traditional way of encrypting messages; e.g., Caesar cypher, one-time pad, Enigma. It is a fast method with tested algorithms available; e.g., DES, RC4, IDEA. Strength of scheme largely depends on size of key. Weakness of the method is the distribution of the keys. Public Key Cryptography can be used for key distribution; e.g., PGP.

Secured Electronic Transaction (SET): Standard for electronic shopping with payment cards over the Internet.

Security Policy: A set of rules that apply to all security-related areas and activities in a particular security domain. A policy should include the purpose for security, organizational security issues, and cyber technologies.

Select Before Operate (SBO): A two step device control mechanism consisting of the Select service followed by a Control/Operate service. The Select service is used to arm the device. The device enters the SELECTED state for some period of time. The Control service is used to carry out a control command if and only if the device is SELECTED for the issuing client. This sequence has the effect that a client can lock-out other clients from operating a point during a pre-determined period of time so that it is the only client that can operate that point during that time.

Self-extracting Archive: A file that contains other files compressed into a single archive. When opened, the self-extracting archive will decompress those files automatically and place them where specified, either by the user or the archive itself. The two most common file extensions used for self-extracting archives are .exe on PC's and .sea on Macintosh.

Semantics: Meaning of the information or data.

Sentence: A linguistic construct containing one or more terms and predicates; a sentence may be used to express a proposition about the entities to which the terms refer. [ISO/IEC 10746, OMG UML]

Sequence Of Events (SOE): Sequence Of Events is an ordered, timestamped log of the state changes of binary inputs (also known as status inputs). Used to recreate or analyze the behavior of utility power, gas, or water systems over a period of time.

Server: A computer that shares its resources, such as printers and files, with other computers on the network but is used only to store and retrieve information.

Server Farm: A group of servers that are linked together as a ‘single system image’ to provide centralized administration and horizontal scalability.

Server object: An object which performs some function on behalf of a client object. [ISO/IEC 10746, OMG UML]

Server Security: The hardening of a server's operating system. This includes turning off unnecessary services, keeping the system up-to-date with the latest security and OS patches, etc. See Host-Based Security.

Server-based Computing: An innovative, server-based approach to delivering business-critical applications to end-user devices, whereby an application's logic executes on the server and only the user interface is transmitted across a network to the client. Its benefits include single-point management, universal application access, bandwidth-independent performance, and improved security for business applications.

Service Level Agreement: A Service Level Agreement (SLA) is a contract between a network service provider and a customer that specifies, usually in measurable terms, what services the network service provider will furnish. A network service provider may be an external company or another department within the customer's company. Some metrics that SLAs may specify include:

- What percentage of the time services will be available
- The number of users that can be served simultaneously
- Specific performance benchmarks to which actual performance will be compared, such as available bandwidth, average and peak response times, number and duration of permanent and temporary failures, mean time to repair/correct a failure, percent of messages lost or requiring retransmission, etc.
- The schedule for notification in advance of network changes that may affect users
- Help desk response time for various classes of problems
- Dial-in access availability
- Usage statistics that will be provided

Servlet: Java™ Servlet technology provides web developers with a simple, consistent mechanism for extending the functionality of a web server and for accessing existing business systems. A servlet can almost be thought of as an applet that runs on the server side -- without a face. Servlets are the Java platform technology of choice for extending and enhancing web servers. Servlets provide a component-based, platform-independent method for building web-based applications, without the performance limitations of CGI programs. And unlike proprietary server extension mechanisms (such as the Netscape Server API, ISAPI, or Apache API), servlets are server- and platform-independent. See also J2EE. More...

Session Layer: Layer five of the OSI reference model; responsible for the establishment, management, and termination of logical connections between two end users.

SGML (Standard Generalized Markup Language): SGML is a system for organizing and tagging elements of a document. SGML was developed and standardized by the ISO in 1986 (ISO 8879:1986). SGML itself does not specify any particular formatting; rather, it specifies the rules for tagging elements. These tags can then be interpreted to format elements in different ways. More... See also HTML and XML.

Shareware: Software which has been released by its author to the general public to try out before buying. It is expected that if a user likes the shareware software, that user will send the author the requested fee. Shareware is not free and is almost always protected by copyrights.

S-HTTP: Secure HTTP is a secure message-oriented communications protocol designed for use in conjunction with HTTP in order to enable spontaneous commercial transactions for a wide range of applications. It is implemented as a Layer 7 security protocol.

Shunt Capacitance (pFft): The amount of equivalent capacitive load of the cable, typically listed in a per foot basis. One of the factors limiting total cable length is the capacitive load. Systems with long lengths benefit from using low capacitance cable.

SI: Scheduling Infrastructure

SIDF: System Independent Data Format

Signal: 1.Electromagnetic waves propagated along a transmission medium. Signals can be either analog or digital. Analog signals can have any value in a range, while digital signals can only have a limited number of values. The enemies of both analog and digital signals include attenuation, noise, and crosstalk. Attenuation is the tendency of a signal to get weaker with distance. Analog signals must be amplified before they become too diminished to be detectable. Unfortunately, analog signals accumulate noise with repeated amplification. Digital signals, while they are degraded by attenuation, can be detected and repeated indefinitely with no loss of data. 2.An atomic shared action resulting in one-way communication from an initiating object to a responding object. [ISO/IEC 10746, OMG UML]

Signal interface: An interface in which all the interactions are signals. [ISO/IEC 10746, OMG UML]

Signal interface signature: An interface signature for a signal interface. A signal interface signature comprises a finite set of action templates, one for each signal type in the interface. Each action template comprises the name for the signal, the number, names and types of its parameters and an indication of causality (initiating or responding, but not both) with respect to the object which instantiates the template. [ISO/IEC 10746, OMG UML]

Signal-To-Noise Ratio: When used in reference to Usenet activity, it describes the relation between amounts of actual information in a discussion, compared to its quantity.

Signature: Text which is automatically attached to the end of each e-mail sent out. This text may be contained within the e-mail client itself or in a text file residing elsewhere on the computer.

sit: The most common archive format used on the Macintosh.

SI Units (International System of Units): The modern form of the metric system, which has been adopted by the United States and most other nations. *Note:* The SI is constructed from seven base units for independent physical quantities. *Tables showing these values are included below and are current as of Fall 1995.*

SI Prefixes. The common metric prefixes are;

Multiplication Factor	Prefix Name	Prefix	Symbol
1 000 000 000 000 000 000 000 000 =	10^{24}	yotta	Y
1 000 000 000 000 000 000 000 =	10^{21}	zetta	Z
1 000 000 000 000 000 000 =	10^{18}	exa	E
1 000 000 000 000 000 =	10^{15}	peta	P
1 000 000 000 000 =	10^{12}	tera	T
1 000 000 000 =	10^{9}	giga	G
1 000 000 =	10^{6}	mega	M
1 000 =	10^{3}	kilo	k
100 =	10^{2}	hecto	h
10 =	10^{1}	deka	da
0.1 =	10^{-1}	deci	d
0.01 =	10^{-2}	centi	c
0.001 =	10^{-3}	milli	m
0.000 001 =	10^{-6}	micro	□
0.000 000 001 =	10^{-9}	nano	n
0.000 000 000 001 =	10^{-12}	pico	p
0.000 000 000 000 001 =	10^{-15}	femto	f
0.000 000 000 000 000 001 =	10^{-18}	atto	a
0.000 000 000 000 000 000 001 =	10^{-21}	zepto	z
0.000 000 000 000 000 000 000 001 =	10^{-24}	yocto	y

SI Base Units

Quantity	Unit Name	Unit Symbol
length	meter	m
mass	kilogram	kg
time	second	s
electric current	ampere	A
thermodynamic temperature	kelvin	K

amount of substance	mole	mol
luminous intensity	candela	cd

SI derived units. Derived units are formed by combining base units and other derived units according to the algebraic relations linking the corresponding quantities. The symbols for derived units are obtained by means of the mathematical signs for multiplication, division, and use of exponents. For example, the SI unit for velocity is the *meter per second* (m/s or $m \cdot s^{-1}$), and that for angular velocity is the *radian per second* (rad /s or $rad \cdot s^{-1}$). Some derived SI units have been given special names and symbols, as listed in this table.

Quantity	Unit Name	Unit Symbol	Expression in Terms of Other SI Units
Absorbed dose, specific energy imparted, kerma, absorbed dose index	gray	Gy	J/kg
Activity (of a radionuclide)	becquerel	Bq	1/s
Celsius temperature	degree Celsius	□C	K
Dose equivalent	sievert	Sv	J/kg
Electric capacitance	farad	F	C/V
Electric charge, quantity of electricity	coulomb	C	A•s
Electric conductance	siemens	S	A/V
Electric inductance	henry	H	Wb/A
Electric potential, potential difference, electromotive force	volt	V	W/A
Electric resistance	ohm	□	V/A
Energy, work, quantity of heat	joule	J	N•m
Force	newton	N	$kg \cdot m/s^2$
Frequency (of a periodic phenomenon)	hertz	Hz	1/s
Illuminance	lux	lx	lm/m^2
Luminous flux	lumen	lm	cd•sr
Magnetic flux	weber	Wb	V•s
Magnetic flux density	tesla	T	Wb/m^2
Plane angle	radian	rad	m/m
Power, radiant flux	watt	W	J/s

Pressure, stress	pascal	Pa	N/m^2
Solid angle	steradian	sr	m^2/m^2

SLA: Service Level Agreement.

SLIP (Serial Line Internet Protocol): An older protocol for IP connections over telephone lines, RS-232 cables, or other serial lines. The Point-to-Point Protocol (PPP) is replacing it.

Spawn action: A dividing action, where the enabled chains will not join. The enabled chains may interact and they may terminate separately. [ISO/IEC 10746, OMG UML]

Small Power Producer (SPP): Under the Public Utility Regulatory Policies Act (PURPA), a small power production facility (or small power producer) generates electricity using waste, renewable (water, wind and solar), or geothermal energy as a primary energy source. Fossil fuels can be used, but renewable resource must provide at least 75 percent of the total energy input. (See Code of Federal Regulations, Title 18, Part 292.) [**DOE Glossary of Electricity Terms]**

Smart Card: A digitally encoded card, similar to a credit card, usually containing a variety of information about the individual(s) authorized to use it. *Note:* The information can be accessed by a card reader into which the card is inserted. The information may include access codes (for opening doors), account numbers (merchant account numbers as well as banking account numbers), and electronic cash (which is withdrawn from the card as a purchase is made). From T1 Glossary 2000: Glossary of Telecommunications Terms.

SMB (Server Message Block): An application layer protocol for sharing files, printers, serial ports, and communications abstractions. It was developed by IBM and later enhanced by Microsoft and Intel. Microsoft has offered a public or open source version of SMB for the Internet to the IETF, called the Common Internet File System (CIFS).

SMI (Structure of Management Information): Defines the adapted subset of the OSI's Abstract Syntax Notation One, ASN.1 (ISO/IEC 8824), used to write MIB modules. SMI also assign a set of associated administrative values. SMI is part of the SNMP framework. SMIv2 is defined in RFC2578, RFC2579, and RFC2580.

Smiley: See emoticon. :-)

SMTP (Simple Mail Transfer Protocol): An application layer message transfer TCP/IP protocol. The Internet standard protocol for transferring electronic mail messages from one computer to another. SMTP specifies how two mail systems interact and the format of control messages they exchange to transfer mail. Defined in RFC2821 with message format description in RFC2822. See RFC1123 and MIME. See also RFC1652, RFC1870, RFC1891, RFC1893, RFC1894, RFC1985, RFC2034, RFC2476, RFC2487, RFC2505,

RFC2554, RFC2645, RFC2846, RFC2852, RFC2920, and RFC3030. Yahoo! Directory. Format.

Smurf DoS Attack: The two main components to the smurf denial-of-service attack are the use of forged ICMP echo request packets and the direction of packets to IP broadcast addresses. In the "smurf" attack, attackers are using ICMP echo request packets directed to IP broadcast addresses from remote locations to generate denial-of-service attacks. There are three parties in these attacks: the attacker, the intermediary, and the victim (note that the intermediary can also be a victim). The intermediary receives an ICMP echo request packet directed to the IP broadcast address of their network. If the intermediary does not filter ICMP traffic directed to IP broadcast addresses, many of the machines on the network will receive this ICMP echo request packet and send an ICMP echo reply packet back. When (potentially) all the machines on a network respond to this ICMP echo request, the result can be severe network congestion or outages. When the attackers create these packets, they do not use the IP address of their own machine as the source address. Instead, they create forged packets that contain the spoofed source address of the attacker's intended victim.

SNA (Systems Network Architecture): IBM network protocols originally developed for mainframes. More... and More...

Snail Mail: Mail sent through the US Post Office.

SNAP (SubNetwork Addressing Protocol): The SNAP protocol was introduced to allow an easy transition to the new Logical Link Control (LLC) frame format for vendors. SNAP allows older frames and protocols to be encapsulated in a Type 1 LLC header so making any protocol 'pseudo-IEEE compliant'. SNAP is described in RFC1042.

Sniffing: The process of monitoring data traveling over a network. Sniffing can be used both for legitimate network management functions and for stealing information off a network.

SNMP (Simple Network Management Protocol): The Transmission Control Protocol / Internet Protocol (TCP/IP) standard protocol that (a) is used to manage and control IP gateways and the networks to which they are attached, (b) uses IP directly, bypassing the masking effects of TCP error correction, (c) has direct access to IP datagrams on a network that may be operating abnormally, thus requiring management, (d) defines a set of variables that the gateway must store, and (e) specifies that all control operations on the gateway are a side-effect of fetching or storing those data variables, *i.e.*, operations that are analogous to writing commands and reading status. [From ANSI T1.523-2001]

SOAP (Simple Object Access Protocol): is a lightweight protocol for exchange of information in a decentralized, distributed environment. It is an XML-based protocol that consists of three parts: an envelope that defines a framework for describing what is in a message and how to process it, a set of encoding rules for expressing instances of application-defined datatypes, and a convention for representing remote procedure calls

and responses. Submitted to the W3C by Microsoft and IBM; Simple Object Access Protocol (SOAP) 1.1. See also UDDI and WSDL.

Socket Address: IP address together with a port number, separated by a semicolon.

SONET (Synchronous Optical NETwork): A set of standards developed by ANSI for high-speed data communication over fiber optic cable at speeds between 51.84 Mbps and 13 Gbps. .

Source-Route Translational Bridging: Sometimes referred to as SR/TLB, a method of bridging where source-route stations can communicate with transparent bridge stations with the help of an intermediate bridge that translates between the two bridge protocols.

Source-Route Transparent Bridging: A bridging scheme proposed by IBM that attempts to merge the two most prevalent bridging strategies (transparent and source-route bridging). SRT, as it is sometimes referred to, employs both technologies in one device to satisfy the needs of all end nodes. No translation between the bridging protocols is done, as compared to source-route translational bridging (SR/TLB).

Spam: A slang term, not to be confused with the meat product, which refers to the sending of hundreds if not thousands of unsolicited messages. Spam can be sent to newsgroups, mailing lists, and to individuals. Spam is highly frowned upon. Spam got its name from the Monty Python Flying Circus skit.

Special Protection System (SPS): an automatic protection system (also known as a remedial action scheme) designed to detect abnormal or predetermined system conditions, and take corrective actions other than and/or in addition to the isolation of faulted components to maintain system reliability. Such action may include changes in demand, generation (MW and Mvar), or system configuration to maintain system stability, acceptable voltage, or power flows. An SPS does not include (a) underfrequency or undervoltage load shedding or (b) fault conditions that must be isolated or (c) out-of-step relaying (not designed as an integral part of an SPS). (NERC "*Terms and Their Definitions As Used in the NERC Planning Standards*")

Spider: A program which scurries around the Internet collecting information about web sites and reporting that information back to a database. Spiders (or bots) are often used by search engines to index the web sites for later searching.

Spinning Reserve: That reserve generating capacity running at a zero load and synchronized to the electric system. [**DOE Glossary of Electricity Terms]**

Spot Purchases: A single shipment of fuel or volumes of fuel, purchased for delivery within 1 year. Spot purchases are often made by a user to fulfill a certain portion of energy requirements, to meet unanticipated energy needs, or to take advantage of low-fuel prices. [**DOE Glossary of Electricity Terms]**

Spoofing: see IP Spoofing.

Spread Spectrum Modulation: Spread Spectrum Modulation, which is a Physical Layer function, is a process in which the radio transceiver prepares the digital signal within the NIC for transmission over the airwaves. *Spread spectrum* "spreads" a signal's power over a wider band of frequencies, sacrificing bandwidth in order to gain signal-to-noise performance (referred to as process gain). This contradicts the desire to conserve frequency bandwidth, but the spreading process makes the data signal much less susceptible to electrical noise than conventional radio modulation techniques. Other transmission and electrical noise, typically narrow in bandwidth, will only interfere with a small portion of the spread spectrum signal, resulting in much less interference and less errors when the receiver demodulates the signal.

Spread Spectrum using Frequency Hopping: *Frequency hopping* works very much like its name implies. It takes the data signal and modulates it with a carrier signal that hops from frequency to frequency as a function of time over a wide band of frequencies. With frequency hopping spread spectrum, the carrier frequency changes periodically. The frequency hopping technique reduces interference because an interfering signal from a narrowband system will only affect the spread spectrum signal if both are transmitting at the same frequency at the same time. Thus, the aggregate interference will be very low, resulting in little or no bit errors. A frequency hopping radio, for example, will hop the carrier frequency over the 2.4 GHz frequency band between 2.4 GHz and 2.483 GHz.

Spread Spectrum - Direct Sequence: *Direct sequence spread spectrum* combines a data signal at the sending station with a higher data rate bit sequence, which many refer to as a *chipping code* (also known as *processing gain*). A high processing gain increases the signals resistance to interference. The minimum linear processing gain that the FCC allows is 10, and most commercial products operate under 20. The IEEE 802.11 Working Group has set their minimum processing gain requirements at 11. In comparison to frequency hopping, direct sequence can achieve much higher than 2 Mbps data rates.

SQL (Structured Query Language): SQL is used to query databases for specific information.

SSI (Server Side Includes): A popular extension to HTML. SSI allows the embedment of a number of special 'commands' into the HTML itself. All directives to the server are formatted as SGML comments within the document. The web server will then interpret the commands and execute them dynamically. Google Directory. Yahoo! Directory.

SSL (Secure Socket Layer): A Public Key Infrastructure (PKI) based protocol used for authenticated and encrypted communication between clients and servers developed by Netscape Communications. See also TLS.

SSTP (Double Shielded Twisted Pair): Cable with each pair enclosed in a foil wrap and the the entire four pairs enclosed in a braided sheath. Sometimes referred to as PiMF ("pairs in metal foil"). See Category 7.

Stability: The property that an object has with respect to a given failure mode if it cannot exhibit that failure mode. [ISO/IEC 10746, OMG UML]

State (of an object): At a given instant in time, the condition of an object that determines the set of all sequences of actions in which the object can take part. [ISO/IEC 10746, OMG UML]

Static schema: A specification of the state of one or more information objects, at some point in time, subject to the constraints of any invariant schemata. [ISO/IEC 10746, OMG UML]

Standalone Program: A program that does not interact with any other program.

Start Page: Also called the Home Page, it is the page that pops up when you first start up your web browser.

Stateless: Having no information about what occurred previously.

Stateful Inspection: Also referred to as dynamic packet filtering. Stateful inspection is a firewall architecture that operates at the network layer. Unlike static packet filtering, which examines a packet based on the information in its header, stateful inspection examines not just the header information but also the contents of the packet up through the application layers in order to determine more about the packet than just information about its source and destination. A stateful inspection firewall also monitors the state of the connection and compiles the information in a state table. Because of this, filtering decisions are based not only on administrator-defined rules (as in static packet filtering) but also on context that has been established by prior packets that have passed through the firewall.

Static Stability (Local Stability) - Ability of the system to maintain synchronous operation of the generating units with minor disturbance of the operating conditions (of a low amplitude and a low rate of increase).

Step: An abstraction of an action, used in a process, that may leave unspecified objects that participate in that action. [ISO/IEC 10746, OMG UML]

Store and Forward: Describes network operations where messages, packets, or frames are temporarily stored in one or more intermediate nodes before reaching their final destination.

STP (Shielded Twisted Pair): Twisted-pair cable enclosed in a foil or braid shield that protects against electromagnetic interference.

Stranded Costs: Prudent costs incurred by a utility which may not be recoverable under market-based retail competition. Examples are undepreciated generating facilities, deferred costs, and long-term contract costs. **[DOE Glossary of Electricity Terms]**

Stream: Contiguous sequence of bits, representing a stream of data, transmitted continuously over a communications path, serially (one at a time). Opposite to file.

Stream interface: An interface in which all the interactions are flows. [ISO/IEC 10746, OMG UML]

Stream interface signature: An interface signature for a stream interface. A stream interface comprises a finite set of action templates, one for each flow type in the stream interface. Each action template for a flow contains the name of the flow, the information type of the flow, and an indication of causality for the flow (i.e., producer or consumer but not both) with respect to the object which instantiates the template. [ISO/IEC 10746, OMG UML]

Stub: An engineering object in a channel, which interprets the interactions conveyed by the channel, and performs any necessary transformation or monitoring based on this interpretation. [ISO/IEC 10746, OMG UML]

Sub-activity: A subgraph of an activity which is itself an activity and which satisfies the following condition. For any pair of fork-join actions in the parent activity, if one of these actions is included in the subgraph, then both must be included in the subgraph. [ISO/IEC 10746, OMG UML]

Subclass/Superclass: One class A is a subclass of another class B, and B is a superclass of A, precisely when the type associated with A is a subtype of the type associated with B. [ISO/IEC 10746, OMG UML]

Subdomain: A domain which is a subset of a given domain. [ISO/IEC 10746, OMG UML]

Subnetwork: Collection of equipment and physical media, which can be used to interconnect other systems for the purpose of communications between them. Subnetworks may be interconnected with each other via network systems operating at the network layer or above.

Subnetwork Address: The information needed to identify a particular real system attached to a subnetwork (e.g., token ring adapter address).

Substation: Facility equipment that switches, changes, or regulates electric voltage. [**DOE Glossary of Electricity Terms]**

Subtype/Supertype: A type A is a subtype of a type B, and B is a supertype of A, if every <X> which satisfies A also satisfies B [ISO/IEC 10746, OMG UML].

Summarize: To encapsulate a number of responses into one coherent usable message. Often done on controlled mailing lists or active newsgroups, to help reduce bandwidth.

Supervisory Control and Data Acquisition System (SCADA) - refers to a system that acquires data from field devices and is used to issue control commands to devices. It is the primary system used by power system operators to monitor and control the power system.

Surfing the Internet: Slang for getting on the Internet and more specifically, browsing web pages.

Switch: Networking device that provide bridging functionality. See also Bridge.

Switching Station: Facility equipment used to tie together two or more electric circuits through switches. The switches are selectively arranged to permit a circuit to be disconnected, or to change the electric connection between the circuits. [**DOE Glossary of Electricity Terms]**

System: Something of interest as a whole or as comprised of parts. Therefore a system may be referred to as an entity. A component of a system may itself be a system, in which case it may be called a subsystem [ISO/IEC 10746, OMG UML].

System (Electric): Physically connected generation, transmission, and distribution facilities operated as an integrated unit under one central management, or operating supervision. [**DOE Glossary of Electricity Terms]**

Symmetric Key Cryptography: See Secret Key Cryptography

SYN: Is a control flag in the TCP protocol that attempts to synchronize TCP sequence numbers.

SYN Flood DoS Attack: When a system (called the client) attempts to establish a TCP connection to a system providing a service (the server), the client and server exchange a set sequence of messages. This connection technique applies to all TCP connections--telnet, Web, email, etc. The client system begins by sending a SYN message to the server. The server then acknowledges the SYN message by sending SYN-ACK message to the client. The client then finishes establishing the connection by responding with an ACK message. The connection between the client and the server is then open, and the service-specific data can be exchanged between the client and the server. Here is a view of this message flow:The potential for abuse arises at the point where the server system has sent an acknowledgment (SYN-ACK) back to client but has not yet received the ACK message. This is what we mean by half-open connection. The server has built in its system memory a data structure describing all pending connections. This data structure is of finite size, and it can be made to overflow by intentionally creating too many partially-open connections. Creating half-open connections is easily accomplished with IP spoofing. The attacking system sends SYN messages to the victim server system; these appear to be legitimate but in fact reference a client system that is unable to respond to the SYN-ACK messages. This means that the final ACK message will never be sent to the victim server system. The half-open connections data structure on the victim server

system will eventually fill; then the system will be unable to accept any new incoming connections until the table is emptied out. Normally there is a timeout associated with a pending connection, so the half-open connections will eventually expire and the victim server system will recover. However, the attacking system can simply continue sending IP-spoofed packets requesting new connections faster than the victim system can expire the pending connections. In most cases, the victim of such an attack will have difficulty in accepting any new incoming network connection. In these cases, the attack does not affect existing incoming connections nor the ability to originate outgoing network connections. However, in some cases, the system may exhaust memory, crash, or be rendered otherwise inoperative. The location of the attacking system is obscured because the source addresses in the SYN packets are often implausible. When the packet arrives at the victim server system, there is no way to determine its true source. Since the network forwards packets based on destination address, the only way to validate the source of a packet is to use input source filtering.

Synchronization - Operation that consists in connection of the generating unit to the power system or connection of different power systems after their frequencies, phases and voltages are equalized to reduce the disparity of the vectors of connected voltages to a value close to zero.

Synchronous Transmission: Data communications in which transmissions are sent at a fixed timing rate, with the sending and receiving devices synchronized.

Syntax: Grammar or structure rules, which must be adhered to by a language (e.g., a transfer syntax defines the formatting rules for transferring data from one system to another).

Sysop: The system operator of a BBS. It can also refer to anyone in charge of a system on the Internet.

System: 1. Any organized assembly of resources and procedures united and regulated by interaction or interdependence to accomplish a set of specific functions. 2. A collection of personnel, equipment, and methods organized to accomplish a set of specific functions.

System Integration: The progressive linking and testing of system components to merge their functional and technical characteristics into a comprehensive, interoperable system. Note: Integration of data systems allows data existing on disparate systems to be shared or accessed across functional or system boundaries.

T

T&D: Transmission and Distribution.

T-1 Line: A digital transmission line that carries up to 1.544 Mbps. See also DS-1.

T-2 Line: A digital transmission line that carries up to 6.312 Mbps. See also DS-2.

T2: Judgment Day, the sequel to the Terminator starring Arnold Schwarzenegger.

T-3 Line: A digital transmission line that carries up to 44.736 Mbps. See also DS-3.

T-4 Line: A digital transmission line that carries up to 274.176 Mbps. See also DS-4.

Tags: The coding used in HTML/SGML to instruct Web browsers on how to display text and images in a Web document. These tags usually operate in pairs surrounding the relevant material. For example, the beginning of a paragraph is signaled by the paragraph tag, <P>, while the end of a paragraph is marked by its matching end tag, </P>. Notice that the end tag is the same as the beginning tag, but with a forward slash mark inserted directly after the "less than" sign. This is typical of tags, though not universal. If your browser allows, you can look at the source coding in the files you view on the Web.

Target of Evaluation (TOE) - Defined in the ISO/IEC JTC 1 SC27 - Security (Common Criteria) from ISO/IEC 15408-1:1999(E) © ISO/IEC - An IT product or system and its associated administrator and user guidance documentation that is the subject of an evaluation.

TASE: Telecontrol Application Service Element

TASE.1: IEC TC57 WG07 standardized the protocol ELCOM. However, this protocol has been rarely used, and TASE.2 is used in its place.

TASE.2: IEC TC57 WG07 standardized the Intercontrol Center Communications Protocol (ICCP) as TASE.2. See ICCP.

TC (Transmission Customer): who bids for and purchases Available Transmission Capacity using the OASIS system.

TCO: (1) Total Cost of Ownership, a model that helps IT professionals understand and manage the budgeted (direct) and unbudgeted (indirect) costs incurred for acquiring, maintaining and using an application or a computing system. TCO normally includes training, upgrades, and administration as well as the purchase price. Lowering TCO through single-point control is a key benefit of Server-based Computing. (2)

Tjänstemännens Central Organisation, Swedish union for professionals. Publishes a standard for CRT emissions.

TCP (Transmission Control Protocol): A transport protocol in the TCP/IP protocol suite.

TCP/IP (Transmission Control Protocol/Internetworking Protocol): A five-layer suite of hierarchical protocols used in an internet.

TDM (Time Division Multiplexing): TDM is a scheme in which numerous signals are combined for transmission on a single communications line or channel. Each signal is broken up into many segments, each having very short time duration. TDM allocates either the same size time windows (synchronous TDM) or variable size time windows (asynchronous TDM). See also FDM.

TDMA (Time Division Multiple Access): TDMA is used by communication systems which require access by many different users at the same time. These systems are based on a time division multiplexing (TDM) scheme with access assigned to users as needed. In particular, satellite systems, digital cellular phone systems, and some state-of-the-art mobile radio systems use TDMA.

Technology viewpoint: A viewpoint on an ODP system and its environment that focuses on the choice of technology in that system. [ISO/IEC 10746, OMG UML]

TELNET (Terminal Network): An application layer terminal TCP/IP protocol used to connect and access programs and files on a remote server (remote access). Defined in RFC854.

<X> Template: The specification of the common features of a collection of <X>s in sufficient detail that an <X> can be instantiated using it. <X> can be anything that has a type. [ISO/IEC 10746, OMG UML]

Template class (of an <X>): The set of all <X>s satisfying an <X> template type, i.e. the set of <X>s which are instances of the <X> template. <X> can be anything that has a type. [ISO/IEC 10746, OMG UML]

Template type : A predicate defined in a template that holds for all the instantiations of the template and that expresses the requirements the instantiations of the template are intended to fulfill. [ISO/IEC 10746, OMG UML]

Term: A linguistic construct which may be used to refer to an entity. [ISO/IEC 10746, OMG UML]

Terminal Server: A small, specialized, networked computer that connects many terminals to a LAN through one network connection. Any user on the network can then connect to various network hosts.

Terminating behavior: The behavior which breaks down a liaison and repudiates the corresponding contractual context and the corresponding contract [ISO/IEC 10746, OMG UML].

Testing: The truth of a statement in an implementation can only be determined by testing and is based on a mapping from terms in the specification to observable aspects of the implementation. [ISO/IEC 10746, OMG UML]

Text File: A file that consist only of ASCII characters.

TFTP (Trivial File Transfer Protocol): An application layer TCP/IP protocol for file transfer, which does not require complex interaction between client and server. It is often used by servers to boot diskless workstations, X-terminals, and routers. Defined in RFC1350 with updates in RFC1785, RFC2347, RFC2348, and RFC2349. See RFC1123. See UDP/IP. Google directory. Format.

Thick Ethernet: see 10Base5.

Thin Client: A low-cost computing device that works in a server-centric computing model. Thin clients typically do not require state-of-the-art, powerful processors and large amounts of RAM and ROM because they access applications from a central server or network. Thin clients can operate in a Server-based Computing environment.

Thin Ethernet: see 10Base2.

Thread: A chain of actions, where at least one object participates in all the actions of the chain. [ISO/IEC 10746, OMG UML]

Threaded Messages: On newsgroups, mailing lists, and even normal e-mail, threaded messages are messages that follow a specific conversation about a subject.

Throughput: The number of bits that can pass through a point in one second.

TIA (Telecommunications Industry Association): Telecommunications Industry Association is the leading trade association in the communications and information technology industry with proven strengths in market development, trade promotion, trade shows, domestic and international advocacy, standards development and enabling e-business. Through its worldwide activities, the association facilitates business development opportunities and a competitive market environment. TIA provides a market-focused forum for its more than 1,100 member companies that manufacture or supply the products and services used in global communications. See http://www.tiaonline.org

TLS: Transport Layer Security

Time to Live (TTL): See packet lifetime.

Timestamp: An attribute of an object that contains the date and time when the value of the object was last updated.

Timestamping: A field that contains the time that the data was measured or received.

TO: Transmission Owner

Token: A "token" is an authentication tool, a device utilized to send and receive challenges and responses during the user authentication process. Tokens may be small, hand-held hardware devices similar to pocket calculators or credit cards. See key.

Token Bus: A LAN using a bus topology and a token passing access method. An IEEE 802.4 standard.

Token Ring: A LAN using typically a star topology and a token passing access method. An IEEE 802.5 standard. More... and More... IPv6 over Token Ring; RFC 2470.

Total Demand Distortion (TDD): the total root-sum-square harmonic current distortion, in percent of the maximum demand load current (15 or 30 min demand). [**IEEE P1547 Standard for Interconnecting Distributed Resources with Electric Power Systems**]

Total Rated-current Distortion (TRD): the total root-sum-square of the current harmonics created by the DR unit operating into a linear balanced load divided by the greater of the load current demand (IL) or the rated current capacity of the DR unit (Irated). [**IEEE P1547 Standard for Interconnecting Distributed Resources with Electric Power Systems**]

TP (Transmission Provider): offers Available Transmission Capacity for purchase on the OASIS system.

Trace: A record of an object's interactions, from its initial state to some other state. [ISO/IEC 10746, OMG UML]

Trading: The interaction between objects in which information about new or potential contracts is exchanged via a third party object. Trading involves: a) exporting: the provision of an identifier to an interface which is claimed to meet some statement of requirements (i.e. offer a potential contract); b) importing: the provision of an identifier to an interface which matches a given statement of requirements, allowing a future binding behavior to take place (i.e. the establishment of a contract). [ISO/IEC 10746, OMG UML]

Transaction transparency: A distribution transparency which masks coordination of activities amongst a configuration of objects to achieve consistency. [ISO/IEC 10746, OMG UML]

TransCo: Transmission Company.

Transformer: An electrical device for changing the voltage of alternating current. [**DOE Glossary of Electricity Terms]**

Transmission: The movement or transfer of electric energy over an interconnected group of lines and associated equipment between points of supply and points at which it is transformed for delivery to consumers, or is delivered to other electric systems. Transmission is considered to end when the energy is transformed for distribution to the consumer. [**DOE Glossary of Electricity Terms]**

Transmission System (Electric): An interconnected group of electric transmission lines and associated equipment for moving or transferring electric energy in bulk between points of supply and points at which it is transformed for delivery over the distribution system lines to consumers, or is delivered to other electric systems. [**DOE Glossary of Electricity Terms]**

Transmitting Utility: This is a regulated entity which owns, and may construct and maintain, wires used to transmit wholesale power. It may or may not handle the power dispatch and coordination functions. It is regulated to provide non-discriminatory connections, comparable service, and cost recovery. According to EPACT, this includes any electric utility, qualifying cogeneration facility, qualifying small power production facility, or Federal power marketing agency which owns or operates electric power transmission facilities which are used for the sale of electric energy at wholesale. [**DOE Glossary of Electricity Terms]**

Transport Layer Security (TLS): IETF recommendation based on SSL. It is a Public Key Infrastructure (PKI) based protocol used for authenticated and encrypted communication between clients and servers.

Transport Layer: In the OSI model, the network processing entity responsible, in conjunction with the underlying Network, Data Link, and Physical Layers, for the end-to-end control of transmitted data, error recovery, and the optimized use of network resources.

Trap Door: In the security world, a trap door is a bypass of security purposefully put in place as a means of access for authorized users.

Triple-X: Protocols that are used to connect a dumb terminal with an X.25 network. See also X.3, X.28, and X.29.

Triple DES: DES run 3 times.

Trojan Horse: 1) Any program designed to do things that the user of the program did not intend to do or that disguises its harmful intent. 2) Program that installs itself while the user is making an authorized entry; and, then are used to break-in and exploit the system.

TSB (Telecommunications Systems Bulletin) is published by the TIA.

TTC (Total Transmission Capacity): The total amount of MW energy that can be transmitted across a particular transmission line or path.

Turbine: A machine for generating rotary mechanical power from the energy of a stream of fluid (such as water, steam, or hot gas). Turbines convert the kinetic energy of fluids to mechanical energy through the principles of impulse and reaction, or a mixture of the two. [**DOE Glossary of Electricity Terms]**

Twisted Pair Ethernet: see 10Base-T, 100Base-T, and 1000BASE-T.

Twisted Pair: Cable made up of a pair of insulated copper wires wrapped around each other to cancel the effects of electrical noise.

Two-Factor Authentication: Two-factor authentication is based on something a user knows (factor one) plus something the user has (factor two). In order to access a network, the user must have both "factors" - just as he/she must have an ATM card and a Personal Identification Number (PIN) to retrieve money from a bank account, In order to be authenticated during the challenge/response process, users must have this specific (private) information.

Type (of an <X>): A predicate characterizing a collection of <X>s. An <X> is of the type, or satisfies the type, if the predicate holds for that <X>. In RM-ODP, types are needed for, at least, objects, interfaces and actions. [ISO/IEC 10746, OMG UML]

U

UBE: Unsolicited Bulk Email: Email messages received but not requested from no one in particular about nothing in particular addressed to many, many people.

UCA™ (Utility Communications Architecture): comprising a set of communication protocols specified and/or developed for utilities. UCA version 2 protocol suites are oriented to RTUs and IEDs in substation and distribution automation. The ICCP (TASE .2) protocol suite is oriented for the exchange of real-time data between control center systems or other utility systems.

UCE: Unsolicited Commercial Email: Email messages received but not requested from a company or person trying to sell something.

UCTE - Union of Electric Energy Transmission Co-ordination that organizes system operators of Western and Central Europe whose systems cooperate synchronously.

UDDI (Universal Description, Discovery, and Integration): a project initiative by Ariba, IBM, and Microsoft, that creates a global, platform-independent, open framework to enable businesses to (1) discover each other, (2) define how they interact over the Internet, and (3) share information in a global registry that will more rapidly accelerate the global adoption of B2B eCommerce. The UDDI registry is provided as a web service. The UDDI specifications uses; e.g., XML, HTTP, DNS, and SOAP.

UDP (User Datagram Protocol): A connectionless transport layer protocol in the TCP/IP suite.

UML (Unified Modeling Language): UML is a graphical language, sponsored by OMG, that expresses program design in a standard way, allowing design tools to interchange models (using XMI). It's an object-oriented language that standardizes an impressive number of diagram types including; e.g., Class and Object diagrams, Structure diagrams, and Use Case diagrams. See also CORBA. More... Google Directory.

UN/CEFACT: United Nations Centre for Trade Facilitation and Electronic Business. It is open to participation from Member States, intergovernmental organizations, and sectoral and industry associations recognized by the Economic and Social Council of the United Nations (ECOSOC). The Centre's objective is to be "inclusive" and it actively encourages organizations to contribute and help develop its recommendations and standards. http://www.unece.org/cefact

Unavoidable Forces - Sudden, unforeseeable events remaining beyond control of the parties, preventing in all or in part the compliance with the contractual obligations for a specific period or for good, that cannot be prevented in spite of a due diligence exercised

by the parties. The events recognized as the unavoidable forces are in particular as follows:

a) natural disasters, including fire, flood, drought, earthquake, hurricane, hoar-frost;
b) acts of the State authorities, including martial law, embargoes, blockades, etc.;
c) warfare, acts of sabotage;
d) general strikes or other social unrests, including public demonstrations, lockouts.

Unbinding behavior: A behavior that terminates a binding, i.e. a terminating behavior for the binding. [ISO/IEC 10746, OMG UML]

Unbundling: The separating of the total process of electric power service from generation to metering into its component parts for the purpose of separate pricing or service offerings. [**DOE Glossary of Electricity Terms]**

Unguided Medium: A wireless transmission medium with no physical boundaries; e.g., radio.

Unicode: Global character encoding schema. Unicode provides a unique number for every character, no matter what the platform, program, or language. Unicode is required by modern standards such as HTML (RFC2070), XML, Java, ECMAScript, LDAP, and CORBA. Standardized in ISO/IEC 10646-1:2000. RFC2277 recommends the use of ISO 10646/Unicode to all new Internet protocols. Compare with ASCII.

Uninterruptible Power Supply (UPS): An uninterruptible power supply (UPS) is a device that allows key equipment to keep running for at least a short time when the primary power source is lost. It also often provides protection from power surges. A UPS can be sized for individual computer systems or entire operations centers. It usually consists of a battery system that instantaneously provides power when the UPS senses a loss of power from the primary source, and sometimes a generator which can pick up the load within a few minutes. Typically the generator is a diesel engine, but other options include microturbines, fuel cells, and gas turbines, depending upon the size of the load and other factors.

Universal Time: Universal Time (UT). 1. The basis for coordinated dissemination of time signals, counted from 0000 at midnight. 2. In celestial navigation applications, the time which gives the exact rotational orientation of the Earth obtained from UTC by applying increments determined by the U.S. Naval Observatory. 3. A measure of time that conforms, within a close approximation, to the mean diurnal rotation of the Earth and serves as the basis of civil timekeeping. *Note:* Universal Time (UT1) is determined from observations of the stars, radio sources, and also from ranging observations of the Moon and artificial Earth satellites. The scale determined directly from such observations is designated Universal Time Observed (UTO); it is slightly dependent on the place of observation. When UTO is corrected for the shift in longitude of the observing station

caused by polar motion, the time scale UT1 is obtained. When an accuracy better than one second is not required, Universal Time can be used to mean Coordinated Universal Time (UTC). *Synonym [in the DoD]* Zulu Time. [JP 1-02] 4. The official civil time of the United Kingdom. *Formerly called* Greenwich Mean Time. [From ANSI T1.523-2001]

UNIX: An operating system available for a wide range of computers. It is commonly referred to as the "operating system" of the Internet.

Unsolicited Message: Message transmitted in response to a locally occurring event, rather than an explicit remote request. Usually a Client requests a Server to start sending unsolicited messages whenever certain client-specified events occur.

Upload: To transfer a file from the local computer to a remote computer, normally done with ftp. The opposite is to download.

URI (Uniform Resource Identifier): The generic set of all names/addresses that are short strings that refer to resources.

URL (Uniform Resource Locator): An informal term (no longer used in technical specifications) associated with popular URI schemes: http, ftp, mailto, etc.

URN (Uniform Resource Name). (1) An URI that has an institutional commitment to persistence, availability, etc. Note that this sort of URI may also be a URL. See, for example, PURLs. (2) A particular scheme, URN:, specified by RFC2141 and related documents, intended to serve as persistent, location-independent, resource identifiers.

USENET (Newsgroups): Usenet is a worldwide distributed discussion system. It consists of over 30,000 news servers (or newsgroups) with names that are classified hierarchically by subject. "Articles" or "messages" are "posted" to these newsgroups by people on computers with the appropriate software -- these articles are then broadcast to other interconnected computer systems via a wide variety of networks. Over 10 Gigabytes of data is posted daily. news:

User - Any person, software application, or system that interacts directly with another computer system.

User ID: A unique character string that identifies users. The name a person uses to access a system during authentication. This name is often part, or complete e-mail address as well.

User Identification: User identification is the process by which a user identifies himself to the system as a valid user. (As opposed to authentication, which is the process of establishing that the user is indeed that user and has a right to use the system.)

User Interface: The part of an application that the user works with. User interfaces can be text-driven, such as DOS, or graphical, such as Windows.

Utility Distribution Companies (UDC): The entities that will continue to provide regulated services for the distribution of electricity to customers and serve customers who do not choose direct access. Regardless of where a consumer chooses to purchase power, the customer's current utility, also known as the utility distribution company, will deliver the power to the consumer's home, business, or farm. [**DOE Glossary of Electricity Terms]**

UTP (Unshielded Twisted Pair): A cable that is twisted together to reduce noise and crosstalk

UUCP (Unix to Unix Copy Program): A store-and-forward system primarily for Unix systems but currently supported on other platforms.

Uuencode: An older method of encoding non-ASCII data for transmission over the Internet. Still used a lot in newsgroups, most newsreaders now automate the process although there are still times when one may require a UUdecoder.

V

V Series: Data transmission standards for telephone lines created by the ITU-T (formerly known as CCITT). More...

V.10: An ITU-T interface recommendation; electrically similar to RS-423 (unbalanced, high speed). More...

V.11: An ITU-T interface recommendation; electrically similar to RS-422. More...

V.110: Async rate adaption (for ISDN) at speeds up to 19.2 Kbps. More...

V.120: Async rate adaption (for ISDN) at speeds up to 64 Kbps; uses statistical multiplexing. More...

V.17: An ITU-T standard 2-wire modem for facsimile applications with rates up to 14 400 bit/s. More...

V.21: An ITU-T standard 300 bps duplex modem standardized for use in the general switched telephone network; similar to RS-422 and Bell 103. More...

V.22: An ITU-T standard 1200 bps duplex modem standardized for use in the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits; similar to Bell 212. More...

V.22bis: An ITU-T standard 2400 bps duplex modem using the frequency division technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits. More...

V.23: An ITU-T standard 600/1200-baud modem standardized for use in the general switched telephone network; similar to Bell 202. More...

V.24: An ITU-T standard interface recommendation that defines interchange circuits; similar to and operationally compatible with RS-232. More info.

V.25: An ITU-T standard automatic answering equipment and general procedures for automatic calling equipment on the general switched telephone network including procedures for disabling of echo control devices for both manually and automatically. More...

V.25bis: An ITU-T standard synchronous and asynchronous automatic dialing procedures on switched networks. More...

V.26: An ITU-T standard 2400 bps modem standardized for use on 4-wire leased telephone-type circuits; similar to Bell 201 B. More info.

V.26bis: An ITU-T standard 2400/1200 bps modem standardized for use in the general switched telephone network; similar to Bell 201 C. More...

V.26ter: An ITU-T standard 2400 bps duplex modem using the echo cancellation technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits. More...

V.27: An ITU-T standard 4800 bps modem with manual equalizer standardized for use on leased telephone-type circuits; similar to Bell 208A. More...

V.27bis: An ITU-T standard 4800/2400 bps modem with automatic equalizer standardized for use on leased telephone-type circuits. More...

V.27ter: An ITU-T standard 4800/2400 bps modem standardized for use in the general switched telephone network; similar to Bell 208 B; used for 4800-bps fax communication. More...

V.28: An ITU-T interface recommendation that defines electrical characteristics for the interchange circuits defined by V.24; similar to and operationally compatible with RS-232. More...

V.29: An ITU-T standard 9600 bps modem standardized for use on point-to-point 4-wire leased telephone-type circuits; similar to Bell 209; used for 9600-bps fax communication. More...

V.32: An ITU-T family of 2-wire, duplex modems operating at data signaling rates of up to 9600 bps for use on the general switched telephone network and on leased telephone-type circuits. More...

V.32bis: An ITU-T standard duplex modem operating at data signaling rates of up to 14 400 bps for use on the general switched telephone network and on leased point-to-point 2-wire telephone-type circuits. More info.

V.34: An ITU-T standard modem operating at data signaling rates of up to 33 600 bps for use on the general switched telephone network and on leased point-to-point 2-wire telephone-type circuits. More...

V.36: An ITU-T standard modems for synchronous data transmission using 60-108 kHz group band circuits; replaced V.35. More...

V.42: An ITU-T standard for an error-correction protocol for modems using an async-to-sync conversion; defines LAP-M protocol. More...

V.42bis: An ITU-T standard for a protocol, based on V.42 with added data compression. More...

V.54: An ITU-T standard describing loop test devices for modems. More...

V.90: An ITU-T standard digital modem and analogue modem pair for use on the Public Switched Telephone Network (PSTN) at data signaling rates of up to 56 000 bps downstream and up to 33 600 bps upstream. More...

V.Fast: A preliminary version of V.34 operating at signaling rates of up to 28 800 bps.

Value of Lost Load (VOLL) - measures the inconvenience, damage and replacement costs that customers incur when service in curtailed or interrupted.

VB: (Visual Basic) Microsoft programming language. More...

VBA (Visual Basic for Applications): Microsoft development technology for rapidly customizing rich-client desktop packaged applications and integrating them with existing data and systems. VBA offers a set of programming tools based on the Microsoft Visual Basic development system. More...

VBScript: Microsoft scripting language for use in browsers. See also JavaScript.

VDSL: Very high bit rate Digital Subscriber Line is similar to ADSL. It uses coaxial, fiber-optic, or twisted-pair cables for short distance (300 – 1800 meters). The downstream bit range is 50-55 Mbps and the upstream is 1.5-2.5 Mbps. See also xDSL.

Veronica: A Gopher service that provides keyword searching of gopher menu items.

Vertical Integration: An arrangement whereby the same company owns all the different aspects of making, selling, and delivering a product or service. In the electric industry, it refers to the historically common arrangement whereby a utility would own its own generating plants, transmission system, and distribution lines to provide all aspects of electric service. **[DOE Glossary of Electricity Terms]**

<Viewpoint> language: Definitions of concepts and rules for the specification of an ODP system from the <viewpoint> viewpoint; thus: engineering language: definitions of concepts and rules for the specification of an ODP system from the engineering viewpoint. [ISO/IEC 10746, OMG UML]

VHF (Very High Frequency): Radio waves in the 30 MHz to 300 MHz range using line-of-sight propagation.

VINES (Virtual Integrated Network Service), Banyan's VINES is a proprietary protocol family derived from the Xerox's XNS protocols. The Banyan suite includes the following protocols: VARP - VINES Address Resolution Protocol, VIP - VINES Internet

Protocol, ICP - Internet Control Protocol, RTP - Routing Update Protocol, IPC - InterProcess Communications Protocol, SPP - Sequenced Packet Protocol, NetRPC - NetRemote Procedure Call, and StreetTalk. More...

Violation: An action contrary to a rule. [ISO/IEC 10746, OMG UML]

Virtual circuit: In packet switching, a network facility that gives the appearance to the user of an actual end-to-end circuit; a dynamically variable network connection where sequential data packets may be routed differently during the course of a virtual connection. Virtual circuits enable transmission facilities to be shared by many users simultaneously.

Virtual Private Network (VPN): A VPN (virtual private network) is a way to use a public telecommunication infrastructure, such as the Internet, to provide remote offices, individual users, or remote field locations with secure access to their organization's network. A virtual private network can be contrasted with an expensive system of owned or leased lines that can only be used by one organization. The goal of a VPN is to provide the organization with the same capabilities, but at a much lower cost. A VPN works by using the shared public infrastructure while maintaining privacy through security procedures and tunneling protocols such as the Layer Two Tunneling Protocol (L2TP). In effect, the protocols, by encrypting data at the sending end and decrypting it at the receiving end, send the data through a "tunnel" that cannot be "entered" by data that is not properly encrypted. An additional level of security involves encrypting not only the data, but also the originating and receiving network addresses. VPNs provide security router-to-router, but do not provide application-to-application security.

Virus: A program designed to replicate itself without the users knowledge on that user's computer. Often these viruses are destructive to the user's computer. Virus protection should always be installed on a computer to prevent infection.. A virus is a piece of programming code usually disguised as something else that causes some unexpected and usually undesirable event. A virus is often designed so that it is automatically spread to other computer users. Viruses can be transmitted as attachments to an e-mail note, as downloads, or be present on a diskette or CD. The source of the e-mail note, downloaded file, or diskette you've received is often unaware of the virus. Some viruses wreak their effect as soon as their code is executed; other viruses lie dormant until circumstances cause their code to be executed by the computer. Some viruses are playful in intent and effect ("Happy Birthday, Ludwig!") and some can be quite harmful, erasing data or causing your hard disk to require reformatting. Generally, there are three main classes of viruses:

Visual Basic: Microsoft programming language.

VLAN (Virtual Local Area Network): Virtual LANs on the same physical LAN

VLF (Very Low Frequency): Radio waves in the 3 KHz to 30 KHz range using surface propagation.

VLSM: Variable Length Subnet Masks

Voltage Deviation - Slow change of the voltage taking place with a rate of less than 1% of the rated voltage per second.

Voltage Oscillations - Short-term changes of voltage taking place with a rate of more than 1 % of the rated voltage per second.

Voltage Reduction: Any intentional reduction of system voltage by 3 percent or greater for reasons of maintaining the continuity of service of the bulk electric power supply system. [**DOE Glossary of Electricity Terms]**

VSAT (Very Small Aperture Terminal): transceiver for satellite communications.

VT100: A standard terminal type developed by Digital Equipment, supported by many computer systems, and emulated by many terminals or personal computers which are not themselves VT100 terminals.

W

W3C: see World Wide Web Consortium (W3C)

WAIS (Wide Area Information Servers):: Like Gopher, a wide area information service, used for accessing Government data.

WAN (Wide-Area Network): A network that serves an area of hundreds or thousands of miles, using common-carrier-provided lines; contrast with LAN. WAN Protocols.

Watt: The electrical unit of power. The rate of energy transfer equivalent to 1 ampere flowing under a pressure of 1 volt at unity power factor. [**DOE Glossary of Electricity Terms]**

Watthour (Wh): An electrical energy unit of measure equal to 1 watt of power supplied to, or taken from, an electric circuit steadily for 1 hour. [**DOE Glossary of Electricity Terms]**

WDSL Wireless Digital Subscriber Line, utilizes fixed wireless technologies such as MMDS or 802.11. Unlike other forms of DSL, WDSL is a shared medium. Downstream speeds typically starts at 384kbps-1.5M and upstream at 128kbps. See also xDSL.

Web Browser: An application that displays a Web page. Also known as a browser. Internet Explorer and Netscape are examples of web browsers.

Web Page: A HTML document that you open in a web browser that contains text, graphics and small programs called applets, plug-ins, or controls.

Web Quest: A learning activity in which some or all of the information that students interact with comes from sites on the Internet.

Web Server: A computer program that "serves" web sites. A web server specifically is designed to primarily work with the protocol HTTP. One of the first was named httpd, developed at NCSA. Apache, Netscape, and Microsoft IIS are the most popular web servers. See also WWW.

Web Site: A particular place on the World Wide Web devoted to a particular company or subject that has the same Internet address.

Webmaster: A person that creates, maintains, and/or is responsible for a particular web site.

Wheeling Service: The movement of electricity from one system to another over transmission facilities of intervening systems. Wheeling service contracts can be established between two or more systems. [**DOE Glossary of Electricity Terms]**

White-hat Hackers: Experts hired to try and defeat security measures as a means to detect security vulnerabilities so they can be corrected.

Wholesale Competition: A system whereby a distributor of power would have the option to buy its power from a variety of power producers, and the power producers would be able to compete to sell their power to a variety of distribution companies. [**DOE Glossary of Electricity Terms]**

Wholesale Sales: Energy supplied to other electric utilities, cooperatives, municipals, and Federal and State electric agencies for resale to ultimate consumers. [**DOE Glossary of Electricity Terms]**

Wholesale Power Market: The purchase and sale of electricity from generators to resellers (who sell to retail customers), along with the ancillary services needed to maintain reliability and power quality at the transmission level. [**DOE Glossary of Electricity Terms]**

Wholesale Transmission Services: The transmission of electric energy sold, or to be sold, at wholesale in interstate commerce (from EPACT). [**DOE Glossary of Electricity Terms]**

Wi-Fi: Short for wireless fidelity This is another name for IEEE 802.11b. It is a trade term promulgated by the Wireless Ethernet Compatibility Alliance (WECA). "Wi-Fi" is used in place of 802.11b in the same way that "Ethernet" is used in place of IEEE 802.3. Products certified as Wi-Fi by WECA are interoperable with each other even if they are from different manufacturers. A user with a Wi-Fi product can use any brand of Access Point with any other brand of client hardware that is built to the Wi-Fi standard.[From cms.syr.edu]

Windows: Collective name for Microsoft's desktop and server operating systems. Includes Windows 2000, Windows NT, and Windows XP.

Windows 2000: Operating system from Microsoft, aka Windows NT 5.0.

Windows DNA (Microsoft® Windows® Distributed interNet Applications Architecture): is an application architecture to fully embrace and integrate the Internet, client/server, and PC models of computing for a new class of distributed computing solutions. The heart of Windows DNA is the integration of Web and client/server application development models through the COM.

Windows NT : (New Technology) Operating system from Microsoft. See also Windows 2000.

Windows XP: (eXPerience) Operating system from Microsoft. Merges Windows 98/Me with Windows 2000.

Winsock (Windows Socket): The standard by which Windows Internet programs communicate with the TCP/IP protocol.

Wires Charge: A broad term which refers to charges levied on power suppliers or their customers for the use of the transmission or distribution wires. [**DOE Glossary of Electricity Terms]**

Wizard: Similar to guru, although a wizard usually is extremely good at one particular program or computer.

WLAN: Wireless LAN

WML (Wireless Markup Language): is a markup language based on XML, and is intended for use in specifying content and user interface for narrowband devices, including cellular phones and pagers. WML is designed with the constraints of small narrowband devices in mind.

WMS (Work Management System): schedules personnel and other utility resources.

Workstation: A networked personal computing device with more power than standard IBM PC or Macintosh. Typically, a workstation has an operating system such as UNIX that is capable of running several tasks at the same time. However, the line between PCs and workstations are becoming more and more difficult to define.

World Wide Web (WWW): A multimedia Internet service using primarily the HTTP protocol and the HTML language. It is usually referred to simply as "the Web." The Web is differentiated from gopher and other text-only protocols by its "graphic user interface" (GUI) that allows the joining of text and images on individuals Web pages. Since 1993, it is the largest Internet service. It currently accounts for over 85% of all Internet traffic.

World Wide Web Consortium (W3C): Organization founded in October 1994 by Tim Berners-Lee at the Massachusetts Institute of Technology, Laboratory for Computer Science [MIT/LCS] in collaboration with CERN with support from DARPA and the European Commission. The organization was created to lead the World Wide Web to its full potential by developing common protocols that promote its evolution and ensure its interoperability. W3C has more than 500 Member organizations from around the world. http://www.w3.org See also WWW.

Worm: A computer virus, which replicates itself. The Internet worm was perhaps the most famous; it successfully (and accidentally) duplicated itself on many of the systems across Internet.

WRT: with respect to

WSDL (Web Services Description Language): WSDL is the standard that allows Web services enabled systems to tell each other what capabilities they have and what they can do. Once a system is described in WSDL, developers can create a rich interaction wherever it's needed, plugging in to programs or applications as part of the design process. The system that's providing the Web services doesn't necessarily know about the consuming service, it just serves up what it's told. See also XML, SOAP, and UDDI.

WTLS (Wireless Transport Layer Security): WTLS is the security layer of the WAP, providing privacy, data integrity and authentication for WAP services. It is based on the widely used TLS v1.0 security layer.

WYSIMOLWYG (What You See Is More Or Less What You Get): A common computer industry term for a computer or program which should be WYSIWYG, but does not quite make it. This is not a flattering description.

WYSIWYG (What You See Is What You Get): A computer industry term which indicates that the work you do on your screen will appear exactly the same when you print it on the printer.

X

X.121: ITU-T standard defining an international numbering plan for public data networks.

X.21: ITU-T standard defining the interface between a Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE).

X.21 bis: ITU-T standard defining the use on public data networks of DTE which is designed for interfacing to synchronous V-Series modems.

X.24: ITU-T list of definitions for interchange circuits between DTE and DCE on public data networks.

X.25: ITU-T standard defining the interface between DTE and DCE for terminals operating in the packet mode and connected to public data networks by dedicated circuit.

X.28: A Triple-X protocol defining DTE/DCE interface for a start-stop mode Data Terminal Equipment accessing the PAD in a public data network situated in the same country.

X.29: A Triple-X protocol defining procedures for the exchange of control information and user data between a PAD facility and a packet mode DTE or another PAD.

X.3: A Triple-X protocol that defines a PAD.

X.400: An ITU-T standard for electronic mail and message handling.

X.500: An ITU-T standard for directory service.

X.509: In cryptography, X.509 is an ITU-T standard for PKI (Public Key Infrastructure). X.509 specifies, amongst other things, standard formats for public key certificates. X.509 is part of the hierarchical X.500 standard and thus assumes a strict hierarchical system of certificate authorities (CAs) for issuing the certificates. This is in contrast to web of trust models, like PGP, where anyone (not just special CAs) may sign (and thus attest to the validity) of others' key certificates. The X.500 system have never been fully implemented, so the IETF's public-key infrastructure working group have made extensive updates to the standard in order to make it work with the more loose organization of the Internet. In fact today X.509 certificate usually refers to the X.509 v3 certificate specified in RFC 3280.

x2: 56K modem technology from 3Com (U.S. Robotics). See also V.90 and K56Flex.

xDSL: A term referring to a variety of new Digital Subscriber Line technologies. Some of these varieties are asymmetric with different data rates in the downstream and upstream directions. Others are symmetric. See also ADSL, HDSL, RADSL, SDSL, VDSL and WDSL.

XHTML (Extensible HyperText Markup Language): XHTML is a reformulation of HTML 4.01 in XML, and combines the strength of HTML 4 with the power of XML. XHTML 1.0 is the first major change to HTML since HTML 4.0 was released in 1997. It brings the rigor of XML to Web pages and is the keystone in W3C's work to create standards that provide richer Web pages on an ever increasing range of browser platforms including cell phones, televisions, cars, wallet sized wireless communicators, kiosks, and desktops.

XMI, (XML Metadata Interchange), is a stream format for interchange of metadata including UML models created during analysis and design activities. It is useful for transferring the model from one step to the next as the design and coding progress, or for transferring from one design tool to another. See also UML and CORBA.

XML (eXtensible Markup Language): XML, a formal recommendation from the World Wide Web Consortium (W3C), is similar to the language of today's Web pages, the Hypertext Markup Language (HTML). Both XML and HTML contain markup symbols to describe the contents of a page or file. HTML, however, describes the content of a Web page (mainly text and graphic images) only in terms of how it is to be displayed and interacted with. For example, the letter "p" placed within markup tags starts a new paragraph. On the other hand, XML describes the content in terms of what data is being described, so XML can be used to define meta-data. This means that an XML file can be processed purely as data by a program or it can be stored with similar data on another computer or, like an HTML file, that it can be displayed. XML is "extensible" because, unlike HTML, the markup symbols are unlimited and self-defining. XML is actually a simpler and easier-to-use subset of the Standard Generalized Markup Language (SGML), the standard for how to create a document structure.

XNS (Xerox Network System): The XNS protocols provide routing capability and support for both sequenced and connectionless packet delivery. Novell and 3Com 3Plus protocols use the lower layers of XNS for packet delivery. XNS includes the following protocols; IDP - Internet Datagram Protocol, RIP - Routing Information Protocol, PEP - Packet Exchange Protocol, and SPP - Sequenced Packet Protocol.

XSD (XML Schema Definition): XSD, a Recommendation of the World Wide Web Consortium (W3C), specifies how to formally describe the elements in an Extensible Markup Language (XML) document. This description can be used to verify that each item of content in a document adheres to the description of the element in which the content is to be placed. In general, a schema is an abstract representation of an object's characteristics and relationship to other objects. An XML schema represents the interrelationship between the attributes and elements of an XML object (for example, a document or a portion of a document). To create a schema for a document, you analyze

its structure, defining each structural element as you encounter it. For example, within a schema for a document describing a Web site, you would define a Web site element, a Web page element, and other elements that describe possible content divisions within any page on that site. Just as in XML and HTML, elements are defined within a set of tags.

XSL (Extensible Stylesheet Language): XSL is a language for expressing stylesheets defined by W3C. It consists of three parts: XSL Transformations (XSLT): a language for transforming XML documents, the XML Path Language (XPath), an expression language used by XSLT to access or refer to parts of an XML document. (XPath is also used by the XML Linking specification). The third part is XSL Formatting Objects: an XML vocabulary for specifying formatting semantics. An XSL stylesheet specifies the presentation of a class of XML documents by describing how an instance of the class is transformed into an XML document that uses the formatting vocabulary.

Y

Yoyo mode: A state in which a computer system rapidly alternates between working correctly (being up) and crashing (being down).

Z

Z: The common archive format for UNIX. gzip is the archive program used to create this.

zip: The common archive format for PCs. PkZip and WinZip are two popular programs that support this format.

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