HITACHI
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GLOSSARY SECTION

VSP 5000 series

Contents

Glossary

#

3DC

three-data-center. Refers to the local, intermediate, and remote sites, or data centers, in which TrueCopy and Universal Replicator combine to form a remote replication configuration.

In a 3DC configuration, data is copied from a local site to an intermediate site and then to a remote site (3DC cascade configuration), or from a local site to two separate remote sites (3DC multi-target configuration).

A

administrative logical unit (ALU)

An LU used for the conglomerate LUN structure, a SCSI architecture model. In the conglomerate LUN structure, all host access is through the ALU, which functions as a gateway to sort the I/Os for the subsidiary logical units (SLUs) grouped under the ALU.

The host requests I/Os by using SCSI commands to specify the ALU and the SLUs grouped under the ALU. An ALU is called a Protocol Endpoint (PE) in vSphere. See also *subsidiary logical unit (SLU)*.

ALU

See *administrative logical unit (ALU)*.

B

blade

A computer module, generally a single circuit board, used mostly in servers.

C

cache logical partition (CLPR)

Consists of virtual cache memory that is set up to be allocated to different hosts in contention for cache memory.

capacity

The amount of data storage space available on a physical storage device, usually measured in bytes (MB, GB, TB, and so on).

cascade configuration

In a 3DC cascade configuration for remote replication, data is copied from a local site to an intermediate site and then to a remote site using TrueCopy and Universal Replicator. See also *3DC*.

In a ShadowImage cascade configuration, two layers of secondary volumes can be defined for a single primary volume. Pairs created in the first and second layer are called cascaded pairs.

cascade function

A ShadowImage function that allows a primary volume (P-VOL) to have up to nine secondary volumes (S-VOLs) in a layered configuration. The first cascade layer (L1) is the original ShadowImage pair with one P-VOL and up to three S-VOLs. The second cascade layer (L2) contains ShadowImage pairs in which the L1 S-VOLs are functioning as the P-VOLs of layer-2 ShadowImage pairs that can have up to two S-VOLs for each P-VOL. See also *root volume*, *node volume*, *leaf volume*, *layer-1 (L1) pair*, and *layer-2 (L2) pair*.

cascaded pair

A ShadowImage pair in a cascade configuration. See also *cascade configuration*.

CCI

Command Control Interface

CG

See *consistency group (CTG)*.

CLPR

See *cache logical partition (CLPR)*.

command device

A dedicated logical volume used only by Command Control Interface and Business Continuity Manager to interface with the storage system. Can be shared by several hosts.

configuration definition file

A text file that defines the configuration, parameters, and options of Command Control Interface (CCI) operations. It also defines the connected hosts and the volumes and groups known to the CCI instance.

consistency group (CTG)

A group of copy relationships between virtual disks that are managed as a single entity. A group of pairs on which copy operations are performed simultaneously. When a CTG ID is specified for a specific operation, the operation is performed simultaneously on all pairs belonging to the CTG while keeping data consistency.

copy pair

A pair of volumes in which one volume contains original data and the other volume contains the copy of the original. Copy operations can be synchronous or asynchronous, and the volumes of the copy pair can be located in the same storage system (local copy) or in different storage systems (remote copy).

A copy pair can also be called a volume pair, or just pair. A pair created by Compatible FlashCopy® is called a relationship.

copy-on-write (COW)

Point-in-time snapshot copy of any data volume within a storage system. Copy-on-write snapshots only store changed data blocks, therefore the amount of storage capacity required for each copy is substantially smaller than the source volume.

COW

See *copy-on-write (COW)*.

COW Snapshot

Hitachi Copy-on-Write Snapshot

D

data consistency

When the data on the secondary volume is identical to the data on the primary volume.

data path

The physical paths used by primary storage systems to communicate with secondary storage systems in a remote replication environment.

data pool

One or more logical volumes designated to temporarily store original data. When a snapshot is taken of a primary volume, the data pool is used if a data block in the primary volume is to be updated. The original snapshot of the volume is maintained by storing the changeable data blocks in the data pool.

delta resync

A disaster recovery solution in which TrueCopy and Universal Replicator systems are configured to provide a quick recovery using only differential data stored at an intermediate site.

device

A physical or logical unit with a specific function.

device emulation

Indicates the type of logical volume. Mainframe device emulation types provide logical volumes of fixed size, called logical volume images (LVIs), which contain EBCDIC data in CKD format. Typical mainframe device emulation types include 3390-9 and 3390-M. Open-systems device emulation types provide logical volumes of variable size, called logical units (LUs), that contain ASCII data in FBA format. The typical open-systems device emulation type is OPEN-V.

differential data

Changed data in the primary volume not yet reflected in the secondary volume of a copy pair.

disaster recovery

A set of procedures to recover critical application data and processing after a disaster or other failure.

disk adapter (DKA)

The hardware component that controls the transfer of data between the drives and cache. A DKA feature consists of a pair of boards.

disk controller (DKC)

The hardware component that manages front-end and back-end storage operations. The term DKC can refer to the entire storage system or to the controller components.

DKA

See *disk adapter (DKA)*.

DKC

See *disk controller (DKC)*.

DKCMAIN

disk controller main. Refers to the microcode or software for the storage system.

DP-VOL

Dynamic Provisioning virtual volume. A virtual volume that has no memory space that is used by Dynamic Provisioning.

DRU

Hitachi Data Retention Utility

Dynamic Provisioning (HDP)

An approach to managing storage. Instead of "reserving" a fixed amount of storage, it removes capacity from the available pool when data is actually written to disk.

E

emulation

The operation of a storage system to emulate the characteristics of a different storage system. For device emulation, the mainframe host recognizes the logical devices on the storage system as 3390-x devices. For controller emulation, the mainframe host recognizes the control units (CUs) on the storage system as 2105 or 2107 controllers.

The storage system operates the same as the storage system being emulated.

ext.

external

external volume

A logical volume whose data resides on drives that are physically located outside the Hitachi storage system.

F

FC

Fibre Channel; FlashCopy

free capacity

The amount of storage space (in bytes) that is available for use by the host systems.

G

GUI

graphical user interface

H

HDP

Hitachi Dynamic Provisioning. See *Dynamic Provisioning*.

HDT

Hitachi Dynamic Tiering

Hitachi Vantara

Hitachi Vantara

HORC

Hitachi Open Remote Copy. Another name for Hitachi TrueCopy®.

HORCM

Hitachi Open Remote Copy Manager. Another name for Command Control Interface.

host failover

The process of switching operations from one host to another host when the primary host fails.

host group

A group of hosts of the same operating system platform.

I

I/O

input/output

I/O mode

I/O actions on the primary volume and secondary volume of a global-active device pair.

initial copy

An initial copy operation is performed when a copy pair is created. Data on the primary volume is copied to the secondary volume before any updates are processed.

intermediate site (I-site)

A site that functions as both a TrueCopy secondary site and a Universal Replicator primary site in a 3-data-center (3DC) cascading configuration.

internal volume

A logical volume whose data resides on drives that are physically located within the storage system. See also *external volume*.

J

JNLG

See *journal group (JNLG)*.

journal group (JNLG)

In a Universal Replicator system, journal groups manage data consistency between multiple primary volumes and secondary volumes. See also *consistency group (CTG)*.

journal volume

A volume that records and stores a log of all events that take place in another volume. In the event of a system crash, the journal volume logs are used to restore lost data and maintain data integrity.

In Universal Replicator, differential data is held in journal volumes until you copy it to the S-VOL.

L

L1 pair

See *layer-1 (L1) pair*.

L2 pair

See *layer-2 (L2) pair*.

layer-1 (L1) pair

In a ShadowImage cascade configuration, a layer-1 pair consists of a primary volume and secondary volume in the first cascade layer. You can pair an L1 primary volume with up to three L1 secondary volumes. See also *cascade configuration*.

layer-2 (L2) pair

In a ShadowImage cascade configuration, a layer-2 (L2) pair consists of a primary volume and secondary volume in the second cascade layer. You can pair an L2 primary volume with up to two L2 secondary volumes. See also *cascade configuration*.

LBA

logical block address

LDEV

See logical device.

LDKC

See *logical disk controller (LDKC)*.

leaf volume

A layer-2 secondary volume in a ShadowImage cascade configuration. The primary volume of a layer-2 pair is called a node volume. See also *cascade configuration*.

license key

A specific set of characters that unlocks an application and allows it to be used.

local copy

See *in-system replication*.

logical device (LDEV)

An individual logical device (on multiple drives in a RAID configuration) in the storage system. An LDEV might or might not contain any data and might or miight not be defined to any hosts. Each LDEV has a unique identifier, or address, within the storage system. The identifier is composed of the logical disk controller (LDKC) number, control unit (CU) number, and LDEV number. The LDEV IDs within a storage system do not change.

An LDEV formatted for use by mainframe hosts is called a logical volume image (LVI). An LDEV formatted for use by open-system hosts is called a logical unit (LU).

logical disk controller (LDKC)

A group of 255 control unit (CU) images in the RAID storage system that is controlled by a virtual (logical) storage system within the single physical storage system. For example, the Hitachi Universal Storage Platform V storage system supports two LDKCs, LDKC 00 and LDKC 01.

logical unit (LU)

A volume, or LDEV, created in an open storage system, or configured for use by an open-systems host, for example, OPEN-V.

logical unit (LU) path

The path between an open-systems host and a logical unit.

logical unit number (LUN)

A unique management number that identifies a logical unit (LU) in a storage system. A logical unit can be an end user, a file, a disk drive, a port, a host group that is assigned to a port, an application, or virtual partitions (or volumes) of a RAID set.

Logical unit numbers (LUNs) are used in SCSI protocols to differentiate disk drives in a common SCSI target device, such as a storage system. An open-systems host uses a LUN to access a particular LU.

logical volume (LV)

See *volume*.

logical volume image (LVI)

An LDEV that is configured for use by mainframe hosts (for example, 3390-3).

LU

See *logical unit (LU)*.

LUSE

LUN expansion; LU size expansion

LUSE volume

A combined LU composed of multiple OPEN-*x* devices. A LUSE device can be from 2 to 36 times larger than a fixed-size OPEN-*x* LU. LUSE lets the host access the data on the storage system using fewer LU numbers.

LV

logical volume. See *volume*.

M

main control unit (MCU)

A storage system at a primary, or main, site that contains primary volumes of remote replication pairs. The main control unit (MCU) is configured to send remote I/O instructions to one or more storage systems at the secondary, or remote, site, called remote control units (RCUs). RCUs contain the secondary volumes of the remote replication pairs. See also remote control unit (RCU).

main site

See *primary site*.

Mb

megabit

MB

megabyte

Mbps

megabits per second

MBps

megabytes per second

MCU

See main control unit.

MF, M/F

mainframe

MIH

missing interrupt handler

mirror

In Universal Replicator, each pair relationship in and between journal groups is called a "mirror." Each pair is assigned a mirror ID when it is created. The mirror ID identifies individual pair relationships between journal groups.

MP

microprocessor

MU

mirror unit

N

node volume

A layer-2 primary volume in a ShadowImage cascade configuration. The secondary volume of a layer-2 pair is called a leaf volume. See also *cascade configuration*.

NUM

number

O

OPEN-V

A logical unit (LU) of user-defined size for use by open-systems hosts.

OPEN-x

A logical unit (LU) of fixed size (for example, OPEN-3, OPEN-9) that is used primarily for sharing data between mainframe and open-systems hosts using Hitachi Cross-OS File Exchange.

P

P-VOL

See primary volume.

pair

Two logical volumes in a replication relationship in which one volume contains original data to be copied and the other volume contains the copy of the original data. The copy operations can be synchronous or asynchronous, and the pair volumes can be located in the same storage system (in-system replication) or in different storage systems (remote replication).

pair status

Indicates the condition of a copy pair. A pair must have a specific status for specific operations. When a pair operation completes, the status of the pair changes to a different status determined by the type of operation.

parity group

See *RAID group*.

PG

parity group. See *RAID group*.

pool

A set of volumes that are reserved for storing Hitachi Thin Image data or Dynamic Provisioning write data.

pool volume (pool-VOL)

A logical volume that is reserved for storing snapshot data for Thin Image operations or write data for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe, active flash, or active flash for mainframe.

A logical volume that is reserved for storing snapshot data for Thin Image operations or write data for Dynamic Provisioning, Dynamic Tiering, or active flash.

PPRC

Peer-to-Peer Remote Copy

primary site

The physical location of a storage system that contains original data to be replicated and that is connected to one or more storage systems at a remote or secondary site via remote copy connections. A primary site can also be called a “main site” or “local site”.

The term "primary site" is also used for host failover operations. In that case, the primary site is the location of the host on which the production applications are running, and the secondary site is the location of the host on which the backup applications that run when the applications at the primary site have failed.

primary volume (P-VOL)

The volume in a copy pair that contains the original data to be replicated. The data on the P-VOL is duplicated synchronously or asynchronously on the secondary volume (S-VOL).

The following Hitachi products use the term P-VOL: Thin Image, Copy-on-Write Snapshot, ShadowImage, TrueCopy, Universal Replicator, Universal Replicator for Mainframe, and High Availability Manager.

See also *secondary volume*.

Q

quick format

The quick format feature in Virtual LVI/Virtual LUN in which the formatting of the internal volumes is done in the background. This allows system configuration (such as defining a path or creating a TrueCopy pair) before the formatting is completed. To execute quick formatting, the volumes must be in blocked status.

quick restore

A reverse resynchronization in which no data is actually copied: the primary and secondary volumes are swapped.

quick split

A split operation in which the pair is split, and then the differential data is copied to the secondary volume (S-VOL). Any remaining differential data is copied to the S-VOL in the background. The benefit is that the S-VOL becomes immediately available for read and write I/O.

quorum disk

Used to determine the volume in the global-active device pair on which server I/O should continue when a failure occurs in a path or a storage system. Quorum disks reside in an external storage system.

R

R/W

read/write

RAID

redundant array of inexpensive disks

RAID group

A redundant array of inexpensive drives (RAID) that have the same capacity and are treated as one group for data storage and recovery. A RAID group contains both user data and parity information, which allows the user data to be accessed in the event that one or more of the drives within the RAID group are not available. The RAID level of a RAID group determines the number of data drives and parity drives and how the data is "striped" across the drives. For RAID1, user data is duplicated within the RAID group, so there is no parity data for RAID1 RAID groups.

A RAID group can also be called an array group or a parity group.

RAID level

The type of RAID implementation. RAID levels include RAID 0, RAID 1, RAID 2, RAID 3, RAID 4, RAID 5 and RAID 6.

RCU

See *remote control unit (RCU)*.

remote control unit (RCU)

A storage system at a secondary, or remote, site that is configured to receive remote I/O instructions from one or more storage systems at the primary, or main, site. See also main control unit.

remote site

See *secondary site*.

resync

resynchronize

RMI

Remote Method Invocation

root volume

A layer-1 primary volume in a ShadowImage cascade configuration. The secondary volume of a layer-1 pair is called a node volume. See also *cascade configuration*.

RTC

real-time clock

RTO

recovery time objective

S

S#

serial number

S/N

serial number

s/w

software

SAS

serial-attached SCSI

SC

storage control

SCDS

source control dataset

SCI

state change interrupt

scripting

The use of command line scripts, or spreadsheets downloaded by Configuration File Loader to automate storage management operations.

SCSI

Small Computer System Interface. A standard that defines I/O buses primarily intended for connecting storage systems and devices to hosts through host bus adapters.

secondary site

The physical location of the storage system that contains the primary volumes of remote replication pairs at the primary site. The storage system at the secondary site is connected to the storage system at the primary site via remote copy connections. The secondary site can also be called the "remote site". See also *primary site*.

secondary volume (S-VOL)

The volume in a copy pair that is the copy of the original data on the primary volume (P-VOL). The following Hitachi products use the term "secondary volume": Thin Image, Copy-on-Write Snapshot, ShadowImage, TrueCopy, Universal Replicator, Universal Replicator for Mainframe, and High Availability Manager.

See also *primary volume*.

service information message (SIM)

Messages generated by a RAID storage system when it detects an error or service requirement. SIMs are reported to hosts and displayed on Device Manager - Storage Navigator.

service processor (SVP)

The computer inside a RAID storage system that hosts the Device Manager - Storage Navigator software and is used by service personnel for configuration and maintenance of the storage system.

severity level

Applies to service information messages (SIMs) and Device Manager - Storage Navigator error codes.

shared volume

A volume that is being used by more than one replication function. For example, a volume that is the primary volume of a TrueCopy pair and the primary volume of a ShadowImage pair is a shared volume.

SI

Hitachi ShadowImage®

sidefile

An area of cache memory that is used to store updated data for later integration into the copied data.

SIM

service information message

SIz

Hitachi ShadowImage® for Mainframe

size

Generally refers to the storage capacity of a memory module or cache. Not usually used for storage of data on disk or flash drives.

SLU

See *subsidiary logical unit*.

SM

shared memory

SN

serial number; Device Manager - Storage Navigator

snapshot

A point-in-time virtual copy of a Hitachi Thin Image primary volume (P-VOL). The snapshot is maintained when the P-VOL is updated by storing pre-updated data (snapshot data) in a data pool.

space

Generally refers to the storage capacity of a data drive (for example, hard disk drive, flash drive).

SS

snapshot

SSB

sense byte

SSD

solid-state drive. Also called flash drive.

SSID

See *storage subsystem identifier*.

storage subsystem identifier (SSID)

In a mainframe environment, SSIDs are used for reporting information from the control unit (CU) image to the mainframe operating system. An SSID is assigned to each group of 64 or 256 volumes to define one or four SSIDs per CU image. The user-specified SSIDs are assigned during storage system installation and must be unique to all connected host operating environments.

subsidiary logical unit (SLU)

An LU used for the conglomerate LUN structure, a SCSI architecture model. An SLU is an LU that stores actual data. You can use a DP-VOL or snapshot data (or a V-VOL allocated to snapshot data) as an SLU. All host access to SLUs is through the administrative logical unit (ALU). An SLU is called a virtual volume (VVol) in vSphere. See *administrative logical unit*.

T

T10 PI

See *T10 Protection Information*.

T10 Protection Information (T10 PI)

A code standard defined in SCSI. T10 PI adds 8-byte protection information at every 512 bytes to validate data. By combining T10 PI with Data Integrity Extension (DIX), which enables data protection covering application and operating system, data protection from application to disk drives can be provided.

TC

Hitachi TrueCopy®

TCz

Hitachi TrueCopy® for Mainframe

TID

target ID

total capacity

The aggregate amount of storage space in a data storage system.

U

update copy

An operation that copies differential data on the primary volume of a copy pair to the secondary volume. Update copy operations are performed in response to write I/Os on the primary volume after the initial copy operation is completed.

UR

Hitachi Universal Replicator

UR

Hitachi Universal Replicator

URz

Hitachi Universal Replicator software for Mainframe

URz

Hitachi Universal Replicator software for Mainframe

V

V

version; variable length and de-blocking (mainframe record format)

V-VOL

See *virtual volume*.

V-VOL management area

Contains the pool management block and pool association information for Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, and Dynamic Tiering for Mainframe, and Thin Image operations. The V-VOL management area is created automatically when additional shared memory is installed.

VB

variable length and blocking (mainframe record format)

virtual device (VDEV)

A group of logical devices (LDEVs) in a RAID group. A VDEV typically consists of some fixed volumes (FVs) and some free space. The number

of fixed volumes is determined by the RAID level and device emulation type.

Virtual LVI/LUN

A custom-size volume whose size is defined by the user using Virtual LVI/LUN. Also called a custom volume (CV).

virtual volume (V-VOL)

A logical volume in a storage system that has no physical storage space. Hitachi Thin Image uses V-VOLs as secondary volumes of copy pairs. In Hitachi Dynamic Provisioning, V-VOLs are referred to as DP-VOLs.

VOL, vol

See *volume (VOL or vol)*.

volume (VOL or vol)

A logical device (LDEV), or a set of concatenated LDEVs in the case of LUSE, that has been defined to one or more hosts as a single data storage unit. An open-systems volume is called a logical unit (LU), and a mainframe volume is called a logical volume image (LVI).

volume pair

See *copy pair*.

W

write order

The order of write I/Os to the primary volume (P-VOL) of a copy pair. The data on the secondary volume (S-VOL) is updated in the same order as on the P-VOL, particularly when there are multiple write operations in one update cycle. This feature maintains data consistency at the secondary volume. Update records are sorted in the cache at the remote system to ensure proper write sequencing.