Glossary

Supporting Fabric OS v5.1.0

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Brocade Glossary v4.1.2	53-0000369-02	Added FICON® terms.	October 2003
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Glossary

A

ACC Accept link service reply. The normal reply to an Extended Link Service request (such as FLOGI), indicating that the request has been completed.

active copper A Fibre Channel connection that allows copper cabling up to 33 meters (36 yards) between devices.

address identifier A 24-bit or 8-bit value used to identify the source or destination of a frame. *See also* D_ID, and S_ID.

AL_PA Arbitrated-loop physical address. A unique 8-bit value assigned during loop initialization to a port in an arbitrated loop.

AL_TIME Arbitrated-loop timeout value. Twice the amount of time it would take for a transmission word to propagate around a worst-case loop. The default value is 15 milliseconds (ms).

alias A logical grouping of elements in a fabric. An alias is a collection of port numbers and WWNs, used to simplify the entry of port numbers and WWNs when creating zones.

alias address identifier An address identifier recognized by a port in addition to its standard identifier. An alias address identifier can be shared by multiple ports. *See also* alias.

alias AL_PA An AL_PA value recognized by an L_Port in addition to the AL_PA assigned to the port. *See also* AL_PA.

alias object A name assigned to a device or group of devices to enable easy configuration of multiple devices in the zone database. *See also* zone object.

alias server A fabric software facility that supports multicast group management.

ARB Arbitrative primitive signal. Applies only to an arbitrated-loop topology. Transmitted as the fill word by an L_Port to indicate that the port is arbitrating access to the loop.

arbitrated loop A shared 100-Mbit/sec Fibre Channel transport structured as a loop. Can support up to 126 devices and one fabric attachment. *See also* topology.

arbitration A method of gaining orderly access to a shared-loop topology.

area number A logical numeric identifier for a physical port. In Brocade Fabric OS v4.0 and above, ports on a switch are assigned a logical port area number. Port area numbers can be viewed by entering the **switchShow** command. They are used to define the operative port for many Fabric OS commands: for example, area numbers can be used to define the ports within an alias or zone.

ARR Asynchronous response router. Refers to Management Server GS_Subtype Code E4, which appears in **portLogDump** command output.

ASIC Application-specific integrated circuit.

ATM Asynchronous Transfer Mode. A protocol for transmitting data over LANs or WANs that transmits fixed-length units of data. Provides any-to-any connectivity and allows SAN devices to transmit simultaneously.

authentication The process of verifying through a password that an entity in a fabric, such as a switch, should or should not have access to the fabric. *See also* digital certificate, and switch-to-switch authentication.

autocommit A feature of the **firmwareDownload** command. Enabled by default, autocommit commits new firmware to both the primary and secondary partitions of a CP. With autocommit disabled, the firmware is written only to the primary partition of a CP, enabling you to restore the previous firmware from the secondary partition.

AW_TOV Arbitration wait timeout value. The minimum time an arbitrating L_Port waits for a response before beginning loop initialization.

B

backbone fabric A backbone fabric can consist of a single- or multiple- Fibre Channel Routing Services capable switches that connect to each other directly or indirectly through other switches using E_Ports or VE_Ports. Two edge fabrics can communicate across a backbone fabric and share resources such as storage or servers, they are kept from merging into a single fabric. Edge fabrics can also share devices with backbone fabric with FR4-18i and vice-versa. *See also* Fibre Channel Routing Services, translate phantom domain, and phantom device.

backup FCS switch Relates to the Brocade Secure Fabric OS feature. The backup fabric configuration server serves as a backup in case the primary FCS switch fails. *See also* FCS switch, and primary FCS switch.

bandwidth The total transmission capacity of a cable, link, or system. Usually measured in bits/sec (bits per second). Can also refer to the range of transmission frequencies available to a link or system.

Basic User mode In Web Tools, a switch configuration that is set from the EZSwitchSetup CD. If Basic User mode is enabled, then entering the switch IP address in a browser window launches Web Tools EZ instead of Web Tools. Basic User mode is supported only on SilkWorm 200E and 3250 switches.

BB *See* backbone fabric.

BB fabric A backbone fabric that connects FC Routers. The FC Routers communicate over the backbone fabric using FCRP (Fibre Channel Router Protocol).

BB_Credit Buffer-to-buffer credit. The number of frames that can be transmitted to a directly connected recipient or within an arbitrated loop. Determined by the number of receive buffers available. *See also* buffer-to-buffer flow control, and EE_Credit.

beacon A tool in which all of the port LEDs on a switch are set to flash from one side of the switch to the other, to enable identification of an individual switch in a large fabric. A switch can be set to beacon by a Fabric OS command or through Web Tools.

BER Bit error rate. The rate at which bits are expected to be received in error. Expressed as the ratio of error bits to total bits transmitted. *See also* error.

BISR Built-in self-repair.

BIST Built-in self-test.

bit synchronization The condition in which a receiver is delivering retimed serial data at the required bit error rate.

blind-mate connector A two-way connector used in some Brocade SilkWorm switches to provide a connection between the motherboard and the power supply.

block As it applies to Fibre Channel technology, upper-level application data that is transferred in a single sequence.

Bloom A Brocade 2-Gbit/sec switch and director ASIC.

boot code Software that initialized the system environment during the early phase of the boot-up process. For example, boot code might determine the amount of available memory and how to access it.

boot flash Flash (temporary) memory that stores the boot code and boot.

bport Back-end port of the ASIC.

broadcast The transmission of data from a single source to all devices in the fabric, regardless of zoning. *See also* multicast, and unicast.

buffer-to-buffer flow control Management of the frame transmission rate in either a point-to-point topology or in an arbitrated loop. *See also* BB_Credit.

bypass circuitry Circuits that automatically remove a device from the data path when valid signals are dropped.

C

CAM Content-addressable memory.

CAN Campus area network. A network comprising a limited area but not just one building. *See also* LAN, MAN, and WAN.

canvas In Web Tools, a saved configuration of performance monitor graphs.

cascade Two or more interconnected Fibre Channel switches. Brocade SilkWorm 2000 and later switches can be cascaded up to 239 switches, with a recommended maximum of seven interswitch links (no path longer than eight switches). *See also* fabric, and ISL.

certificate authority A third party organization that provides secure public and private keys. To ease maintenance and allow secure out-of-band communication between switches, consider using one certificate authority (CA) to sign all management certificates for a fabric.

CHAP Challenge-Handshake Authentication Protocol. Allows remote servers and clients to securely exchange authentication credentials. Both the server and client are configured with the same shared secret.

chassis On a SilkWorm director, the metal frame in which the switch and switch components are mounted.

chassisConfig Mode On a SilkWorm Director, the **chassisConfig** mode determines the blade types enabled for use in the chassis. See the **chassisConfig** command in the *Fabric OS Command Reference Manual* for more information.

CIM Common Information Model. A management structure enabling disparate resources to be managed by a common application.

circuit An established communication path between two ports. Consists of two virtual circuits capable of transmitting in opposite directions.

Class 1 service The class of frame-switching service for a dedicated connection between two communicating ports (also called “connection-oriented service”). Includes acknowledgement of frame delivery or nondelivery.

Class 2 service A connectionless class of frame-switching service that includes acknowledgement of frame delivery or nondelivery.

Class 3 service A connectionless class of frame-switching service that does not include acknowledgement of frame delivery or nondelivery. Can be used to provide a multicast connection between the frame originator and recipients, with acknowledgement of frame delivery or nondelivery.

Class 4 service A connection-oriented service that allows fractional parts of the bandwidth to be used in a virtual circuit.

Class 6 service A connection-oriented multicast service geared toward video broadcasts between a central server and clients.

Class F service The class of frame-switching service for a direct connection between two switches, allowing communication of control traffic between the E_Ports. Includes acknowledgement of data delivery or nondelivery.

class of service A specified set of delivery characteristics and attributes for frame delivery.

CLI Command line interface. An interface that depends entirely on the use of typed commands, such as through a terminal connection, telnet, sectelnet, or SSH2, and does not involve a GUI. *See also GUI.*

client An entity that, using its common transport (CT), makes requests of a server.

CLS Close primitive signal. Used only in an arbitrated loop. Sent by an L_Port that is currently communicating in the loop, to close communication with another L_Port.

comma A unique pattern (either 1100000 or 0011111) used in 8b/10b encoding to specify character alignment within a data stream. *See also* K28.5.

community (SNMP) A relationship between a group of SNMP managers and an SNMP agent, in which authentication, access control, and proxy characteristics are defined. *See also* SNMP.

compact flash Volatile flash memory that is used in a manner similar to hard disk storage. It is connected to a bridging component that connects to the PCI bus of the processor. Not visible within the processor's memory space.

Condor A Brocade 4-Gbit/sec switch and director ASIC.

configuration (1) A set of parameters that can be modified to define the operational characteristics of a switch.

(2) In Brocade Zoning, a zoning object that contains a set of zones; this is analogous to a zone set used by other Fibre Channel switch vendors. *See also* zone configuration.

congestion The reduction of throughput below the requested amount either due to oversubscription within a fabric of switches or within a group of interconnected ASICs inside a switch. A congested link is an ISL on which multiple devices have collectively requested more throughput than the link supports at one time.

core PID The default PID mode for SilkWorm 200E, 3016, 3250, 3850, 3900, and 4100 switches and SilkWorm Directors, this is the recommended format for Brocade switches and fabrics. It uses the entire 8-bit address space and directly uses the port number as the area_ID. It supports up to 256 ports per switch. See also VC Encoded PID, native PID, and extended edge PID.

CP1 The first-generation director CP blade provided with the SilkWorm 12000. This CP supports 1- and 2-Gbit/sec port speeds. It supports only the dual domain configuration within the chassis.

CP2 The second-generation director CP blade provided with the SilkWorm 24000. This CP supports 1- and 2-Gbit/sec port speeds. It supports both a dual domain and a single domain configuration within the chassis.

CP4 The third-generation director CP blade provided with the SilkWorm 48000. This CP supports 1-, 2-, and 4-Gbit/sec port speeds, as well as 16 and 32-port 4-Gbit/sec blades. It also supports the FR4-18i blade when set to **chassisConfig** mode 5.

CRC Cyclic redundancy check. A check for transmission errors, included in every data frame.

credit As it applies to Fibre Channel technology, the number of receive buffers available to transmit frames between ports. *See also* BB_Credit, and EE_Credit.

CSCN Common services connection framework.

D

D_ID Destination identifier. A 3-byte field in the frame header, used to indicate the address identifier of the N_Port to which the frame is headed.

dark fiber A leased fiber optic cable running between sites characterized by not having a service provided on the wire by the leasing company. All services are provided by the customer.

DAS Direct attached storage.

data migration console DMC. The graphical user interface to the DMM appliance. *See also* DMM Appliance.

DCC Direct cable connection. DCC does not require network interface cards (NICs), making it relatively inexpensive and simple; however, it provides a limited connection between two PCs, and the data transfer rate is slower than with a true LAN.

dedicated simplex A connection method that permits a single N_Port to simultaneously initiate a session with one N_Port as an initiator and have a separate Class 1 connection to another N_Port as a recipient.

defined zone configuration The complete set of all zone objects defined in the zoning database. The zoning database is fabric wide, so includes all alias, zone, and configuration definitions for the entire fabric. Multiple zone configurations can be defined in the zone data, though only one can be active on the fabric. *See also* effective zone configuration, enabled zone configuration, and zone configuration.

deskew Related to the Brocade Trunking feature. The time difference between traffic traveling over each ISL other than the shortest ISL in the group and traffic traveling over that shortest ISL. The deskew number corresponds to nanoseconds divided by 10. The firmware automatically sets the minimum deskew value of the shortest ISL to 15.

device-based routing A routing policy in which the choice of routing path is based on the Fibre Channel addresses of the source device (S_ID) and the destination device (D_ID), improving path utilization for better performance. Thus, the same route is always used and the sequence of exchanges is guaranteed. *See also* port-based routing, and exchange-based routing.

DH-CHAP Diffie-Hellman Challenge-Handshake Authentication Protocol. An implementation of CHAP using Diffie-Hellman encryption. *See also* CHAP.

DHCP Dynamic Host Configuration Protocol.

DHCPD Dynamic Host Configuration Protocol daemon.

digital certificate An electronic document issued by a CA (certificate authority) to an entity, containing the public key and identity of the entity. Entities in a secure fabric are authenticated based on these certificates. *See also* authentication, and public key.

director A highly-available and scalable Fibre Channel switch that uses a chassis and blade architecture. Brocade SilkWorm 12000, 24000, and 48000 are examples of directors.

disparity The proportion of 1s and 0s in an encoded character. “Neutral disparity” means an equal number of each, “positive disparity” means a majority of 1s, and “negative disparity” means a majority of 0s.

DLS Dynamic load-sharing. Dynamic distribution of traffic over available paths. Allows for recomputing of routes when an Fx_Port or E_Port changes status. The device-based and exchange-based routing policies depend on the Fabric OS Dynamic Load Sharing feature (DLS) for dynamic routing path selection.

DMC Data migration console. The graphical user interface to the DMM appliance. *See also* DMM Appliance.

DMM Appliance A Brocade product that provides hardware-assisted data migration from one storage device to another across a SilkWorm switch. It enables the migration of data from multiple storage devices simultaneously across multiple fabrics. The software portion of the DMM appliance is layered onto the Brocade Storage Application Services (SAS). The DMM appliance requires either the SilkWorm AP7420 or the FR4-18i AP blade as a hardware platform. See also LU path, extent pair, and migration set.

domain controller A domain controller (or embedded port) communicates with and gets updates from other switches' embedded ports, in order to assign domain numbers to new switches that do not conflict with the domains numbers currently used the fabric. The well-known address is *fffcdd*, where *dd* = domain number.

domain ID A unique numeric identifier for each switch within a fabric, used in routing frames. Usually automatically assigned by the principal switch but can be assigned manually.

Dynamic load-sharing *See* DLS.

E

E_D_TOV Error-detect timeout value. The minimum amount of time a target waits for a sequence to complete before initiating recovery. Can also be defined as the maximum time allowed for a round-trip transmission before an error is declared. *See also* R_A_TOV, and RR_TOV.

E_Port A switch port that has been connected to another switch to form an ISL. *See also* ISL.

ECCN Export classification control number. A government classification of encryption. For example, SSH is in the high-encryption category (number 5x02) and therefore has certain restrictions regarding its transfer.

edge fabric A Fibre Channel fabric connected to an FC router or FR4-18i AP blade via an EX_Port.

EE_Credit End-to-end credit. The number of receive buffers allocated by a recipient port to an originating port. Used by Class 1 and 2 services to manage frame exchange across the fabric, between source and destination. *See also* BB_Credit, and end-to-end flow control.

effective zone configuration A subset of the defined zone configuration, containing only the zone configuration objects that are currently enabled. Only one configuration can be active at a time, but multiple configurations can be *defined* in the database. *See also* defined zone configuration.

EIA rack A storage rack that meets the standards set by the Electronics Industry Association (EIA).

ELP Exchange link parameters.

ELS Extended link service. ELSs are sent to the destination N_Port to perform the requested function or service. ELS is a Fibre Channel standard that is sometimes referred to as “Fibre Channel Physical (FC_PH) ELS.”

EM Environmental monitor. A daemon in the Fabric OS that monitors hardware components and FRUs and reports failures. *See also* FRU.

embedded port An embedded port (or domain controller) communicates and get updates from other switches' embedded ports. The well-known address is *fffcdd*, where *dd* = domain number.

EMI Electromagnetic interference.

enabled zone configuration The currently enabled configuration of zones. Only one configuration can be enabled at a time. *See also* defined zone configuration, and zone configuration.

end-to-end flow control Governs flow of Class 1 and 2 frames between N_Ports. *See also* EE_Credit.

entry fabric The basic Brocade software license that allows one E_Port per switch.

EOF End of frame. A group of ordered sets used to mark the end of a frame.

epair Extent pair. *See* extent pair, and DMM Appliance.

error As it applies to the Fibre Channel industry, a missing or corrupted frame, timeout, loss of synchronization, or loss of signal (link errors). *See also* loop failure.

Ethernet A popular LAN protocol.

EVMd Event management database. Delivers FDMI-related events.

EX_Port A type of E_Port that connects an FC router to an edge fabric. From the point of view of a switch in an edge fabric, an EX_Port appears as a normal E_Port. It follows applicable Fibre Channel standards as other E_Ports. However, the router terminates EX_Ports rather than allowing different fabrics to merge as would happen on a switch with regular E_Ports.

exchange The highest-level Fibre Channel mechanism used for communication between N_Ports. Composed of one or more related sequences, it can work in either one or both directions.

exchange-based routing A routing policy in which the choice of routing path is based on the S_ID, D_ID, and Fibre Channel originator exchange ID (OX_ID), optimizing path utilization for the best performance. Thus, every exchange can take a different path through the fabric. This routing policy is default on the SilkWorm 200E, 4100, 4900, AP7420, 7500, and 48000 (using configuration option 5). *See also* device-based routing, and port-based routing.

exported device A device that has been mapped between fabrics (a host or storage port in one edge fabric can be exported to any other fabric including backbone by using LSAN zoning).

extended edge PID This format generates the same PID for a port on switches with 16 ports or less as would native PID format, but it also supports up to 256 ports per domain. It should be used only in cases where you cannot upgrade devices to dynamic PID binding and you must not reboot your servers. Extended edge PID is supported in Fabric OS v2.6.2 and later, v3.1.2 and later, and v4.2.0 and later. *See also* VC Encoded PID, native PID, and core PID.

extent A range of logical blocks within a logical unit (LU). The path name identifies both the LU of which this extent is part and the path used to access this extents. *See also* DMM Appliance.

extent pair An extent pair associates two extents in DMM: a source extent and an appropriate destination extent. This pair then identifies the migration locations to DMM. *See also* DMM Appliance.

F

F_Port Fabric port. Fabric port on a switch to which an N_Port connects. *See also* N_Port, and Fx_Port.

fabric One or more interconnected Fibre Channel switches. The term *fabric* refers to only the interconnected switches and not to devices connected to the fabric. *See also* cascade, SAN, and topology.

fabric application platform A switching device that enables fabric-based storage applications to run within a fabric at wire-speed. The Brocade SilkWorm AP7420 is an example of a fabric application platform.

Fabric Manager Fabric Manager is licensed Brocade software that resides on a host computer and enables fabric-wide GUI management for multiple fabrics in geographically dispersed locations.

Fabric Mode One of two possible modes for an L_Port, in which the L_Port is connected to another port that is not loop capable, using fabric protocol.

fabric name The unique identifier assigned to a fabric and communicated during login and port discovery.

fabric port count The number of ports available to connection SAN devices in a fabric.

fabric services Codes that describe the communication to and from any well-known address.

fabric topology The arrangement of switches that form a fabric.

Fabric Watch An optionally licensed Brocade software. Fabric Watch can be accessed through either the command line or Web Tools, and it provides the ability to set thresholds for monitoring fabric conditions.

failover On a SilkWorm director, the process of activating the standby CP and transferring switch processing to this CP. Typically a failover occurs when a problem is detected in the active CP, and the Standby CP is made active so that traffic is not disrupted. Multiple failovers occur during the **firmwareDownload** process, because when new firmware is activated the CP must be rebooted.

FAN Fabric address notification. Retains the AL_PA and fabric address when a loop reinitializes, if the switch supports FAN.

fan-in The ratio of hosts to storage devices; the view of the SAN from the storage port's perspective.

fan-out The ratio of storage devices to hosts; the view of the SAN from the host port's perspective.

FC-16 A 16-port SilkWorm Director blade supporting 1- and 2-Gbit/sec port speeds. This port blade is compatible with only the SilkWorm 12000 (CP1) or SilkWorm 24000 (CP2) control processor blades.

FC2-16 A 16-port SilkWorm Director blade supporting 1- and 2-Gbit/sec port speeds. This port blade is compatible with only the SilkWorm 24000 (CP2) or SilkWorm 48000 (CP4) control processor blades.

FC4-16 A 16-port SilkWorm Director blade supporting 1-, 2-, and 4-Gbit/sec port speeds. This port blade is compatible with only the SilkWorm 24000 (CP2) or SilkWorm 48000 (CP4) control processor blades and does not support private devices.

FC4-32 A 32-port SilkWorm director port blade supporting 1-, 2-, and 4-Gbit/sec port speeds. This port blade is compatible with only the SilkWorm 48000 (CP4) control processor blades and does not support private devices.

FCIP Fibre Channel over IP.

FCIP Tunneling Service A routing service that enables SANs to span longer distances than could be supported with native Fibre Channel links. FCIP is a TCP/IP-based tunneling protocol that allows the transparent interconnection of geographically distributed SAN islands through an IP-based network. The links appear as virtual E_Ports (VE_Ports) in **switchShow**.

Fibre Channel Routing Services Fibre Channel Routing Services enables two or more fabrics to share resources (such hosts or storage devices) without merging those fabrics. *See also* backbone fabric, translate phantom domain, and phantom device.

FCS switch Relates to the Brocade Secure Fabric OS feature. One or more designated switches that store and manage security parameters and configuration data for all switches in the fabric. They also act as a set of backup switches to the primary FCS switch. *See also* primary FCS switch.

FC-SW-2 The second-generation Fibre Channel Switch Fabric standard defined by ANSI. Specifies tools and algorithms for the interconnection and initialization of Fibre Channel switches to create a multiswitch Fibre Channel fabric.

FDDI Fibre Distributed Data Interface. An ANSI architecture for a metropolitan area network (MAN); a network based on the use of fiber-optic cable to transmit data at 100 Mbit/sec.

FDMI Fabric-Device Management Interface. FDMI is a database service provided by the fabric for Nx_Ports. The primary use is by HBA devices that register information about themselves and their ports.

FFFFF5 Well-known Fibre Channel address for a Class 6 multicast server.

FFFFF6 Well-known Fibre Channel address for a clock synchronization server.

FFFFF7 Well-known Fibre Channel address for a security key distribution server.

FFFFF8 Well-known Fibre Channel address for an alias server.

FFFFF9 Well-known Fibre Channel address for a QoS facilitator.

FFFFFA Well-known Fibre Channel address for a management server.

FFFFFB Well-known Fibre Channel address for a time server.

FFFFFC Well-known Fibre Channel address for a directory server.

FFFFFD Well-known Fibre Channel address for a fabric controller.

FFFFFE Well-known Fibre Channel address for a fabric F_Port.

FFFFFF Well-known Fibre Channel address for a broadcast alias ID.

Fibre Channel The primary protocol used for building SANs to transmit data between servers, switches, and storage devices. Unlike IP and Ethernet, Fibre Channel was designed to support the needs of storage devices of all types. It is a high-speed, serial, bidirectional, topology-independent, multiprotocol, and highly scalable interconnection between computers, peripherals, and networks.

FICON® A protocol used on IBM mainframes. Brocade SilkWorm switch FICON support enables a SilkWorm fabric to transmit FICON format data between FICON-capable servers and storage.

FID Fabric ID. Unique identifier of a fabric in a metaSAN. The backbone fabric is also identified using a unique fabric ID. *See also* Fibre Channel Routing Services.

FIFO First in, first out. Refers to a data buffer that follows the first in, first out rule.

firmware The Brocade Fabric OS provided with SilkWorm hardware.

fixed port usage In Web Tools EZ, fixed port usage means that a set of switch ports is designated to be used as HBA (host) ports and a set of ports is designated to be used as storage ports.

fixed zoning In Web Tools EZ, fixed zoning is a preconfigured default zoning setup that is set at the factory. It enforces the rule of one HBA port zoned with one storage port. Fixed zoning is *hard zoning*; each zone member is identified by the default switch domain (1) and a port number. Fixed zoning is set up based on *fixed port usage*.

FL_Port Fabric loop port. A port that is able to transmit under fabric protocol and also has arbitrated-loop capabilities. Can be used to connect an NL_Port to a switch. *See also* F_Port, and Fx_Port.

flash Programmable nonvolatile RAM (NVRAM) memory that maintains its contents without power.

FLOGI Fabric login. The process by which an N_Port determines whether a fabric is present and, if so, exchanges service parameters with it. *See also* PLOGI.

FR4-18i An 4-Gbit/sec application processor blade with 16 FC ports and 2 GbE ports. This blade supports FCIP and Fibre Channel Routing Services and is available for the SilkWorm 48000. The director must be in **chassisConfig** mode 5 for the blade to be recognized. See also FCIP Tunneling Service, and Fibre Channel Routing Services.

fractional bandwidth The partial use of a link to send data back and forth, with a maximum of 254 Class 4 connections per N_Port.

frame The Fibre Channel structure used to transmit data between ports. Consists of a start-of-frame delimiter, header, optional headers, data payload, cyclic redundancy check (CRC), and end-of-frame delimiter. There are two types of frames: link control frames (transmission acknowledgements and so forth) and data frames.

frame relay A protocol that uses logical channels, as used in X.25. Provides very little error-checking ability. Discards frames that arrive with errors. Allows a certain level of bandwidth between two locations (known as a “committed information rate”: CIR) to be guaranteed by service provider. If CIR is exceeded for short periods (known as “bursts”), the network accommodates the extra data, if spare capacity is available. Frame relay is therefore known as “bandwidth on demand.”

front domain A tier of virtual domains between the translation domains and the edge fabrics. This allows FSPF multipathing to work as desired. Current FC Routing Service uses one front domain per EX_Port, although future implementations might limit this to one per edge fabric. No FC-NAT devices are ever “hung off of” front domains: each IFL connection from a router to an edge fabric creates a front domain.

FRU Field-replaceable unit, such as a fan assembly or power supply assembly. A component that can be replaced onsite, typically without powering off the switch, or disconnecting the switch from the fabric. *See also* hot swappable.

FSPF The IEEE T11 standard routing protocol for Fibre Channel switch. FSPF was written by Brocade.

FSS Fabric OS state synchronization. The FSS service is related to high availability (HA). The primary function of FSS is to deliver state update messages from active components to their peer standby components. FSS determines if fabric elements are synchronized (and thus FSS "compliant").

FTP File Transfer Protocol.

full fabric The Brocade software license that allows multiple E_Ports on a switch, making it possible to create multiple ISL links.

full fabric citizenship A loop device that has an entry in the Simple Name Server.

full duplex A mode of communication that allows the same port to simultaneously transmit and receive frames. *See also* half duplex.

Fx_Port A fabric port that can operate as either an F_Port or FL_Port. *See also* F_Port, FL_Port.

G

G_Port Generic port. A port that can operate as either an E_Port or an F_Port. A port is defined as a G_Port when it is not yet connected or has not yet assumed a specific function in the fabric.

gateway Gateway hardware merges SANs into a single fabric by establishing point-to-point E_Port connectivity between two Fibre Channel switches that are separated by a network with a protocol such as IP or SONET.

GbE Port Two Gigabit Ethernet (GbE) ports are available on the SilkWorm 7500 and FR4-18i blade. These ports support the FCIP and Fibre Channel Routing Services features with link speeds up to 1-Gbit/sec. Each GbE port can support up to 8 FCIP tunnels. Each FCIP tunnel is represented and managed as an Fibre Channel E_Port. Fibre Channel Routing Services functionality can be used over the FCIP link. *See also* FCIP Tunneling Service.

GBIC Gigabit interface converter. A removable serial transceiver module that allows gigabaud physical-level transport for Fibre Channel and gigabit Ethernet. GBICs have been replaced by SFPs in newer Brocade switches. *See also* SFP.

GMT Greenwich Mean Time. An international time zone. Also known as "UTC."

GoldenEye A Brocade 4-Gbit/sec switch ASIC. Used in the SilkWorm 200E.

GUI A graphical user interface, such as Web Tools and Fabric Manager.

H

HA High availability. A set of features in SilkWorm switches that is designed to provide maximum reliability and nondisruptive replacement of key hardware and software modules. HA features include, the HA manager and failover functionality within the Fabric OS software, and hardware features such as redundant hot swappable CPs, fan FRUs, power supplies, and WWN cards.

HA manager A daemon in the Fabric OS that monitors processes within the Fabric OS. If an error is detected, the HA manager will failover to the standby CP and reboot the primary CP.

half duplex A mode of communication that allows a port to either transmit or receive frames at any time except simultaneously (with the exception of link control frames, which can be transmitted at any time). *See also* full duplex.

hard address The AL_PA that an NL_Port attempts to acquire during loop initialization.

hardware enforced zoning Hardware-enforced zoning is specified when using the a homogenous zoning scheme. That is, when all members of a zone configuration are defined using the same method, either <domains, ports> or WWNs, but not both. *See also* software enforced zoning.

Hardware Translative Mode A method for achieving address translation. There are two hardware translative modes available to a QuickLoop enabled switch: Standard Translative Mode and QuickLoop Mode.

HBA Host bus adapter. The interface card within a server or workstation that allows an operating system to communicate on a Fibre Channel network.

header A Fibre Channel frame has a header and a payload. The header contains control and addressing information associated with the frame.

HiPPI High-Performance Parallel Interface. An 800 Mbit/sec interface normally used in supercomputer environments.

hop count The number of ISLs a frame must traverse to get from its source to its destination.

host A computer system that provides end users with services like computation and storage access.

hot swappable A sub-system component (such as a power supply or fan assembly) that can be replaced while the overall system remains powered and functional.

HSSDC High-speed serial data connection. A form factor that allows quick connections for copper interface.

HSSDC-2 A second-generation HSSDC connector.

HTTP Hypertext Transfer Protocol. The standard TCP/IP transfer protocol used on the World Wide Web.

HTTPS Hypertext Transfer Protocol secure link. Switches and directors configured for SSL grant access to management tools through hypertext transfer protocol secure links (which begin with *https://*) instead of standard links (which begin with *http://*). *See also* SSL.

hub A Fibre Channel wiring concentrator that collapses a loop topology into a physical star topology. SAN devices are automatically added to the loop when active and removed when inactive.

hunt group A number of N_Ports registered as a single Alias_ID so that the fabric can route a word to a port that is not busy.

I

I2C Related to internal circuitry on motherboard.

ID_ID Insistent domain ID. A parameter of the **configure** command in the Fabric OS.

idle Continuous transmission of an ordered set over a Fibre Channel link when no data is being transmitted, to keep the link active and maintain bit, byte, and word synchronization.

iFCP Internet Fibre Channel Protocol. Supports Fibre Channel Layer 4 FCP-Over-TCP/IP. It is a gateway-to-gateway protocol in which TCP/IP switching and routing components enhance/replace Fibre Channel fabric.

iFCS IP storage fabric configuration server.

IFL Interfabric link. A connection between a router and an edge fabric. Architecturally, these can be of type EX_Port-to-E_Port or EX_Port-to-EX_Port.

in-band Transmission of management protocol over the Fibre Channel.

initiator A server or workstation on a Fibre Channel network that initiates communications with storage devices. *See also* target.

Insistent Domain ID Mode Sets the domain ID of a switch as insistent, so that it remains the same over reboots, power cycles, failovers, and fabric reconfigurations.

intercabinet A specification for copper cabling that allows up to 33-meter distances between cabinets.

intermix Allows any unused bandwidth in a Class 1 connection.

interop mode The *interoperability* mode enables Brocade switches and other vendor switches to exchange interoperability parameters, allowing their fabrics to merge into one fabric with one principal switch and unique domain IDs. This mode is enabled using the **interopMode** command. Using interop mode significantly reduces the advanced functionality of Brocade switches.

interswitch link *See* ISL.

intracabinet A specification for copper cabling that allows up to a 13-meter (42-foot) distance within a single cabinet.

IOCDS I/O Configuration Data Set.

IOCTL I/O control.

IOD In-order delivery. A parameter that, when set, guarantees that frames are either delivered in order or dropped.

ISL Interswitch link. A Fibre Channel link from an E_Port of one switch to an E_Port of another. *See also* cascade, E_Port.

ISL oversub-scription ratio The ratio of the number of free ports (non-ISL) to the number of ISLs on a switch.

isolated E_Port An E_Port that is online but not operational due to overlapping domain IDs or nonidentical parameters (such as E_D_TOVs). Frequently appears in the command line or logs as segmented. *See also* E_Port.

ISP Internet service provider.

IU Information unit. A set of information as defined by either an upper-level process protocol definition or upper-level protocol mapping.

J

JBOD “Just a bunch of disks.” Indicates a number of disks connected in a single chassis to one or more controllers. *See also* RAID.

jitter A deviation in timing for a bit stream as it flows through a physical medium.

K

K28.5 A special 10-bit character used to indicate the beginning of a transmission word that performs Fibre Channel control and signaling functions. The first seven bits of the character are the comma pattern. *See also* comma.

key A string of data (usually a numeric value) shared between two entities and used to control a cryptographic algorithm. Usually selected from a large pool of possible keys to make unauthorized identification of the key difficult. *See also* key pair.

key pair In public key cryptography, a pair of keys consisting of an entity's public and private key. The public key can be publicized, but the private key must be kept secret. *See also* public key cryptography.

L

L_Port Loop port. A node port (NL_Port) or fabric port (FL_Port) that has arbitrated-loop capabilities. An L_Port can be in one of two modes:

- **Fabric Mode** Connected to a port that is not loop capable and using fabric protocol.
- **Loop Mode** In an arbitrated loop and using loop protocol. An L_Port in loop mode can also be in *Participating Mode* or *Nonparticipating Mode*.

LAN Local area network. A network in which transmissions typically take place over fewer than 5 kilometers (3.4 miles).

latency The time required to transmit a frame. Together, latency and bandwidth define the speed and capacity of a link or system.

LED Light-emitting diode. Used to indicate the status of elements on a switch.

LIFA Loop-initialization fabric-assigned frame. Contains a bitmap of all fabric-assigned AL_PAs and is the first frame transmitted in the loop initialization process after a temporary loop master has been selected.

LIHA Loop-initialization hard-assigned frame. A hard-assigned AL_PA that is indicated by a bit set and is the third frame transmitted in the loop initialization process after a temporary loop master has been selected.

LILP Loop-initialization loop-position frame. The final frame transmitted in a loop initialization process. A returned LIRP contains an accumulation of all of the AL_PA position maps. This allows loop members to determine their relative loop position. This is an optional frame and is not transmitted unless the LIRP is also transmitted.

link control facility A termination, handling physical and logical control of the Fibre Channel link for each mode.

Link Services A protocol for link-related actions.

LIP Loop initialization primitive. The signal used to begin initialization in a loop. Indicates either loop failure or SAN device resetting.

LIPA Loop-initialization previously assigned. The device marks a bit in the bitmap if it did not log in with the fabric in a previous loop initialization.

LIRP Loop-initialization report position frame. The first frame transmitted in the loop initialization process after all L_Ports have selected an AL_PA. The LIRP gets transmitted around the loop so all L_Ports can report their relative physical position. This is an optional frame.

LISA Loop-initialization soft-assigned frame. The fourth frame transmitted in the loop initialization process after a temporary loop master has been selected. L_Ports that have not selected an AL_PA in a LIFA, LIPA, or LIHA frame select their AL_PA here.

LISM Loop-initialization select master frame. The first frame transmitted in the initialization process when L_Ports select an AL_PA. LISM is used to select a temporary loop master or the L_Port that will subsequently start transmission of the LIFA, LIPA, LIHA, LISA, LIRP, or LILP frames.

LM_TOV Loop master timeout value. The minimum time that the loop master waits for a loop initialization sequence to return.

Locality The degree that I/O is confined to a particular switch or segment of a fabric. If two devices that need to communicate with each other are located on the same switch or fabric segment, then these two devices are said to have high locality. If these same devices are located on different switches or segments of a fabric and these two devices need to communicate with each other, then these devices are said to have low locality.

Loom Brocade 1-Gbit/sec switch ASIC. Used in the SilkWorm 2000 series of switches.

loop circuit A temporary bidirectional communication path established between L_Ports.

loop failure Loss of signal within a loop for any period of time, or loss of synchronization for longer than the timeout value.

Loop_ID A hexadecimal value representing one of the 127 possible AL_PA values in an arbitrated loop.

loop initialization The logical procedure used by an L_Port to discover its environment. Can be used to assign AL_PA addresses, detect loop failure, or reset a SAN device.

Loop Mode One of two possible modes for an L_Port, in which the L_Port is in an arbitrated loop, using loop protocol. An L_Port in Loop Mode can also be in Participating Mode or Nonparticipating Mode.

looplet A set of devices connected in a loop to a port that is a member of another loop.

LPB Loop port bypass. A primitive sequence transmitted by an L_Port to bypass one or all L_Ports to which it is directed. It is used only in arbitrated loops.

LPE Loop port enable. A primitive sequence transmitted by an L_Port to enable one or all L_Ports that have been bypassed with the LPB. It is used only in arbitrated loops.

LPSM Loop Port State Machine. Logic that monitors and performs the tasks required for initialization and access to the loop. It is maintained by an L_Port to track behavior through different phases of loop operations. Alternatively, the logical entity that performs arbitrated-loop protocols and defines the behavior of L_Ports when they require access to an arbitrated loop.

LR Link reset. A primitive sequence used during link initialization between two N_Ports in point-to-point topology or an N_Port and an F_Port in fabric topology. The expected response is an LRR.

LRR Link reset response. A primitive sequence during link initialization between two N_Ports in point-to-point topology or an N_Port and an F_Port in fabric topology. It is sent in response to an LR and expects a response of Idle.

LSAN Logical storage area network. An LSAN enables device and storage connectivity that spans two or more fabrics. The path between devices in an LSAN can be local to a fabric or cross one or more FC routers and one or more backbone fabrics.

LSAN device entry The total number of port WWN entries for all devices defined in all active LSAN zones within a routed fabric. For example, if Fabric 1 has lsan_zone 1 with devices A and B and Fabric 2 has lsan_zone 2with devices A and B, four LSAN entries are consumed.

LSAN zone Any zone defined in an edge fabric in which the zone name is prefixed with the tag *LSAN_*. The LSAN_ tag is not case sensitive. LSAN zones are a way to specify interfabric connectivity and the creation of proxy devices. For example, if Fabric 1 has lsan_zone 1 with devices A and B and Fabric 2 has lsan_zone 2 with devices A and B, two LSAN zone entries are consumed.

LSAN zone entry The number of port WWN entries defined in an edge-fabric or backbone LSAN zone.

LUN Logical unit number.

LU path The DMM LU path identifies a path to a logical unit (LU). It is the port WWN (pWWN) of the array and the logical unit number from the standpoint of the virtual initiators. *See also* DMM Appliance.

LWL Long wavelength. A type of fiber optic cabling that is based on 1310-mm lasers and supports link speeds of 1.0625, 2.125, and/or 4.25 Gbit/sec. Can also refer to the type of GBIC or SFP. *See also* SWL.

M

MALLOC Memory allocation. Usually relates to buffer credits.

MAN Metropolitan area network.

Mbit/sec Megabits per second.

MB/sec Megabytes per second.

metaSAN The collection of all SAN devices, switches, edge fabrics, LSANs, and multiprotocol routers that make up a physically connected but logically partitioned storage area network.

metric A relative value assigned to a route to aid in calculating the shortest path (defaults to 1000 @ 1-Gbit/sec, 500 @ 2- or 4-Gbit/sec).

MIA Media interface adapter. A device that converts optical connections to copper ones, and vice-versa.

MIB Management Information Base. A tree structure of configuration data on a switch. MIBs can be used to manage the configuration of a switch from an SNMP management station. Every Brocade switch carries an SNMP agent (for communicating with an SNMP management station) and management information base (MIB). *See also* SNMP.

migration set A collection of epairs that comprise a migration. DMM uses migration sets (msets) to configure migrations and scheduling policies. *See also* DMM Appliance.

MMF Multimode fiber. *See* SWL.

MOF Managed Object Format file.

MRK Mark primitive signal. Used only in arbitrated loop, MRK is transmitted by an L_Port for synchronization and is vendor specific.

MS Management Server. The Management Server allows a storage area network (SAN) management application to retrieve information and administer the fabric and interconnected elements, such as switches, servers, and storage devices. The MS is located at the Fibre Channel well-known address FFFFFAh.

MSD Management Server daemon. Monitors the MS. Includes the Fabric Configuration Service and the Unzoned Name Server.

mset Migration set. *See* migration set, and DMM Appliance.

MSRS Multiprotocol SAN Routing Services. An optionally licensed software bundle available on certain Brocade platforms, such as the SilkWorm Fabric AP7420, that includes the Fibre Channel Routing Service, the iSCSI Gateway Service, and the FCIP Tunneling Service.

MTBF Mean time between failures. An expression of time, indicating the longevity of a device.

multicast The transmission of data from a single source to multiple specified N_Ports (as opposed to all the ports on the network). *See also* broadcast, unicast.

multimode A fiber optic cabling specification in which multiple light waves (or modes) are transmitted over relatively short distances due to modal dispersion. Single mode specifies a single light wave and can transmit over much longer distances. Specific distance limitations at a certain speed are determined by the optical loss budget for the transmit and receive optics.

N

N_Port Node port. A Fibre Channel host or storage port in a fabric or point to point connection. *See also* NL_Port, Nx_Port.

Name Server Simple Name Server (SNS). A switch service that stores names, addresses, and attributes for up to 15 minutes and provides them as required to other devices in the fabric. SNS is defined by Fibre Channel standards and exists at a well-known address. Also referred to as "directory service."

NAS Network-attached storage; disk storage connected to an IP network that provides file level access for hosts. The protocols used are typically CIFS for MS Windows environments and NFS for Unix and Linux environments.

native PID Introduced with the SilkWorm 2000 series, this PID format supports up to 16 ports per switch. *See also* VC Encoded PID, core PID, and extended edge PID.

NDMP Network Data Management Protocol. Used for tape backup without using server resources.

NIC Network interconnect card.

NL_Port Node loop port. A node port that has arbitrated-loop capabilities. Used to connect an equipment port to the fabric in a loop configuration through an FL_Port. *See also* N_Port, Nx_Port.

node A Fibre Channel device that contains an N_Port or NL_Port.

node count The number of SAN devices attached to a fabric.

node name The unique identifier for a SAN device, communicated during login and port discovery.

Nonparticipating Mode A mode in which an L_Port in a loop is inactive and cannot arbitrate or send frames but can retransmit received transmissions. This mode is entered if there are more than 127 devices in a loop and an AL_PA cannot be acquired. *See also* L_Port, Participating Mode.

NOS Not operational. The NOS primitive sequence is transmitted to indicate that the FC_Port transmitting the NOS has detected a link failure or is offline, waiting for the offline sequence (OLS) to be received.

NR_Port A normal E_Port used to connect an FC Router to a backbone fabric.

NS Name Server. The service provided by a fabric switch that stores names, addresses, and attributes related to Fibre Channel objects. Can cache information for up to 15 minutes. Also known as "Simple Name Server" or as a "directory service." *See also* Simple Name Server (SNS).

NSCAM Name Server Cache Manager. Updates the Name Server (NS) databases across switches as a background task.

Nx_Port A node port that can operate as either an N_Port or NL_Port.

O

OFC Open fiber control. A method used to enable and disable laser signaling for higher-intensity laser transceivers.

OLS Primitive sequence offline.

OLTP Online transaction processing.

ON Offline notification. Refers to an ELS field that appears in **portLogDump** command output.

OPN Open primitive signal. Applies only to arbitrated loop; sent by an L_Port that has won the arbitration process to open communication with one or more ports on the loop.

ordered set A transmission word that uses 8b/10b mapping and begins with the K28.5 character. Ordered sets occur outside of frames and include the following items:

- **Frame delimiters.** Mark frame boundaries and describe frame contents.
- **Primitive signals.** Indicate events.
- **Primitive sequences.** Indicate or initiate port states.

Ordered sets are used to differentiate Fibre Channel control information from data frames and to manage frame transport.

originator The Nx_Port that originated an exchange.

out-of-band Transmission of management protocol outside of the Fibre Channel network, usually over Ethernet.

out-of-box switch A switch coming from the factory without any customized settings. Web Tools EZ determines that a switch is an out-of-box switch if the passwords of all of the default accounts (root, factory, admin, and user) are set to the default passwords.

oversub-scription A situation in which more SAN devices could potentially contend for a resource than the resource could simultaneously support (typically an ISL). Oversubscription could be a desirable attribute in fabric topology, as long as it does not produce unacceptable levels of congestion.

OX_ID Originator ID or exchange ID. Refers to the exchange ID assigned by the originator port.

P

packet A set of information transmitted across a network. *See also* frame.

PAL Programmable Array Logic. A relatively small FPD.

parallel The simultaneous transmission of data bits over multiple lines.

Participating Mode A mode in which an L_Port in a loop has a valid AL_PA and can arbitrate, send frames, and retransmit received transmissions. *See also* L_Port, Nonparticipating Mode.

passive copper A low-cost copper Fibre Channel connection, allowing distances up to 13 meters between devices.

path selection The selection of a transmission path through the fabric. Brocade switches use the FSPF protocol. *See also* FSPF.

payload A Fibre Channel frame has a header and a payload. The payload contains the information being transported by the frame; it is determined by the higher-level service or FC_4 upper-level protocol. There are many different payload formats, based on protocol.

PBC Port bypass circuit. A circuit in hubs or a disk enclosure to open or close a loop to add or remove SAN devices.

PCBA Printed circuit board assembly.

PCM Pulse-code modulation. A standard method of encoding analog audio signals in digital form.

Performance Monitoring A Brocade SilkWorm switch feature that monitors port traffic and includes frame counters, SCSI read monitors, SCSI write monitors, and other types of monitors.

persistent For Brocade products, this means that a configuration will remain in place over a reboot or power cycle of the switch or director.

phantom address A PID value that is assigned to a device that is not physically in a loop.

phantom device A device that is not physically in an arbitrated-loop but is logically included through the use of a phantom address.

phantom domain ID Domain ID used for importing devices into edge or back-bone fabrics.

PID Port identifier. *See also* VC Encoded PID, native PID, core PID, and extended edge PID.

PKI Public key infrastructure. An infrastructure that is based on public key cryptography and CA (certificate authority) and that uses digital certificates. *See also* digital certificate, public key cryptography.

PKI certification utility Public key infrastructure certification utility. A utility that makes it possible to collect certificate requests from switches and to load certificates to switches. *See also* digital certificate, PKI.

PLDA Private loop direct-attached. A technical report specifying a logical loop.

PLOGI Port login. The port-to-port login process by which initiators establish sessions with targets. *See also* FLOGI.

point-to-point A Fibre Channel topology that employs direct links between each pair of communicating entities. *See also* topology.

port In a Brocade SilkWorm switch environment, an SFP or GBIC receptacle on a switch to which an optic cable for another device is attached.

port address In Fibre Channel technology, the port address is defined in hexadecimal. In the Brocade Fabric OS, a port address can be defined by a domain and port number combination or by area number. In an ESCON Director, an address used to specify port connectivity parameters and to assign link addresses for attached channels and control units.

port-based routing A routing policy in which the choice of routing path is based on the incoming port and the destination domain. To optimize port-based routing, the Dynamic Load Sharing feature (DLS) can be enabled to balance the load across the available output ports within a domain. *See also* device-based routing, and exchange-based routing.

port cage The metal casing extending out of the optical port on the switch, into which the SFP can be inserted.

port card A hardware component that provides a platform for field-replaceable, hot swappable ports.

port group A group of adjacent ports that share a common pool of frame buffers for long distance connections.

port-level zoning Defines a zone member by “domain,port”, which is the physical port to which the member is connected. *See also* zone member, WWN-level zoning.

port name A user-defined alphanumeric name for a port.

port swapping The port swapping feature enables you to swap the area numbers for a pair of ports on a switch or director. If a device that uses port binding is connected to a port that fails, you can use port swapping to make another physical port use the same PID as the failed port. The device can then be plugged into the new port without the need to reboot the device.

ports on demand Ports on demand (POD) license is a feature available on certain switches such as the SilkWorm 200E. These switches are shipped with only half the physical ports on the switch activated. The POD license is used to activate the remaining ports on the switch. Usually more than on POD license is required to enable all the ports on the switch.

port_name The unique identifier assigned to a Fibre Channel port. Communicated during login and port discovery.

POST Power-on self-test. A series of tests run by a switch after it is turned on.

PPID Unique static identifier for each blade in a bladed server. It resides on a printed label and on an electronic tag on the card.

PPP Point-to-Point Protocol.

primary FCS switch Relates to the Brocade Secure Fabric OS feature. The primary fabric configuration server switch actively manages security and configurations for all switches in the fabric. *See also* backbone fabric, FCS switch.

primitive sequence An ordered set that is transmitted repeatedly and continuously. Primitive sequences are transmitted to indicate specific conditions within or conditions encountered by the receiver logic of an FC_Port. *See* OLS, NOS.

primitive signals An ordered set that indicates actions or events and requires just one occurrence to trigger a response. IDLE and R_RDY are used in all three topologies: ARB, OPN, and CLS. MRK is used in arbitrated loop.

principal switch The switch within a fabric that is responsible for assigning unique domain IDs to other switches. The principal switch is determined either by the lowest switch WWN, the **fabricPrincipal** command, or the order in which the switches are cabled and powered on.

private device A device that supports arbitrated-loop protocol and can interpret 8-bit addresses but cannot log in to the fabric.

private key The secret half of a key pair. *See also* key, key pair.

private loop An arbitrated loop that does not include a participating FL_Port.

private loop device A device that supports a loop and can understand 8-bit addresses but does not log in to the fabric.

private NL_Port An NL_Port that communicates only with other private NL_Ports in the same loop and does not log in to the fabric.

protected module A Web Tools module to which you must log in if *upfront login* is disabled. Protected modules allow you to modify the switch information. The Switch Admin and Zoning modules are protected modules.

protocol A defined method and set of standards for communication. Determines the type of error-checking, the data-compression method, how sending devices indicate an end of message, and how receiving devices indicate receipt of a message.

proxy device A virtual device present in a local fabric that represents a physical device connected to a different edge fabric. From the perspective of a local device that is physically connected to a fabric, a proxy device is said to be *imported*; from the perspective of the remote fabric, the proxy device is said to be *exported*.

pstate Port State Machine.

PSU Power supply unit.

public device A device that supports arbitrated-loop protocol, can interpret 8-bit addresses, and can log in to the fabric.

public key The public half of a key pair. *See also* key, key pair.

public key cryptography A type of cryptography that uses a key pair, with the two keys in the pair called at different points in the algorithm. The sender uses the recipient's public key to encrypt the message, and the recipient uses the recipient's private key to decrypt it. *See also* key pair, PKI.

public loop An arbitrated loop that includes a participating FL_Port and can contain both public and private NL_Ports.

public NL_Port An NL_Port that logs in to the fabric, can function within either a public or a private loop, and can communicate with either private or public NL_Ports.

Q

QLA A type of Fibre Channel controller.

QLFA QuickLoop Fabric Assist. Arbitrated-loop technology.

QoS Quality of service.

queue A mechanism for each AL_PA address that allows for collecting frames prior to sending them to the loop.

QuickLoop A Brocade software product that allows multiple ports on a switch to create a logical loop. Devices connected via QuickLoop appear to each other as if they are on the same arbitrated loop.

QuickLoop Mode Allows initiator devices to communicate with private or public devices that are not in the same loop.

R

R_A_TOV Resource allocation timeout value. The maximum time a frame can be delayed in the fabric and still be delivered. *See also* E_D_TOV, RR_TOV.

R_CTL Route control. The first 8 bits of the header, which defines the type of frame and its contents.

R_RDY Receiver ready. A primitive signal indicating that the port is ready to receive a frame.

R_T_TOV Receiver transmitter timeout value, used by receiver logic to detect loss of synchronization between transmitters and receivers.

radius The greatest "distance" between any edge switch and the center of a fabric. A low-radius network is better than a high-radius network.

RAID Redundant array of independent disks. A collection of disk drives that appear as a single volume to the server and are fault tolerant through mirroring or parity checking. *See also* JBOD.

RAIT Redundant array of independent tapes.

RCS Reliable Commit Service. Refers to Brocade-specific ILS command code.

RCS_SFC RCS Stage Fabric Config. Refers to Brocade-specific ILS command code.

receiver A device that performs detection and signal processing.

redundancy Having multiple occurrences of a component to maintain high availability (HA).

Remote Switch A Brocade optionally licensed product for long-distance fabrics, requiring a Fibre Channel-to-ATM or SONET gateway.

repeater A circuit that uses a recovered clock to regenerate and transmit an outbound signal.

request rate The rate at which requests arrive at a servicing entity.

resilience A fabric's ability to adapt to or tolerate a failure of a component within the fabric.

resilient core/ edge topology Two or more switches acting as a core to interconnect multiple edge switches. SAN devices attach to the edge switches.

responder The N_Port with which an exchange originator attempts to communicate.

retimer A circuit that uses an independent clock to generate outbound signals.

return loss The ratio (expressed in dB) of incident power to reflected power, when a component or assembly is introduced into a link or system. Can refer to optical power or to electrical power in a specified frequency range.

RLS Read Link Status.

route As it applies to a fabric, the communication path between two switches. Might also apply to the specific path taken by an individual frame, from source to destination. *See also* FSPF.

routed fabric Two or more edge fabrics interconnected by one or more backbone fabrics.

router *See* Fibre Channel Routing Services.

routing The assignment of frames to specific switch ports, according to frame destination.

RR_TOV Resource recovery timeout value. The minimum time a target device in a loop waits after an LIP before logging out an SCSI initiator. *See also* E_D_TOV, R_A_TOV.

RSCN Registered state change notification. A switch function that allows notification of fabric changes to be sent from the switch to specified SAN devices. The fabric controller issues RSCN requests to N_Ports and NL_Ports, but only if they have registered to be notified of state changes in other N_Ports and NL_Ports. This registration is performed using the State Change Registration (SCR) Extended Link Service. An N_Port or NL_Port can issue an RSCN to the fabric controller without having completed SCR with the fabric controller.

RTWR Reliable transport with response.

running disparity A binary parameter indicating the cumulative disparity (positive or negative) of all previously issued transmission characters.

RW Read/write. Refers to access rights.

RX Receive. *See also* TX.

RX_ID Responder exchange identifier. A 2-byte field in the frame header that can be used by the responder of the exchange to identify frames as being part of a particular exchange.

S

S_ID Source ID. Refers to the native port address (24 bit address).

SAN A Storage Area Network (SAN) can consist of one or more related fabrics and the connected SAN devices. Fibre Channel is the most common protocol used in SANs because it was designed specifically for block level networking to optimize performance and availability. *See also* fabric.

SAN architecture The overall design of a storage network solution, which includes one or more related fabrics.

SAN device Usually either a host or storage device that attaches to a fabric. A SAN device is sometimes referred to as an N_port, NL_port, Nx_port, or node. For point-to-point devices (also known as N_ports) the relationship is one switch port (also known as an F_port) to one N_port. For loop devices (NL_ports) the relationship is one switch loop port (also known as an FL_port) to one or more NL_ports.

SAS Brocade Storage Application Services.

scalability The ability for a SAN to easily increase the port and switch counts.

SCC SC connector. An SC connector is a fiber-optic cable connector that uses a push-pull latching mechanism similar to common audio and video cables. For bidirectional transmissions, two fiber cables and two SC connectors (dual SC) are generally used.

SCN State change notification. Used for internal state change notifications, not external changes. This is the switch logging that the port is online or is an Fx_Port, not what is sent from the switch to the Nx_Ports.

SCR State change registration. Extended Link Service (ELS) requests the fabric controller to add the N_Port or NL_Port to the list of N_Ports and NL_Ports registered to receive the Registered State Change Notification (RSCN) Extended Link Service.

SCSI Small Computer Systems Interface. A parallel bus architecture and a protocol for transmitting large data blocks to a distance of 15 to 25 meters.

SDRAM The main memory for a switch.

sectelnet A protocol similar to telnet but with encrypted passwords for increased security.

Secure Fabric OS An optionally licensed Brocade feature that provides centralized security tools for a fabric.

security policy Rules that determine how security is implemented in a fabric. Security policies can be customized through Brocade Secure Fabric OS or Brocade Fabric Manager.

sequence A group of related frames transmitted in the same direction between two N_Ports.

sequence initiator The N_Port that begins a new sequence and transmits frames to another N_Port.

sequence recipient Serializing/deserializing circuitry. A circuit that converts a serial bit stream into parallel characters, and vice-versa.

serial The transmission of data bits in sequential order over a single line.

server A computer that processes end-user applications or requests.

SES SCSI Enclosure Services. A subset of the SCSI protocol used to monitor temperature, power, and fan status for enclosed devices.

session The connection between the Web Tools client and its managed switch.

SFP Small-form-factor pluggable. A transceiver used on 2-Gbit/sec and 4-Gbit/sec directors and switches that replaces the GBIC.

SilkWorm The brand name for the Brocade family of switches.

Simple Name Server (SNS) A switch service that stores names, addresses, and attributes for up to 15 minutes and provides them as required to other devices in the fabric. SNS is defined by Fibre Channel standards and exists at a well-known address. Also referred to as “directory service” or “name server.”

Single Mode The fiber-optic cabling standard for devices up to 10 km apart.

S-Link Service Facilities used between an N_Port and the fabric, or between two N_Ports, for login, sequence/exchange management, and maintaining connections.

SLAP Switch Link Authentication Protocol.

SLP Service Location Protocol.

SMDS Switched Multimegabit Data Service. A good protocol for interconnecting LANs; however, SMDS has less error-checking capability than Frame Relay.

SMF Single-mode fiber. *See* LWL.

SMI Storage Management Initiative. A broad-based initiative sponsored by the Storage Networking Industry Association (SNIA) to standardize all aspects of storage management for multivendor storage networking products.

SNMP Simple Network Management Protocol. SNMP is a standard method for monitoring and managing network devices. Using SNMP components, you can program tools to view, browse, and manipulate Brocade switch variables and set up enterprise-level management processes. Every Brocade switch carries an SNMP agent and management information base (MIB). *See also* MIB.

SOF Start of frame. A group of ordered sets that marks the beginning of a frame and indicates the class of service the frame will use.

software enforced zoning This method of zoning is using when members are defined using both WWNs and *domain, port*. Software-enforced zoning prevents hosts from discovering unauthorized target devices, while hardware-enforced zoning prevents a host from accessing a device it is not authorized to access. *See also* hardware enforced zoning.

SoIP SCSI-over-IP.

SONET Synchronous optical network. A standard for optical networks that provides building blocks and flexible payload mappings.

special character A 10-bit character that does not have a corresponding 8-bit value but is still considered valid. The special character is used to indicate that a particular transmission word is an ordered set. This is the only type of character to have five 1s or 0s in a row.

SSH Secure shell. Used starting in Brocade Fabric OS v4.1 to support encrypted telnet sessions to the switch. SSH encrypts all messages, including the client sending the password at login.

SSL Secure sockets layer.

Standard Translative Mode Allows public devices to communicate with private devices that are directly connected to the fabric.

static route A static route is a route that is assigned to a specific path (using the **uRouteConfig** command), and will not change when a topology change occurs, unless the path used by the route becomes unavailable. A static route can be assigned only when the active routing policy is port-based. When device-based or exchange-based routing is active, you cannot assign static routes.

stealth mode A method used in some switches to simulate Brocade switches using QuickLoop.

Stitch The name of the first-generation Brocade Fabric ASIC. This is the ASIC that is used in the SilkWorm 1000 series of switches.

storage A device used to store data, such as a disk or tape.

store-and-forward A switching technique that requires buffering an entire frame before making a routing decision.

striping A RAID technique for writing a file to multiple disks on a block-by-block basis, with or without parity.

switch A Fabric Channel device for connecting storage and servers.

switch name The user assigned name of a switch.

switch port A port on a switch. Switch ports can be E_Ports, F_Ports, or FL_Ports.

switch-to-switch authentication The process of authenticating both switches in a switch-to-switch connection using digital certificates. *See also* authentication, and digital certificate.

SWL Short wavelength. A type of fiber optic cabling that is based on 850 mm lasers and supports 1.0625, 2.125, and 4.25 Gbit/sec link speeds. Can also refer to the type of GBIC or SFP. *See also* LWL.

syslogd Syslog daemon. This UNIX style daemon can be used to forward error messages off the switch to a log on a management workstation.

T

target A storage device on a Fibre Channel network. *See also* initiator.

TC Track changes.

TCP/IP Transmission Control Protocol Internet Protocol.

telnet A virtual terminal emulation used with TCP/IP. “Telnet” is sometimes used as a synonym for the Brocade Fabric OS CLI.

tenancy The time from when a port wins arbitration in a loop until the same port returns to the monitoring state. Also referred to as “loop tenancy.”

throughput The rate of data flow achieved within a cable, link, or system. Usually measured in bps (bits per second or b/sec). *See also* BB fabric.

tiering The process of grouping particular SAN devices by function and then attaching these devices to particular switches or groups of switches based on that function.

Time Server A Fibre Channel service that enables centralized management of switch time settings.

topology As it applies to Fibre Channel technology, the configuration of the Fibre Channel network and the resulting communication paths allowed. There are three possible topologies:

Point to point. A direct link between two communication ports.

Switched fabric. Multiple N_Ports linked to a switch by F_Ports.

Arbitrated loop. Multiple NL_Ports connected in a loop.

track changes A Brocade Fabric OS feature that can be enabled to report logins, logouts, and configuration uploads. The output from the track-changes feature is output to the system error log for the switch.

transceiver A device that converts one form of signaling to another for transmission and reception; in fiber optics, optical to electrical.

translate phantom domain A router virtual domain that represents an entire fabric. Device connectivity can be achieved from one fabric to another, over the backbone fabric through this virtual domain, without merging the two fabrics. Sometimes referred to as “phantom domain,” or “xlate domain.” If an FR4-18i AP blade is attached using an EX_Port to an edge fabric, it will create translate phantom domains in that fabric corresponding to the remote edge fabrics with active LSANs defined. *See also* Fibre Channel Routing Services, and phantom device.

Translative Mode A mode in which private devices can communicate with public devices across the fabric.

trap The message sent by an SNMP agent on a switch to inform the SNMP management station of an error. *See also* SNMP.

trunking A feature that enables distribution of traffic over the combined bandwidth of up to eight ISLs between adjacent switches, while preserving in-order delivery.

trunk group A set of ports that share traffic to a destination domain. Bloom based switches supported trunk groups of up to four ISLs. Condor and GoldenEye based switches support trunk groups of up to eight ISLs.

trunk ports The ports in a set of trunked ISLs.

TS Time Server.

tunneling A technique for enabling two networks to communicate when the source and destination hosts both use the same protocol but are connected through a “tunnel” over a network using a different protocol. For example, using FCIP two Fibre Channel fabrics can be connected through a “tunnel” over an IP network. *See also* FCIP.

TX Transmit. *See also* RX.

U

U_Port Universal port. A switch port that can operate as a G_Port, E_Port, F_Port, or FL_Port. A port is defined as a U_Port when it is not connected or has not yet assumed a specific function in the fabric. Selection of the actual port type is automatic.

UDP User Datagram Protocol. A protocol that runs on top of IP and provides port multiplexing for upper-level protocols.

ULP Upper-level protocol. The protocol that runs on top of Fibre Channel. Typical upper-level protocols are SCSI, IP, HIPPI, and IPI.

ULP_TOV Upper-level timeout value. The minimum time that an SCSI ULP process waits for SCSI status before initiating ULP recovery.

unicast The transmission of data from a single source to a single destination. *See also* broadcast, and multicast.

upfront login A login configuration setting for Web Tools. If upfront login is enabled, users log in only once, when they launch Switch Explorer. If upfront login is disabled (default), users can launch Switch Explorer without logging in, but they must log in every time they launch a switch administration module.

UTC Universal Time Conversion. Also known as "Coordinated Universal Time," which is an international standard of time. UTC is 8 hours behind Pacific Standard Time and 5 hours behind Eastern Standard Time. *See also* GMT.

V

VC Encoded PID PID format defined by the SilkWorm 1000 series. Connections to these switches are not supported in Fabric OS v4.0.0 and later. *See also* native PID, core PID, and extended edge PID.

VE_Port Virtual E_Ports function somewhat like E_Ports, but terminate at the switch and do not propagate fabric services or routing topology information from one edge fabric to another. The link between an E_Port and an EX_Port or VE_Port is called an interfabric link (IFL). After you configure the VE_Ports on either two SilkWorm 7500s or two FR4-18i blades, an FCIP connection is established between them. See *also* FCIP Tunneling Service, and GbE Port.

VEX_Port A type of VE_Port that connects an FC router to an edge fabric. From the point of view of a switch in an edge fabric, an VEX_Port appears as a normal VE_Port. It follows the same Fibre Channel protocol as other VE_Ports. However, the router terminates VEX_Ports rather than allowing different fabrics to merge as would happen on a switch with regular VE_Ports.

W

WAN Wide area network.

WAN_TOV Wide area network timeout value.

well-known address As it pertains to Fibre Channel technology, a logical address defined by Fibre Channel standards as assigned to a specific function and stored on the switch.

workstation A computer used to access and manage the fabric. Also referred to as a "management station" or "host."

WTV Write timeout value. Refers to an ELS field that appears in **portLogDump** command output.

WWN World Wide Name. An identifier that is unique worldwide. Each entity in a fabric has a separate WWN.

WWN-level zoning Defines a zone member using WWW port or WWN SAN device. Defining a zone member as WWN allows the member (device) to be attached without regard to its physical location.

X

xlate domain *See* translate phantom domain.

Z

zone A logical group of member devices. Devices within the same zone have access to others in the zone but are not visible to any device outside the zone. Zones are enabled by making them part of a configuration, and then enabling the configuration.

zone configuration In Brocade Zoning, a zoning object that contains a set of zones. The configuration is the highest-level zoning element and is used to enable or disable a set of zones on the fabric.

zone member Defines a device. A zone member can belong to more than one zone at a time.A zone member can be defined by either port-level zoning (domain,port: the physical port to which it is connected) or WWN-level zoning (using WWW port or WWN SAN device).

zone object A device defined in the zone database. This device can be a member within an alias, zone, or configuration.