GLOSSARY

8b/10b encoding An algorithm that converts 8-bit data into 10-bit transmission characters to avoid long sequences of zeros and ones.

Access control Services to regulate user access to resources.

Access Control List (ACL) A list of permissions that specifies who can access a resource and with what privileges.

Access node Provides connectivity to application servers through the network in CAS.

Accessibility Capability to access required information at the right place by the authorized user.

Accountability services A service that enables administrators to track activities performed on a system and link them back to individuals in such a way that there is little possibility for individuals to deny responsibility for their activities.

Active archive Category of data that is not likely to change or cannot be changed—often referred to as "fixed content" data.

Active attack Unauthorized alteration of information that may pose a threat to data integrity and availability.

Active changeable Category of data that is subject to change and can be changed is referred to as "changeable" data.

Active Directory (AD) Microsoft implementation used to provide central authentication and authorization services.

Actuator arm assembly An assembly to which all R/W heads are attached.

Adaptive copy mode A type of asynchronous replication that does not involve write ordering and data consistency while transferring the data.

Advanced Encryption Standard (AES) A block cipher (cryptographic algorithm) designated by the National Institute of Standards and Technology.

Agent A software program that manages specific objects (such as storage arrays, Fibre Channel switches, and hosts); monitors these objects for alert conditions; gathers information about object performance and configuration; and performs active commands.

Alert Notification of an event that may or may not need attention/action, depending on the type of alert.

Application Programming Interface (API) A set of function calls that enables communication between applications or between an application and an operating system.

Arbitrated Loop A shared Fibre Channel loop whereby each device contends with other devices to perform I/O operations; it is analogous to a token ring.

Arbitration A technique to determine which node gets control of the loop in FC-AL, when one or more nodes attempt to transmit data.

Archive A repository where fixed content is placed for long-term retention.

Array/disk array/storage array A group of hard disk drives that work together as a unit.

Asynchronous replication A write complete is acknowledged immediately to the source host. These writes are queued in the log, transmitted in the same order, and updated to the source. In SRDF it is termed *asynchronous mode*.

Asynchronous Transfer Mode (ATM) A switch-based connection-oriented technology that uses fixed-size cells (53 bytes, with a 48-byte payload and a 5-byte header) for data communication.

Attack surface Various ways in which an attacker can launch an attack.

Attack vector A series of steps necessary to complete an attack.

Authentication A process of verifying the digital identity of the sender in a communication.

Automatic path failover A seamless failover in the event of a path failure whereby I/O failover occurs on an available alternate path without disrupting application operations.

Autoprobe A PowerPath function that periodically tests inactive paths to identify failed paths before sending the I/O application.

Autorestore A PowerPath function that runs every five minutes and tests every failed or closed path to determine whether it has been repaired.

Availability An extent to which a component is available and will function according to business expectations during its specified time of operations.

Availability services Services that ensure reliable and timely access to data for authorized users.

Average queue size An average number of requests in a queue.

Average rotational latency One-half of the time taken for a full rotation of the disk drive platter.

Backup A copy of production data.

Backup catalog A database that holds information about backup processes and metadata.

Backup client A software that retrieves data from a production host and sends it to a storage node for backup.

Backup server A server that manages backup operation and maintains the backup catalog.

Backup to disk Use of disks to store backup data.

Backup window A period of time for which a source is available to perform a backup procedure.

Bandwidth (network) Maximum amount of data that can be transferred over a network in one second; expressed in Mbits/second (Mb/s).

Bare-metal recovery (BMR) A backup in which all metadata, system information, and application configuration is appropriately backed up for a full system recovery.

Battery Backup Unit (BBU) A battery-operated power supply used as an auxiliary source in the event of power failure.

BB_Credit Defines maximum number of frames that can be present over the link at any given point in time.

BC Planning (BCP) A disciplined approach enabling an organization's business functions to operate during and after a disruption.

Binary Large Object (BLOB) A bit sequence of user data representing the actual content of a file. It is independent of the name and physical location of the file.

Block A unit of contiguous fixed-size space on a disk drive.

Block-level access Basic mechanism for data access on the disk drive.

Block-level virtualization Provides an abstraction layer in the SAN between the hosts and the storage arrays.

Block size An application's basic unit of data storage and retrieval.

Bridged topology A topology that provides connectivity between an FC and IP network.

Buffer A temporary storage area, usually in RAM.

Bunker site An intermediate site between production and remote that is used in cascaded/multihop three-site replication to mitigate the risks associated with two-site replication.

Bus A collection of paths that facilitates data transmission from one part of the computer to another.

Business Continuance Volume (BCV) A copy of production volumes primarily used for recovery. It can also be used simultaneously for other business activities without affecting the production systems.

Business continuity (BC) Preparing for, responding to, and recovering from an outage that may adversely affect business operations.

Business Impact Analysis (BIA) A process of evaluating the effects of not performing a business function for a time period.

Cache A semiconductor memory where data is placed temporarily to reduce the time required to service I/O requests from the host.

Cache coherency Copies of the same data in two different cache addresses is maintained identical at all times.

Cache mirroring Each write to cache is held in two different memory addresses on two independent memory boards.

Cache vaulting The process of dumping the contents of cache into a dedicated set of physical disks during a power failure.

Call home Sends a message to the vendor's support center in the event of hardware or process failures.

Capacity management Ensures the adequate allocation of resources for all services based on their service level requirements.

Carrier Sense Multiple Access / Collision Detection (CSMA/CD) A set of rules specifying how network devices respond when two devices attempt to use a data channel simultaneously (called a *collision*).

Cascade/Multihop Replication whereby data flows from the source to the intermediate storage array, known as a *bunker*, in the first hop and then to a storage array at a remote site in the second hop.

C-CLIP A virtual container where CAS stores user data and its attributes as an object.

Challenge-Handshake Authentication Protocol (CHAP) Basic authentication used by initiator and target to authenticate each other via the exchange of a secret code or password.

Channel A high-bandwidth connection between a processor and other processors or devices.

Chargeback report A report that enables storage administrators to identify storage usage by an application/business unit in order to appropriately distribute storage costs across applications/business unit.

Checksum A redundancy check to verify data integrity by detecting errors in the data during transmission.

C-H-S addressing Use of physical addresses, consisting of the cylinder, head, and sector (CHS) number, for specific locations on the disk.

CLARiiON Messaging Interface (CMI) An interface used by the storage processors in a CLARiiON storage array to communicate with each other.

Class of Service (CoS) FC standards that differentiate between the quality of network services, treating each type as a class with its own level of service priority.

Client-initiated backup A manual/automatic backup process initiated by a client.

Client/server model A model in which a client requests and uses the services provided by a server that is capable of serving multiple clients at the same time.

Cluster (server) A collection of high-performance, interconnected computer servers working together as a single processing resource in an application environment in order to provide high availability.

Cold backup A backup that requires the application to be shut down.

Cold site A site where an enterprise's operations can be moved in the event of disaster—one with minimum IT infrastructure and environmental facilities in place, but not active.

Command Line Interface (CLI) An application user interface that accepts typed commands "one line" at a time in a command prompt window.

Command queuing An algorithm that optimizes the order in which received commands are executed.

Common Internet File System (CIFS) A Microsoft client/server application protocol that enables client programs to make requests for files and services on remote computers over TCP/IP.

Common Management Information Service (CMIS) A service that is used by network elements for network management.

Concatenation The process of logically joining address spaces of disks and presenting it as a single large address space.

Confidentiality Providing the required secrecy for information.

Consistency group A group of logical devices located on a single or multiple storage arrays and that need to be managed as a single entity.

Consistent split Multiple BCV mirrors are split simultaneously as one logical unit. This ensures data consistency across multiple volumes.

Console The primary interface to view, manage, configure, and handle reporting of various components (managed objects).

Content Address (CA) An identifier that uniquely addresses the content of a file and not its location.

Content Addressed Storage (CAS) An object-oriented system for storing fixed-content data. It provides a cost-effective networked storage solution.

Content authenticity Achieved at two levels: by generating a unique content address and by automating the process of continuously checking and recalculating the content address.

Content Descriptor File (CDF) An XML file that contains the content address and metadata of CAS objects.

Content handle A unique identifier of a CDF that contains the content address of the actual data in a CAS environment.

Content Protection Mirrored (CPM) The data object is mirrored for the total protection of data against failure.

Content Protection Parity (CPP) Data is transformed into segments, with an additional parity segment for the total protection of data against failure.

Continuous Data Protection (CDP) A technology whereby the recovery points or checkpoints are set with fine granularity so that data can be recovered without significant loss.

Control Path Cluster (CPC) A customized storage device with installed Invista software; it stores Invista configuration parameters.

Control station Provides dedicated processing capabilities to control, manage, and configure a NAS solution.

Copy on First Access (CoFA) A pointer-based full volume replication method that copies the data from source to target only when the write operation is issued on the source or a read/write operation is performed on the target for the first time. The replica is immediately available when the session starts.

Copy on First Write (CoFW) A pointer-based virtual replication method whereby data is copied to a predefined area in the array when a write occurs to the source or target for the first time.

Cryptography A technique for hiding information for the purpose of security.

Cumulative backup (differential backup) Copies the data that has changed since last full backup.

Cyclic redundancy check (CRC) A technique for detecting errors in digital data for verifying data integrity. In this method, a certain number of check bits, often called a checksum, are appended to the message being transmitted.

Cylinder A set of concentric, hollow, cylindrical slices through the platters in a HDD.

Data A piece of recorded information.

Data Access in Real Time (DART) Celerra's specialized operating system, which runs on the Data Mover.

Data center Provides centralized data processing capabilities to businesses. Its core elements are applications, databases, operating systems, networks, and storage.

Data Collection Policies (DCP) A predefined set of actions that an agent performs to gather information about objects.

Data compression The process of encoding information using fewer bits.

Data consistency The usability, validity, and integrity of related data components.

Data integrity The assurance that data is not modified unintentionally.

Data Mover An autonomous file server optimized for file serving used in EMC Celerra.

Data Path Controller (DPC) An intelligent SAN switch or director with Invista software installed. It receives I/O from the host and controls its attributes, such as target, LUN, and offset, within the logical unit.

Data security The means of ensuring both that data is safe from corruption and that its access is suitably controlled.

Data store The part of the cache that holds the data.

Data tampering Deliberate altering of data.

Data transfer rate The amount of data per second that a drive can deliver to the controller.

Defense in depth Implementing security controls at each access point of every access path.

Delta set Implementation of asynchronous replication uses large storage cache for temporarily buffering the outstanding writes assigned for the target. The buffered data represents the difference, or delta set, between the source and the target writes.

Denial-of-Service (DoS) attack An attack that denies the use of resources to legitimate users.

Dense Wave Division Multiplexing (DWDM) A technology that carries data from different sources together on an optical fiber, with each signal carried on its own separate wavelength.

Device driver Special software that permits the operating system and computer hardware device to interact with each other.

Differential split Synchronizes the primary mirror of a BCV device and its secondary mirror in a differential copy mode. This way, only tracks that changed on the standard device will propagate after the split to the other mirror of the BCV device.

Direct-attached backup A backup device attached directly to the backup client.

Direct-attached storage (DAS) Storage directly attached to a server or workstation.

Director Class of interconnection device that has large port count and redundant components for enterprise class connectivity requirements.

Directory A container in a file system that contains pointers to multiple files.

Directory service (DS) An application or a set of applications that stores and organizes information about a computer network's users and network resources. This enables network administrators to manage user access to the resources.

Directory System Agent (DSA) An LDAP directory that can be distributed among many LDAP servers. Each DSA has a replicated version of the full directory that is synchronized periodically.

Disaster recovery The process, policies, and procedures for restoring operations that are critical to the resumption of business, including regaining access to data.

Disaster recovery plan (DRP) A plan for coping with the unexpected or sudden loss of data access, with a focus on data protection. A part of business continuity planning.

Disaster restart The process of restarting business operations with consistent copies of data.

Discovery domain Provides a functional grouping of devices in an IP-SAN. In order for devices to communicate with one another, they must be configured in the same discovery domain.

Discretionary Access Control (DAC) An access policy determined by the owner of an object.

Disk-buffered replication A combination of local and remote replication technologies; it creates a local PIT replica first and then a remote replica of the local PIT replica.

Disk drive (HDD) A peripheral device used to store data persistently.

Disk partitioning The creation of logical divisions on a hard disk.

Distributed file system (DFS) A file system that is distributed across several computer nodes.

Domain Name System (DNS) Helps to translate human-readable host names into IP addresses.

Double buffering The buffering of data in two places. For example RDBMs use their own buffering along with file system buffering.

Downtime The amount of time during which a system is in an inaccessible state.

Dual-role node A node that provides both storage and access node capabilities.

Dynamic Host Configuration Protocol (DHCP) An approach to dynamically assigning an IP address to a host.

Encryption The process of transforming information using an algorithm (called a *cipher*) in order to make it unreadable to unauthorized users.

End-to-End Credit (EE-Credit) A mechanism that controls the data flow for class 1 and class 2 traffic using buffers.

Enterprise management platform (EMP) Integrated applications or suites of applications that manage and monitor the data center environment.

Enterprise Systems Connection (ESCON) An optical serial interface between IBM mainframe computers and peripheral devices.

Error-correction coding An encoding method that detects and corrects errors at the receiving end of data transmission.

Establish operation The process of attaching a BCV device to a standard device and synchronizing it with the standard device in TimeFinder/Mirror.

Expansion port (E_Port) A port used to connect two FC switches through an Inter-Switch Link (ISL).

Export Publishes the file system to UNIX clients that can mount or access the remote file system.

External transfer rate The rate at which data can be moved through the interface to the HBA.

Fabric A Fibre Channel topology with one or more switching devices.

Fabric Login (FLOGI) Login performed between an N_Port and an F_Port.

Fabric Loop port (FL_Port) A port on a switch that connects to a FC arbitrated loop.

Fabric port (F_Port) A port on the switch that connects an N_Port.

Fabric Shortest Path First (FSPF) Used in an FC network, a routing protocol that calculates the shortest path between nodes.

Failback This operation enables the resumption of normal business operations at the source site. Failback is invoked after a failover has been initiated.

Fan-in Qualified number of storage ports that can be accessed by a single initiator though a SAN.

Fan-out Qualified number of initiators that can access a single storage port though a SAN.

Fatal alert A warning about a condition requiring immediate attention because the condition may affect the overall performance or availability of the system.

Fault tolerance Describes a system or component designed in such a way that in the event of a failure, a backup component or procedure can immediately take its place with no loss of service.

Federated database A collection of databases that is treated as one entity and viewed through a single user interface.

Fibre Channel (FC) An interconnect that supports multiple protocols and topologies. Data is transferred serially on a variety of copper and optical links at a high speed.

Fibre Channel over IP protocol (FCIP) TCP/IP-based tunneling protocol for connecting Fibre Channel SANs over IP.

Field-Replaceable Unit (FRU) A component of a system that can be replaced only by a vendor engineer.

File-level access An abstraction of block-level access that hides the complexities of logical block addressing to the applications.

File-level virtualization Provides the independency between the data accessed at the file level and the location where the files are physically stored.

File Transfer Protocol (FTP) A network protocol that enables the transfer of files between computers over the Internet.

File server A server used to address file-sharing requirements.

File system A structured way of storing and organizing data in the form of files that represent a block of information.

Firewall A dedicated appliance, or software, that inspects network traffic passing through it and denies or permits passage based on a set of rules.

Firmware Software that is primed or embedded in a device.

Fixed-block architecture (FBA) A disk layout whereby each physical block on disk is the same size.

FLARE Special software designed for the operating environment of EMC CLARiiON.

Flushing The process of committing data from cache to disk.

Force flushing In case of a large I/O burst, this process forcibly flushes dirty pages onto the disk.

Frame A data stream that has been encoded by a data link layer for digital transmission over a node-to-node link.

Front-end controller Receives and processes I/O requests from the host and communicates with cache or the back end.

Front-end Port Provides the interface between the storage system and the host or interconnect devices (switch or director).

Full backup Copying of all data from source to backup device.

Full restore Entire data from the target is copied to the source. All data at the source is overwritten by the target data.

Full stroke The time taken by the read/write head to move across the entire width of the disk, from the innermost track to the outermost track.

Full-volume mirroring The target is attached to the source and established as the mirror of the source. This is accomplished by copying all the existing data and synchronously updating the target for each write on the source.

Gateway NAS A device consisting of an independent NAS head and one or more storage arrays.

Generic Framing Procedure (GFP) A multiplexing technique that enables the mapping of variable-length payloads into synchronous-payload envelopes.

Gigabit Interface Converter (GBIC) A transceiver that can convert electrical signals to optical signals and vice versa.

Global namespace Maps logical path names to physical locations.

Gold copy A copy of the replica device created prior to restarting applications using the replica device.

Graphical User Interface (GUI) An interface for issuing commands to a computer utilizing a pointing device, such as mouse, that manipulates and activates graphical images on a monitor.

Hard disk drive (HDD) A non-volatile storage device that stores digitally encoded data using rapidly rotating platters with magnetic surfaces.

Hard zoning/Port zoning Access to data is determined by the physical port to which a node is connected.

Heartbeat A messaging mechanism used by MirrorView software to determine whether a secondary device is available after it is determined unreachable.

Hierarchical Storage Management (HSM**)** Policy-based management that enables moving data from high-cost storage media to low-cost storage media.

High availability Ensures that no data is lost in the event of a disaster at the source.

High Performance Parallel Interface (HIPPI) A high-speed computer bus used to connect to a storage device.

High watermark The cache utilization level at which the storage system starts high-speed flushing of cache data.

Host A client or server computer that runs applications.

Host bus adapter (HBA) Hardware that connects a host computer to a storage area network or directly to a storage device.

Hot backup Backing up data when the application is up and running, with users accessing it.

Hot site A computer room with the required hardware, operating system, application, and network support to perform business operations in case of disaster or non-availability of an application.

Hot spare An idle disk drive that replaces a failed drive in any protected RAID group.

Hot swap The replacement of a hardware component with a similar one while the computer system using it remains in operation.

Hub An interconnectivity device that connects nodes in a logical loop whereby the nodes must share the bandwidth.

Hunt group Enables more than one port to respond to one alias address.

Idle flushing Continuous de-staging of data from cache to disk when the cache utilization level is between the high and low watermark.

In-band An implementation in which the virtualized environment configurations reside internal to the data path.

In-sync Implies that the primary logical device and secondary logical device contain identical data.

Incremental backup Copy of data that has changed since the last full or incremental backup, whichever has occurred more recently.

Information The knowledge derived from data.

Information Lifecycle Management (ILM) A proactive and dynamic strategy that helps businesses to manage the growth of information based on its business value.

Information Rights Management (IRM) A technology that protects sensitive information from unauthorized access; sometimes referred to as Enterprise Digital Rights Management.

Initiator A device that starts a data request.

Inode A data structure that contains information and is associated with every file and directory.

I/O burst A large number of writes that occur within a very short duration.

Input/Output channel (I/O channel) Provides the communication between the I/O bus and the CPU.

I/O controller Component that processes I/O requests one at a time.

Input Output per Second (IOPS) Number of reads and writes performed per second.

Integrated Device Electronics/Advanced Technology Attachment (IDE/ATA) Standard interface for connecting storage devices inside personal computers.

Integrated NAS A self-contained NAS environment that bundles together all the components of NAS, such as the NAS head, storage, and management functions.

Integrity checking Ensures that the content of a file matches the digital signature (hashed output or CA).

Interface A communication boundary between two elements, such as software, hardware device, or a user.

Internal transfer rate The speed at which data moves from the disk surface to the read/write heads.

Internet Engineering Task Force (IETF) The body that defines standard Internet operating protocols such as TCP/IP.

Internet Fibre Channel Protocol (iFCP) A protocol that enables native Fibre Channel devices in remote locations to be connected via an IP network.

Internet Protocol (IP) A protocol used for communicating data across a packet-switched network.

Internet Protocol Security (IPSec) A suite of algorithms, protocols, and procedures used for securing IP communications by authenticating and/or encrypting each packet in a data stream.

Internet Protocol Storage Area Network (IP SAN) Hybrid storage networking solutions that leverage IP networks.

Internet Small Computer System Interface protocol (iSCSI) An IP-based protocol built on SCSI. It carries block-level data over traditional IP networks.

Internet Storage Name Service (iSNS) A protocol that enables the automated discovery of storage devices on an IP network.

Inter-Switch Link (ISL) A link that connects two switches/fabrics through E_Ports.

Intrusion Detection/Intrusion Prevention System (IDS/IPS) A detection control that identifies intrusion in the IT systems and attempts to stop attacks by terminating a network connection or invoking a firewall rule to block traffic.

Jitter Unwanted variation in signal characteristics.

Journal file system A file system that uses a separate area called log or journal to track all the changes to a file system, enabling easy recovery in the event of a filesystem crash.

Jukebox Collections of optical disks in an "array" used to store and access fixed-content.

k28.5 A special 10-bit character used to indicate the beginning of a Fibre Channel command.

Kerberos A network authentication protocol that enables individuals communicating over a nonsecure network to prove their identity to one another in a secure manner.

Key Distribution Center (KDC) A Kerberos server that implements the authentication and ticket-granting services.

LAN-based backup Data to be backed up is transferred from the application server to the storage node over the LAN.

Landing zone The area of a hard disk where the R/W head rests on the platter near the spindle.

Latency Time delay between an I/O request and completion of that I/O.

Least Recently Used (LRU) A cache algorithm whereby addresses that have not been accessed for a long time are freed up or marked for reuse.

Level 1 (L1) cache An additional cache that is associated with the CPU. It holds data and program instructions that are likely to be needed by the CPU in the near future.

Lightweight Directory Access Protocol (LDAP) An application protocol for accessing an information directory over TCP/IP.

Link Aggregation Control Protocol (LACP) An IEEE standard for combining two or more physical data channels into one logical data channel for high availability.

Link Capacity Adjustment Scheme (LCAS) Specified in ITU-T G.7042, LCAS allows on-demand increases or decreases of the bandwidth of the virtual concatenated group.

Link Control Card (LCC) Provides connectivity among shelves of disks in a CLARiiON system. The LCC also monitors the field-replaceable units (FRUs) within the shelf and reports status information to the storage processor.

Load balancing A method of evenly distributing the workload across multiple computer systems, network links, CPUs, hard drives, or other resources in order to get optimal resource utilization.

Local Area Network (LAN) An IP based communication infrastructure that shares a common link to connect a large number of interconnecting nodes within a small geographic area (typically a building or campus).

Local bus or I/O bus A high-speed pathway that connects CPU and peripheral devices for data transfer.

Local replication The process of creating a copy of a production volume, within the same storage array (in the case of array-based local replication) or within the same data center (in the case of host-based local replication).

Log shipping A host based replication method whereby all activities at the source are captured into a "log" file and periodically shipped and applied to the remote site.

Logical arrays A subset of disks within an array that can be grouped to form logical associations—for example, a RAID set.

Logical Block Addressing (LBA) A method of addressing the location of a predefined storage space (block) using running numbers (ex: 1 to 65536) instead of cylinder-head-sector numbers.

Logical Unit Number (LUN) An identifier of a logical storage unit presented to a host for storing and accessing data on those units.

Logical volume Virtual disk partition created within a volume group.

Logical volume manager (LVM) Host-resident software that creates and controls host-level logical volumes.

Low watermark The point at which the storage system stops the forced flushing and returns to idle flush behavior.

LUN binding The process of creating LUNs within a RAID set.

LUN masking A process that provides data access control so that the host can see only the LUNs it is intended to access.

Magnetic tape A sequential storage medium used for data storage, backup, and archiving.

Mail or import/export slot A slot used to add or remove tapes from the tape-library without opening the access doors.

Management Information Base (MIB) A collection of objects in a (virtual) database used to manage entities (such as routers and switches) in a network.

Massive Array of Idle Disks (MAID) A system that uses a very large number of hard drives for near-line data storage. It is mostly used for write once, read occasionally applications.

Master agent Controls all agents on a host by starting and stopping the agents, and facilitates their remote installations and upgrades in an EMC ControlCenter environment.

Maximum Transmission Unit (MTU) A setting that determines the size of the largest packet that can be transmitted without data fragmentation.

Mean Time Between Failure (MTBF) A measure (in hours) of the average life expectancy of an individual component.

Mean Time To Repair (MTTR) The average time required to repair a faulty component.

Media Access Control (MAC) A mechanism to control physical media in a shared media network.

Memory virtualization A technique that gives an application program the impression that it has its own contiguous logical memory independent of available physical memory.

Metadata "Information about data" that describes the characteristics of data such as content, quality, and condition.

MetaLUN A logical unit that is expanded by aggregating multiple logical units.

Metropolitan Area Network (MAN) A large computer network usually spanning a city.

Mirroring A data redundancy technique whereby all the data is written to two disk drives simultaneously to provide protection against single-disk failure.

Mixed topology A backup topology that uses both LAN-based and SAN-based backup topologies.

Mixed zoning A combination of the WWN and port zoning technique.

Modification attack An unauthorized attempt to modify information for malicious purposes.

Monitoring The process of continuous collection of information and review of the entire storage infrastructure.

Most Recently Used (MRU) A cache algorithm whereby the addresses that have been accessed most recently are freed up or marked for reuse.

Mounting The process of making a file system usable by creating a mount point. The process of inserting a tape cartridge into a tape drive is also referred to as mounting.

Multicast Delivers frames to multiple destination ports at the same time.

Multimode Fiber (MMF) A fiber optic cable carrying multiple data streams in the form of light beams.

Multipathing Enables two or more data paths to be simultaneously used for read/write operations.

Multiplexing Transmitting multiple signals over a single communications line or channel.

Name server A host that implements a name service protocol.

Namespace An abstract container that provides context for the items it holds (e.g., names, technical terms, words).

Naviseccli A CLI-based (command-line interface) management tool to manage EMC CLARiiON.

Navisphere Analyzer A performance analysis tool for CLARiiON hardware components.

Navisphere Manager A GUI-based tool for centralized storage system management that is used to configure and manage CLARiiON.

Network A set of interconnected devices for resource sharing.

Network-attached storage (NAS) A dedicated file-serving device (with integrated or shared storage) attached to a local area network.

Network Data Management Protocol (NDMP) An open protocol used to control data backup and recovery communications between primary and secondary storage in a heterogeneous network environment.

Network File System (NFS) A common file-sharing method in UNIX environment.

Network Information System (NIS) Helps users identify and access a unique resource over the network.

Network Interface Card (NIC) Computer hardware designed for computers to communicate over an IP network.

Network latency Time taken for a packet to move from source to destination.

Network layer firewalls A firewall implemented at the network layer to examine network packets and compare them to a set of configured security rules.

Network portal A port to access any iSCSI node within a device.

Network Time Protocol (NTP) A protocol for synchronizing the clocks of computer systems over packet-switched, variable-latency data networks.

Network topology A schematic description of a network arrangement, including its nodes and connecting lines.

Network virtualization A technique for creating virtual networks, independent of the physical network.

Node A device or element connected in the network, such as a host or storage.

Node loop port (NL-Port) A node port that supports the arbitrated loop topology. This port is also known as the node loop port.

Node port (N-port) An end point in the fabric—typically a host port (HBA) or a storage array port that is connected to a switch in a switched fabric.

Non-protected restore A restore process in which the target remains attached to the source after the restore operation is complete and all the writes to the source are mirrored onto the target.

Non-repudiation Assurance that a subject cannot later deny having performed an action. Proof of delivery is provided in a communication for non-repudiation.

Normal Auto Contingent Allegiance (NACA) Controls the rules for handling an Auto Contingent Allegiance (ACA) condition caused by commands.

Offline mode (database replication) The database is not available for an I/O operation when replication takes place.

Online backup A form of backup in which the data being backed up may be accessed by applications.

Online Transaction Processing (OLTP) A system that processes transactions the instant the computer receives them and updates master files immediately.

Open file agents These agents interact directly with the operating system and enable the consistent backup of open files.

Operational backup Collection of data for the eventual purpose of restoring, at some point in the future, data that has become lost or corrupted.

Optical Disc Drive (ODD) A disk drive that uses laser light or electromagnetic waves near the light spectrum as part of the process of reading and writing data. It is a computer's peripheral device that stores data on optical discs.

Ordered set The low-level Fibre Channel (FC-1 layer) functions such as frame demarcation and signaling used for data transmission.

Out-of-band An implementation in which the virtualized environment configurations reside externally to the data path.

Out-of-sync Implies that the target data is not in a consistent state and requires full synchronization.

Packet loss When one or more packets of data traveling across a computer network fail to reach their destination.

Page A small unit of cache memory allocation.

Parity A mathematical construct that enables re-creation of the missing segment of data.

Parity bit An extra bit used in checking for errors in data bits during transmission. In modem communications, it is used to check the accuracy of each transmitted character.

Partition A logical division of the capacity of a physical or logical disk.

Passive attack An attempt to gain unauthorized access to information without altering it. Passive attacks may threaten the confidentiality of information.

Password A form of secret authentication data that is used to control access to a resource.

Payload Part of a data stream that represents user information and overhead, if any.

Performance Manager A performance analysis tool of EMC ControlCenter that provides the capability to quickly generate the performance and configuration reports.

Peripheral Component Interconnect (PCI) A standard bus for connecting I/O devices to a personal computer.

Platter One or more flat, circular disks found on a typical HDD. It is a rigid disk coated with magnetic material on both surfaces.

PLOGI (port login) Performed between one N_port (initiator) and another N_port (target storage port) to establish a session.

Point-in-time (PIT) copy A copy of data that contains a consistent image of the data as it appeared at a given point in time.

Port A physical connecting point to which a device is attached.

Portal group A group of network portals that can collectively support a multiple-connection session.

Pre-fetch (read ahead) In a sequential read request, a contiguous set of associated disk blocks that have not yet been requested by the host is read from the disk, and placed in cache in advance.

Primitive sequence An ordered set transmitted continually until a specified response is received, as defined in FC-1 layer.

Private loop An arbitrated loop without any switches.

Process login (PRLI) N_port to N_port login used to exchange service parameters. The PRLI verification process is dependent on the ULP.

Production data Data generated by an application hosted on a server.

Propagation Transmission (spreading) of signals through any medium from one place to other.

Propagation delay Amount of time taken by a packet to travel from its source to destination.

Protocol A set of rules or standards that enable systems or devices to communicate.

Protocol data unit (PDU) A message transmitted between two nodes on a network for communication.

Public Key Infrastructure (PKI) Software, hardware, people, and procedures that are used to facilitate the secure creation and management of digital certificates.

Public loop An arbitrated loop connected to a fabric through an FL_Port.

Quality of Service (QoS) A defined measure of performance in a data communication system.

Queue Location where an I/O request waits before it is processed by the I/O controller.

Quiescent state An application or device state in which the data is consistent. Processing is suspended, and tasks are either completed or not started.

Quota Restrictions specified at the user level about the maximum capacity allocated (e.g., the mailbox quota, the file system quota).

RAID controller Specialized hardware that performs all RAID calculations and presents disk volumes to host.

Random access memory (RAM) Volatile memory that allows direct access to any memory location.

Random I/O Consecutive I/O requests which do not access adjacent data locations in a storage system.

Raw partition A disk partition that is not managed by the volume manager.

Read-only memory (ROM) Non-volatile memory type in which data can be read but not written.

Read/write heads Components of the hard drive that read and write the data from or onto an HDD. Most drives have two read/write heads per platter, one for each surface of the platter.

Recoverability Ability of a replica to enable data restoration in order to resume business operations, with a predefined RPO and RTO, in the event of data loss or corruption.

Recovery Point Objective (RPO) Point in time at which systems and data must be recovered after an outage. It defines the amount of data loss that a business can endure.

Recovery Time Objective (RTO) Time within which systems, applications, or functions must be recovered after an outage. It defines the amount of downtime that a business can endure and survive.

Redundancy An inclusion of extra components (e.g., disk drive, HBA, link, or data) that enables continued operation if any of the working components fail.

Redundant Array of Independent Disks (RAID) Inclusion of a set of multiple independent disk drives in an array of disk drives, which yields performance exceeding that of a single large expensive drive.

Redundant Array of Inexpensive Nodes (RAIN) Data is replicated to multiple independent nodes to provide redundancy in CAS.

Registered State Change Notification (RSCN) Used to propagate information about changes in the state of one node to all other nodes in the fabric.

Reliability Assurance that a system will continue its normal business operations for a specific period under the given conditions.

Remote Authentication Dial-in User Service (RADIUS) An authentication, authorization, and accounting protocol for controlling access to network resources.

Remote backup A copy from the primary storage is performed directly to the backup media, which is located at another site.

Remote Procedure Call (RPC) A technology that enables a computer program to cause a subroutine or procedure to execute in another computer without the programmer explicitly coding the details for the remote interaction.

Remote replication Process of copying source data stored in a local storage array to an array located at a remote site.

Replica An image/copy of data usable by another application.

Repudiation attack An attack that denies or obfuscates the authorship of something.

Response time Amount of time a system or functional unit takes to react to a given input.

Restartability Determines the validity and usability of replicated data to restart business operations in the event of a disaster.

Restore To return data to its original or usable and functioning condition.

Resynchronization Process of restoring only the data blocks that are updated after the PIT is copied to the target.

Retention period Duration for which a business needs to retain the backup copies of data.

Reverse split Initiates a reverse data copy from the fixed BCV mirror to the primary mirror of a BCV upon the completion of a split operation. This PIT copy can then be used to recover the standard in the event of data loss or corruption.

Rewind time Time taken to rewind the tape to the starting position.

Risk analysis An analysis performed as part of the BC process that considers the component failure rate and average repair time, which are measured by MTTR and MTBF.

Robotic arms Component of a tape library, used for moving tapes from its slots to drive and back .

Role-based access control (RBAC) An approach to restricting system access to authorized users based on their respective roles.

Roll back Reverting a secondary replica to a previous point-in-time copy.

Rotation speed Speed at which a hard drive platter rotates.

Rotational latency Time taken by the platter to rotate and position the data location under the read/write head.

Round-robin I/O requests are assigned to each available path in rotation.

Round-trip delay (RTD) Delay between when data is sent and the acknowledgment is received from the remote site.

Router An inter-networking device that enables the routing of information between different networks.

SAN-based backup A method of backing up data over a SAN.

Save location A set of private LUNs that preserves PIT data just before it is updated at the source or the target by hosts.

SCSI Application Layer (SAL) An uppermost layer in the SCSI communication model, it contains both client and server applications that initiate and process SCSI I/O operations by using a SCSI application protocol.

SCSI Transport Protocol Layer (STPL) Contains the services and protocols that enable communication between an initiator and targets.

Sector Smallest individually addressable units of a disk drive on which data is physically stored.

Secure Shell (SSH) A network protocol that enables data to be exchanged over a secure channel between two computers.

Secure Sockets Layer (SSL) A cryptographic protocol that provides secure communications between a client and a server over the Internet, using public key cryptography.

Securities and Exchange Commission (SEC) A United States government agency that has the primary responsibility for enforcing the federal securities laws and regulating the securities industry/stock market.

Seek time The time required for the read/write heads in a disk drive to move between tracks of the disk.

Seek time optimization Commands are executed based on optimizing read/write head movements, which may result in improved response time.

Selective Acknowledge (SACK) With SACK, the data receiver can inform the sender about all segments that have arrived successfully, enabling the sender to retransmit only those segments that are actually lost.

SendTargetDiscovery A command issued by an initiator to begin the discovery process. The target responds with the names and addresses of the targets available to the host.

SEQ_ID An identifier of the frame as a component of a specific sequence and exchange as defined in FC-2 layer.

Sequence A contiguous set of frames that are sent from one port to another.

Serial Advanced Technology Attachment (SATA) A serial version of IDE/ATA, designed for serial transfer of data.

Server A computer system that provides services over the network to clients.

Server cluster Interconnected servers working together as a single processing resource in an application environment, for the purpose of high availability.

Server virtualization Enables multiple operating systems and applications to run simultaneously on different virtual machines created on a single or groups of physical servers.

Service-level agreement (SLA) An agreement between a provider and the consumer of a service.

Service Location Protocol (SLP or srvloc) A service discovery protocol that enables computers and other devices to find services in a local area network without prior configuration.

Service Set Identifier (SSID) A 32-character unique identifier attached to the header of packets sent over a WLAN that acts as a password when a mobile device tries to connect to the BSS.

Simple Mail Transfer Protocol (SMTP) The standard Internet e-mail protocol used for sending e-mail messages.

Simple Network Management Protocol (SNMP) A network management protocol used to monitor the health and performance of network-attached devices.

Single-instance Storage (SiS) Enables a system to avoid keeping multiple copies of user data by identifying each object using its unique object ID.

Single Large Expensive Drive (SLED) A single high-capacity, and generally more expensive, drive attached to a computer.

Single-Level Cell (SLC) A memory technology used in solid state drives that stores one bit on each memory cell, resulting in faster transfer speeds, lower power consumption, and higher cell endurance.

Single-mode fiber (SMF) A type of optical fiber that carries data in a form of a single ray of light projected at the center of the core.

Small Computer System Interface (SCSI) A popular storage interface used to connect a peripheral device to a computer and to transfer data between them.

Snapshot A point-in-time copy of data.

Snooping Unauthorized access to the data of another user or organization.

Soft zoning Use of WWNs to define zones. Also referred to as WWN zoning.

Solid-state drive (SSD) A data storage device that uses solid-state memory to store data persistently.

Source ID (S_ID) The standard FC address for the source port.

Spindle The part of the hard disk assembly that connects all platters and is connected to a motor.

Split operation Process of detaching a BCV from the standard device in TimeFinder/Mirror.

Spoofing A practice whereby one person or program successfully masquerades as another by falsifying data, thereby gaining an illegitimate advantage.

SRDF/Asynchronous (SRDF/A) A Symmetrix remote replication solution that enables the source to asynchronously replicate data, incorporating the delta set and dependent write consistency technology.

SRDF/Automated Replication (SRDF/AR) A Symmetrix remote replication solution that uses both SRDF and TimeFinder/Mirror to implement disk-buffered replication technology.

SRDF/Cluster Enabler (SRDF/CE) Enables server clustering whereby servers are distributed globally across multiple Symmetrix storage system environments, ensuring protection against site failure.

SRDF/Consistency Groups (SRDF/CG) A Symmetrix remote replication solution that ensures data consistency at the target in the event of a rolling disaster.

SRDF/Data Mobility (SRDF/DM) A Symmetrix remote replication solution that enables data center migration.

SRDF/Star A Symmetrix remote replication solution that implements three-site replication-triangle/multi-target technology.

SRDF/Synchronous (SRDF/S) A remote replication solution that creates a synchronous replica at one or more Symmetrix targets.

Standby Power Supply (SPS) A power supply that maintains power to cache for long enough to enable the content in cache to be copied to the vault.

State Change Notification (SCN) The notification sent to an iSNS server when devices are added or removed from a discovery domain.

Storage area network (SAN) A high-speed, dedicated network of shared storage devices and servers.

Storage array–based remote replication Replication that is initiated and terminated at the storage array.

Storage Management Initiative (SMI) A storage standard used to enable broad interoperability among heterogeneous storage vendor systems.

Storage Networking Industry Association (SNIA) A non-profit organization to lead the industry in developing and promoting standards, technologies, and educational services in order to empower organizations in the management of information.

Storage Node (Backup/Recovery) A part of the backup package that controls one or more backup devices (a tape drive, a tape library, or a backup to disk device) and receives backup data from backup clients.

Storage Node (CAS) Stores and protects data objects in a CAS system. Also referred to as back-end node.

Storage processor A component of CLARiiON array. Storage processors provide front-end and back-end connectivity and are configured in pairs for maximum availability.

StorageScope console A GUI-designed monitor that reports on all storage assets and their usage.

Store Receives data from agents, processes the data, and updates the repository.

Strip A group of contiguously addressed blocks within each disk of a RAID set.

Stripe A set of aligned strips that spans all the disks within a RAID set.

Stripe width Equal to the number of HDDs in the RAID array.

Striping The splitting and distribution of data across multiple HDDs.

Structured data Data that can be organized into rows and columns, and usually stored in a database or spreadsheet.

Stub file A small file, typically 8 KB, which contains metadata from the original file.

Superblock Contains important information about the file system, such as its type, creation and modification dates, size and layout of the file system, the count of available resources, and a flag indicating the mount status of the file system.

Swap file Also known as a page file or a swap space, this is a portion of the physical disk that is made to look like physical memory to the operating system.

Switched fabric A Fibre Channel topology whereby each device has a unique, dedicated I/O path to the device it is communicating with.

Switches More intelligent devices than hubs, switches directly route data from one physical port to another.

Switching A process of connecting network segments by using a hardware device called a *switch*.

Symmetrix Enginuity Symmetrix Enginuity is the operating environment for EMC Symmetrix.

Symmetrix Remote Data Facility (SRDF) Storage array–based remote replication software products supported by EMC Symmetrix.

Synchronous Digital Hierarchy (SDH) A standard developed by the International Telecommunication Union (ITU), documented in standard G.707 and its extension, G.708.

Synchronous Optical Networking (SONET) A standard for optical telecommunications transport whereby traffic from multiple subscribers is multiplexed together and sent out onto a ring as an optical signal.

System bus The bus that carries data between the processor and memory.

Tag RAM An integrated part of the cache that tracks the location of data in the data store; it is where the data is found in memory and where the data belongs on the disk.

Tape cartridges A device that contains magnetic tapes used for data storage.

Tape drive A data storage device that reads and writes data stored on a magnetic tape.

Target A SCSI device that executes a command to perform the task received from a SCSI initiator.

Target ID Uniquely identifies a target and is used as the address for exchanging commands and status information with initiators.

TCP/IP Offload Engine (TOE) card A TOE card offloads the TCP management functions from the host.

Threats Attacks that can be carried out on the IT infrastructure.

Throughput Measurement of the amount of data that can be successfully transferred within a set time period.

Tiered storage An environment that classifies storage into two or more tiers, based on differences in price, performance, capacity, and functionality.

Total Cost of Ownership (TCO) A financial estimate of direct and indirect costs for owning software or hardware.

Tracks The logical concentric rings on a disk drive platter.

Transfer rate throttle The SAN Copy transfer rate can be controlled by throttling network bandwidth. The throttle value ranges from 1 (low) to 10 (high).

Transmission code Used in FC primarily to improve the transmission characteristic of information across the fiber.

Transmission Control Protocol (TCP) A connection-based protocol that establishes a virtual session before information is sent from the source to the destination.

Transmission word A data transmission unit in FC-1 whereby each transmission word contains a string of four contiguous transmission characters or bytes.

Triangle/Multitarget A three-site remote replication process whereby data at the source site is replicated to an intermediate storage array (bunker) in the first hop and then to the remote storage array in the second hop.

Tunneling protocol A protocol that encapsulates the payload to a different delivery protocol in order to provide secure communication.

Universal Serial Bus (USB) A widely used serial bus interface to communicate with peripheral devices.

Unstructured data Data that has no inherent structure and is usually stored as different types of files.

Upper-layer protocol (ULP) Refers to a more abstract protocol when performing encapsulation.

User Datagram Protocol (UDP) A connectionless transport layer protocol used in IP.

User identifier (UID) Each user in a UNIX environment is identified using a unique UID.

Virtual Concatenation (VCAT) An inverse multiplexing technique to split the bandwidth equally into logical groups, which may be transported or routed independently.

Virtual LAN (VLAN) A switched network that is logically segmented by functions, project teams, or applications, regardless of the physical location of network users.

Virtual pools A logical group or cluster of resources.

Virtual private network (VPN) A secured dedicated communication network tunneled through another network.

Virtual storage area network (VSAN) A collection of ports from a set of connected Fibre Channel switches that form a virtual fabric.

Virtual tape library (VTL) Disk storage that is logically presented as tape libraries or tape drives to the application thorough emulation software.

Virtualization A technique of masking or abstracting physical resources by presenting a logical view of them.

Virus A malicious computer program that can infect a computer without permission or knowledge of the user.

Volume group (VG) A group of physical volumes (disk) from which a logical volume (essentially a partition) can be created.

Warning alert Conditions that require administrative attention in order to prevent the condition from becoming an event that affects accessibility.

Wavelength-Division Multiplexing (WDM) A technology that multiplexes multiple optical carrier signals on a single optical fiber by using different wavelengths of laser light to carry different signals.

Web-Based Enterprise Management (WBEM) A set of management and Internet standard architectures developed by the Distributed Management Task Force that leverages emerging web-based technologies.

Web console A web-based interface that enables remote as well as local network monitoring of the SAN.

Wide area network (WAN) Internetwork of computers that spans across geographical area (crossing metropolitan or even national boundaries); also used to interconnect multiple LANs.

World Wide Name (WWN) A vendor-supplied, 64-bit globally unique identifier number assigned to nodes and ports in a fabric.

World Wide Node Name (WWNN) A 64-bit node WWN used during fabric login.

World Wide Port Name (WWPN) A 64-bit port WWN used during fabric login.

Write aside size If an I/O request exceeds this predefined size, writes are directly sent to the disk, instead of written to cache. This reduces the impact of large writes consuming a large area of cache.

Write-back cache Data is placed in the cache and an acknowledgment is sent to the host immediately. Later, data from cache is committed (destaged) to the disk.

Write cache A portion of a cache set aside for temporarily storing data from a write operation before writing it to the disk for persistent storage.

Write Once Read Many (WORM) An ability of the storage device (such as optical disks) to write once and read many times.

Write penalty The I/O overhead in both mirrored and parity RAID configurations whereby every single write operation is manifested into additional write I/Os to the disks.

Write splitting A process of capturing writes and redirecting them—one to the source and one to the journal.

Write-through cache Data is placed in cache, written to the disk, and then acknowledged to the host.

ZIP A popular data compression and archival format.

Zone bit recording A method of recording data that takes advantage of the disk's geometry by storing more sectors per track on outer tracks than on inner tracks.

Zone set A group of zones that can be activated or deactivated as a single entity in a fabric. Zone sets are also referred to as *zone configurations*.

Zoning A fabric-level process that enables nodes within the fabric to be logically segmented into groups. Members of the zone can communicate only with each other.