

HP StorageWorks Business Copy EVA administrator guide

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About this guide

This guide describes HP StorageWorks Business Copy EVA (local replication) and its setup, operation, and management.

For the latest information about HP Business Copy EVA, see *HP StorageWorks EVA replication software consolidated release notes*. The location of this and other documents mentioned in this guide is provided in "[Related documentation](#)" on page 7.



NOTE:

This guide does not describe HP Business Copy EVA/MA/EMA 2.3 or earlier. To obtain guides for these versions, contact HP Services.

Intended audience

This guide is intended for operators and administrators of storage area networks (SANs) that include HP StorageWorks Enterprise Virtual Arrays (EVAs). Readers should be familiar with:

- LANs
- SANs
- EVAs

Prerequisites

Use of this product requires prior installation of:

- EVA hardware and controller software
- HP StorageWorks Command View EVA
- HP StorageWorks Business Copy EVA license(s)

For supported storage arrays, management server hardware and software, and replication environments, including restrictions, see *HP StorageWorks EVA software compatibility reference*.

Related documentation

The following documents are referenced in this guide:

- *HP StorageWorks Command View EVA user guide*
- *HP StorageWorks Replication Solutions Manager administrator guide*
- *HP StorageWorks Replication Solutions Manager online help and user guide*
- *HP StorageWorks EVA software compatibility reference*
- *HP StorageWorks EVA replication software consolidated release notes*
- *HP StorageWorks Enterprise Virtual Array (EVA) updating product software guide* for your EVA model and controller software version

You can find these documents from the Manuals page of the HP Business Support Center web site:

<http://www.hp.com/support/manuals>

In the Storage section, click **Storage software** and then select your product.

Document conventions and symbols

Table 1 Document conventions

| Convention | Element |
|--|---|
| Blue text: Related documentation | Cross-reference links and e-mail addresses |
| Blue, underlined text (http://www.hp.com) | Web site addresses |
| Bold text | <ul style="list-style-type: none">• Keys that are pressed• Text typed into a GUI element, such as a box• GUI elements that are clicked or selected, such as menu and list items, buttons, tabs, and check boxes |
| <i>Italic</i> text | Text emphasis |
| Monospace text | <ul style="list-style-type: none">• File and directory names• System output• Code• Commands, their arguments and argument values |
| <i>Monospace, italic</i> text | <ul style="list-style-type: none">• Code variables• Command variables |
| Monospace, bold text | Emphasized monospace text |

 **CAUTION:**

Indicates that failure to follow directions could result in damage to equipment or data.

 **IMPORTANT:**

Provides clarifying information or specific instructions.

 **NOTE:**

Provides additional information.

 **TIP:**

Provides helpful hints and shortcuts.

HP technical support

Telephone numbers for worldwide technical support are listed on the HP support web site: <http://www.hp.com/support/>.

Collect the following information before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Error messages
- Operating system type and revision level
- Detailed questions

For continuous quality improvement, calls may be recorded or monitored.

Subscription service

HP recommends that you register your product at the Subscriber's choice for business web site: <http://www.hp.com/go/e-updates>.

After registering, you will receive e-mail notification of product enhancements, new driver versions, firmware updates, and other product resources.

HP web sites

For additional information, see the following HP web sites:

- <http://www.hp.com>
- <http://www.hp.com/go/storage>
- http://www.hp.com/service_locator
- <http://www.docs.hp.com>

Documentation feedback

HP welcomes your feedback.

To make comments and suggestions about product documentation, please send a message to storagedocs.feedback@hp.com. All submissions become the property of HP.

Product feedback

To make comments and suggestions about HP StorageWorks HP Business Copy EVA, please send a message to EVAReplication@hp.com.

1 HP Business Copy EVA

HP Business Copy EVA is the local replication component of the HP Enterprise Virtual Array. With HP Business Copy EVA licenses and a supporting user interface, you can create point-in-time copies of virtual disks and use them to back up and restore application data.

This chapter describes HP Business Copy EVA features and concepts, as well as supporting products and interfaces.

Features

HP Business Copy EVA features enable you to:

- Create point-in-time copies, called snapshots, snapclones, and mirrorclones, of virtual disks
- Specify snapshot, snapclone, and mirrorclone properties; such as redundancy (Vraid) level, read cache, and write protection
- Present snapshots, snapclones, and mirrorclones as disks to hosts
- Allow immediate host I/O to snapshots and snapclones
- Instantly restore the content of a virtual disk using a snapshot, snapclone, or mirrorclone

Features vary based on the array controller software version. For specific supported features and maximums, see *HP StorageWorks EVA software compatibility reference*.

Specialized replication user interfaces, such as HP Replication Solutions Manager, offer additional features.

Local replication concepts

Local replication is the production of point-in-time copies called snapclones, snapshots, and mirrorclones, as described in the following topics.

Snapclones

A snapclone is an independent, point-in-time copy of a virtual disk. It is independent because all of the data from the source virtual disk is copied to the snapclone. Use snapclones when you need independent and durable copies; for example, for data mining, data warehousing, or preproduction testing.

Follow these guidelines for using snapclones:

- The array must have a local replication license.
- A snapclone can be in a different disk group than the source.
- The redundancy (Vraid) level of a snapclone can be any level relative to the source (see "[Vraid hierarchy](#)" on page 15).
- Until a snapclone is normalized, another snapclone of the same source cannot be created.

Snapclones cannot be created when the disk to be replicated is:

- A snapshot
- A disk that has a snapshot
- In the process of normalizing or being deleted

Snapshots

A snapshot is a dependent, point-in-time copy of a virtual disk. It is dependent because data is not actually copied to the snapshot until it is overwritten on the source. Use snapshots when you need temporary copies, for example, to create a copy of a database that you then store on tape.

Snapshot types

Snapshot types are defined by how the array allocates space for the snapshot.

- **Demand allocated**—The array allocates only enough space to store metadata and pointers to the source data. As the source is overwritten, the array allocates more space and copies the original data to the snapshot. Use demand allocated snapshots when less than 10–25% of the capacity of the source will change over the lifetime of the snapshot.
- **Fully allocated**—The array allocates space equal to the capacity of the source virtual disk, plus space for metadata and pointers to the source data. As the source is overwritten, the array copies the original data to the snapshot. Use fully allocated snapshots when more than 25% of the capacity of the source will change over the lifetime of the snapshot.

Snapshot guidelines

Follow these guidelines for using snapshots:

- The array must have a local replication license.
- The maximum number of snapshots per source varies based on the array controller software version. For specifics, see *HP StorageWorks EVA software compatibility reference*.
- A snapshot is created in the same disk group as the source virtual disk.
- The redundancy (Vraid) level of a snapshot must be the same as, or lower than, the source (see "[Vraid hierarchy](#)" on page 15).
- All snapshots of the same virtual disk must be the same type (demand allocated or fully allocated) and redundancy (Vraid) level.
- If the disk group has insufficient space for demand-allocated snapshots, the array stops writing to both the source and the snapshots.
- Snapshots are included in the maximum number of virtual disks per array.

Snapshots cannot be created when the disk to be replicated is:

- A snapshot
- In the process of normalizing or being deleted

Mirrorclones

Mirrorclone replication establishes and maintains a copy of an original virtual disk via a local replication link. When first created (and whenever resynchronized by an action or command), a mirrorclone is said to be synchronized. In a synchronized state, the mirrorclone is automatically updated whenever the source virtual disk is updated. When local replication between a synchronized mirrorclone and its source is stopped by an action or command, the mirrorclone is said to be fractured. In a fractured state, the mirrorclone is not updated when the source virtual disk is updated. At the instant replication is stopped, the mirrorclone is a point-in-time copy of its source.

This feature is only available with certain controller software versions.

Mirrorclone guidelines

Follow these guidelines for using mirrorclones:

- The array must have a local replication license.
- A mirrorclone can be in a different disk group than the source. For optimum protection from hardware failures, HP recommends creating a mirrorclone in a different disk group than the source. (A mirrorclone is created in the same disk group as its source, unless specified otherwise.)
- The redundancy (Vraid) level of a mirrorclone can be the same, lower, or higher than the source.
- The maximum number of mirrorclones per source is one.
- A mirrorclone cannot be a member of (added to) a DR group.
- A detached mirrorclone cannot be reattached to its source.

A mirrorclone cannot be created if the intended source virtual disk is:

- A snapshot or has any snapshots.
- Has any snapclones that are in the process of being normalized.
- A member of a DR group. Further, when a virtual disk becomes the source of a mirrorclone, that source virtual disk cannot be added to a DR group later.

Synchronized mirrorclone guidelines

Follow these guidelines for using synchronized mirrorclones:

| Synchronized mirrorclone tasks | |
|--------------------------------|--|
| Deleting | No. The disk must first be fractured and detached, then deleted. |
| Detaching | No. The disk must first be fractured, then detached. |
| Fracturing | Yes. |
| Presenting | No. The disk must first be fractured, then presented. |
| Replicating | No. The disk must first be fractured, then replicated. |
| Restoring | No. The disk must first be fractured, then used to restore. |
| Resynchronizing | Not applicable. |

Fractured mirrorclone guidelines

Follow these guidelines for using fractured mirrorclones:

| Fractured mirrorclone tasks | |
|-----------------------------|--|
| Deleting | No. The disk must first be detached, then deleted. |
| Detaching | Yes. |
| Fracturing | Not applicable. |
| Presenting | Yes. The disk can immediately be presented to hosts for I/O. |
| Replicating — snapclones | No. |
| Replicating — snapshots | Yes. Multiple snapshots are allowed. |
| Restoring | Yes. The disk must be unrepresented first. |
| Resynchronizing | Yes. The disk must be unrepresented first. |

Mirrorclone states

The following mirrorclone states are reported by the replication manager.

| Mirrorclone state | Remarks |
|----------------------------|---|
| Fractured | There is no replication activity between the mirrorclone virtual disk and its source virtual disk. At the instant of the fracture, data on the mirrorclone is identical to its source. After a fracture, data on the two disks may no longer be identical due to host I/O to the source or the mirrorclone. |
| Restore in progress | In response to a replication command, data is being copied from the mirrorclone virtual disk to its original source virtual disk. Data on the original source is not yet identical to its mirrorclone. |
| Synchronized or normalized | The source virtual disk and its mirrorclone are synchronized. Data on the mirrorclone is identical to its source. Any changes to data on the source virtual disk are automatically copied to its mirrorclone. |
| Sync in progress | In response to a replication command, data is being copied from the source virtual disk to its mirrorclone virtual disk. Data on the mirrorclone is not yet identical to its source. |

Instant restore

The instant restore feature is only available with certain controller software versions. Restore operations are instantaneous because the restored data is available within seconds for host reads/writes (the actual data transfer occurs in the background).

The following types of instant restore are available:

- **Instant restore from mirrorclones.** The content of a virtual disk is instantly restored by copying point-in-time data from the disk's mirrorclone.
- **Instant restore from snapclones.** The content of a virtual disk is instantly restored by copying point-in-time data from one of the disk's snapclones.
- **Instant restore from snapshots.** The content of a virtual disk is instantly restored by copying point-in-time data from one of the disk's snapshots.

Containers

A container is disk space that is preallocated for later use as a snapclone or snapshot. Snapshots and snapclones that are created using containers are called preallocated snapshots and preallocated snapclones, respectively. Use containers when you need faster copies, for example, to reduce the time a host application is suspended for a backup.

Follow these guidelines for using containers:

- The array must have a local replication license.
- A container can be in a different disk group than the source of the preallocated snapclone or snapshot.
- A container must be the same size as the source of the preallocated snapclone or snapshot.
- The redundancy (Vraid) level of the container determines the redundancy (Vraid) level of a preallocated snapclone.
- For a preallocated snapshot, the redundancy (Vraid) level of the container must be the same or lower than the source. If the source has other snapshots, the redundancy (Vraid) level of the container must be the same as the other snapshots. For descriptions of redundancy (Vraid) levels, see "[Vraid hierarchy](#)" on page 15.
- Containers cannot be presented to hosts or used for storage.
- Virtual disks can be converted to containers.

Containers cannot be created from a virtual disk that is:

- A snapshot
- Presented to a host
- In the process of normalizing or being deleted

Vraid hierarchy

Vraid levels provide the following relative redundancy:

- Vraid1 is the highest redundancy level and uses the most raw capacity.
- Vraid5 is a medium redundancy level. It uses less raw capacity than Vraid1 but more raw capacity than Vraid0.
- Vraid0 is the lowest redundancy level and uses the least raw capacity.

Supporting products and interfaces

You need at least one of the products described in [Table 2](#) to perform local replication.

Table 2 Replication products and interfaces

| HP product | Interface | Remarks |
|---|------------------------------|--|
| HP StorageWorks Command View EVA | Browser-based GUI | <ul style="list-style-type: none"> • Required, purchased with HP EVAs • Array management software that also creates snapshots, snapclones, mirrorclones, and DR groups • Replicates by specifying an array and virtual disk, not a host and host volume • Does not mount volumes or otherwise interact with hosts • Does not provide jobs, job templates, or scripting |
| HP StorageWorks Replication Solutions Manager | Browser-based GUI and CLUI | <ul style="list-style-type: none"> • Optional, provided with HP Business Copy EVA and HP Continuous Access EVA • A specialized replication interface that creates snapshots, snapclones, mirrorclones, and DR groups • Replicates by specifying an array and virtual disk, a host and host volume, or an application database • Mounts volumes and interacts with hosts • Provides integrated job editor, job templates, and job scripting • Requires a LAN connection to hosts |
| HP StorageWorks Storage System Scripting Utility (SSSU) | Host command line | <ul style="list-style-type: none"> • Optional, provided with HP EVAs • EVA host platform software that creates snapshots, snapclones, and DR groups • Replicates by specifying an array and virtual disk, not by a host and host volume • Mounts volumes and interacts with hosts through custom scripts |
| HP StorageWorks SMI-S Interface for Command View EVA | WBEM client-server using XML | <ul style="list-style-type: none"> • Optional, provided with HP Command View EVA • Provides an SMI-S compliant interface for HP Command View EVA |
| HP OpenView Storage Data Protector | GUI | <ul style="list-style-type: none"> • Optional purchased product • Automates tasks and provides instant recovery using HP Data Protector extensions for HP EVAs • Executes snapshots using an HP Data Protector agent to communicate with HP Command View EVA |
| HP StorageWorks Fast Recovery Solution | GUI | <ul style="list-style-type: none"> • Optional purchased product • Provides fast recovery when Microsoft Exchange 2000 and SQL 2000 databases are damaged • Requires use of a local replication interface to create one or two copies of production databases |
| HP StorageWorks DButil | API | <ul style="list-style-type: none"> • Optional, provided with HP Business Copy EVA on the HP Replication Solutions Manager host agents CD • Copy the utility from the CD to the host and run it from a command line • Places the SQL Server 2000 database in a transactionally consistent state before creating a snapclone or snapshot • Suspends writes to the database for the duration of the replication operation • Supports scripts that can be integrated into batch files to automate these processes |

2 Setting up local replication

The installation services purchased with your array include the following prerequisites for HP Business Copy EVA:

- EVA hardware and controller software
- HP Command View EVA

This chapter describes additional required and optional setup for local replication.

Local replication environment

In a typical setup (Figure 1), a management server (3) is running HP Command View EVA and local replication software such as HP Replication Solutions Manager. If HP Replication Solutions Manager is present, a LAN (1) connects the management server to hosts (5) that are running replication host agents. The hosts contain database and backup applications that perform I/O on storage arrays (6) in the SAN (2). An administrator or operator performs replication tasks from a browser on a remote computer (4) from the management server, or from a host using a command line interface.

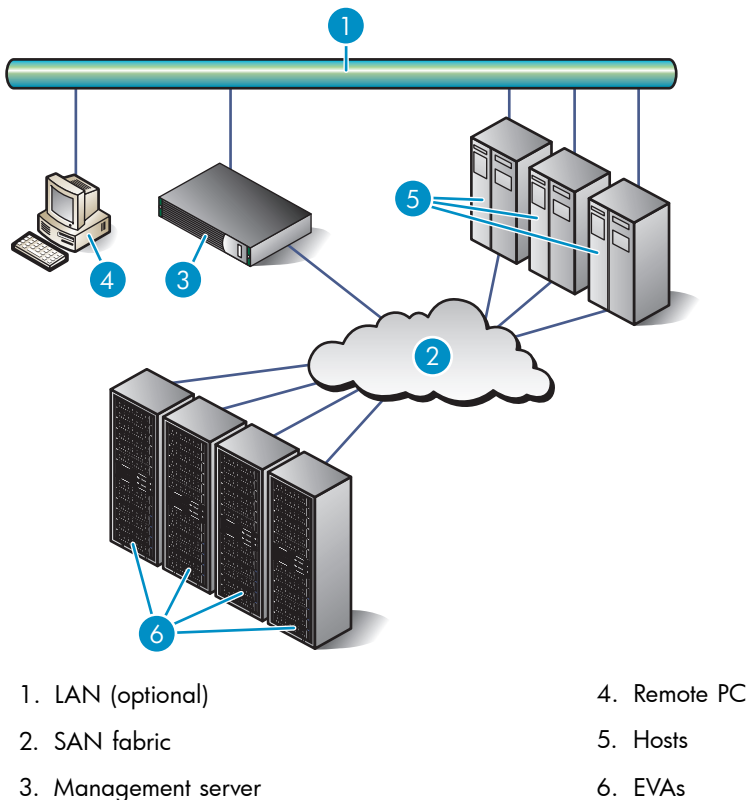


Figure 1 Local replication environment

Upgrading controller and management software

Local replication features vary based on the array controller software version. Learn the controller software version of each array whose data is to be replicated. Upgrade the controller software, if necessary, to obtain the latest HP Business Copy EVA features. For information about the HP Business

Copy EVA features supported by specific controller software versions, see *HP StorageWorks EVA software compatibility reference*. For instructions on upgrading controller software, see *HP StorageWorks Enterprise Virtual Array (EVA) updating product software guide* for your array model and controller software version.

If needed, upgrade HP Command View EVA to a compatible version (see *HP StorageWorks EVA software compatibility reference*).

Installing HP Business Copy EVA licenses

An HP Business Copy EVA license-to-use (LTU) is required for each array that requires snapshots or snapclones. Replication licenses are based on the amount (in TB) of replicated data on each array. For license offerings, see the product QuickSpecs on the HP Business Copy EVA web site.

Follow the instructions provided in the license kit for retrieving electronic license keys from the HP License Key Renewal web site and for installing the keys using HP Command View EVA. Entering the keys on the HP Command View EVA license page activates local replication features on the specified arrays.

Installing optional replication software

Install optional replication products, such as HP Replication Solutions Manager, that can help meet your replication needs. For a feature comparison, see [Table 2](#). For installation requirements and instructions, see the product installation guide.

Configuring disk groups for local replication

Initializing an array creates a default disk group of at least eight disks. For optimum availability, create additional disk groups and use them for the snapclones of application data. Using multiple disk groups allows you to store snapclones in a disk group other than the disk group where the source disks reside. For example, store the snapclone of a database or the database log files in a disk group different from the disk group where the application resides. If the primary disk group fails, you can use the snapclone or log files from the other disk group to recover the data. For examples, see "[Using two disk groups](#)" on page 18 and "[Using three disk groups](#)" on page 19.

To control the number and composition of the disk groups in the array, install only the disks that you want in the first disk group, and then initialize the array. Add disks and create additional disk groups as needed. For instructions on initializing the array and adding disk groups, see *HP StorageWorks Command View EVA user guide* and *HP StorageWorks Command View EVA online help*. Also see the EVA best practices white paper.

Using two disk groups

To prevent data loss using two disk groups, each disk group must contain sufficient independent information to reconstruct all application data from the last backup. A practical example of this is a database that contains data files, configuration files, and log files. Place the data files in one disk group and duplex or mirror the log files to the data file disk group and another disk group to ensure that loss of a single disk group does not affect data recovery.

For example:

- Disk Group 1 contains data files, a copy of online redo logs, a copy of the control file, and an optional copy of archived logs (if supported by the database or OS).
- Disk Group 2 contains a copy of the online redo logs, a copy of the control file, the primary archive log directory, and an optional snapclone of the data files for Disk Group 1.

Using three disk groups

An alternative configuration is two separate disk groups for the log and control files, and a third disk group for the data files. This configuration has a slightly higher cost but provides symmetry.

- Disk Group 1 contains database data files.
- Disk Group 2 contains the database log, control file, and archived log files.
- Disk Group 3 contains a database log copy, control file copy, and archived log files copy (if supported by the database or OS).

Creating virtual disks

Setup is complete when you have virtual disks to replicate. Using HP Business Copy EVA assumes that the array is initialized, disk groups created, hosts added, and virtual disks created and presented. See the HP Command View EVA description in [Table 2](#) for more information.

3 Managing local replication

This chapter describes common replication management tasks.

Monitoring snapshot space

Demand-allocated snapshots must be able to grow as the source or snapshot is modified, otherwise all snapshots in the disk group become inoperative. As demand-allocated snapshots grow, the capacity available to create virtual disks decreases. Before you allocate space for new virtual disks, ensure that you reserve enough space for all demand-allocated snapshots in the disk group.

The capacity required for a demand-allocated snapshot depends on how much of the source disk is modified. This value is unique for each application, but can range from 0% to 100% of the source disk capacity. If you do not know the capacity required for a demand-allocated snapshot, HP recommends that you reserve 10% of the capacity of the source virtual disk times the number of snapshots of the source disk. For example, if you have two demand-allocated snapshots of a 500 GB virtual disk, you would reserve 100 GB (500 GB x 10% x 2) of usable capacity. Compute the usable capacity using the redundancy (Vraid) level selected for the snapshot. If the availability of demand-allocated snapshots is critical for application availability, overestimating the requirements for free space may be warranted.

Always monitor free space. In addition to demand-allocated snapshots, a disk failure and the subsequent reconstruction can also compete for free space. After a reconstruction, the reserved space requirements for the disk protection level can cause existing snapshots to exceed available free space and thus all snapshots to become inoperative.

Optimizing performance

Snapclones operate independently of the workload (the copy operation is initiated by the snapclone request), whereas snapshot activity is driven by the workload and, by design, must compete with the I/O workload on the disks. For the best snapshot and snapclone performance, create and delete snapshots and snapclones during low-demand periods, or configure the array to meet performance demands during snapshot and snapclone activities.

Using containers

There are three steps to the creation of a snapclone or snapshot:

1. Metadata management—The creation of the internal data structures of the snapshot or snapclone
2. Write cache flush—The array's write cache is flushed to ensure that the data on the source disk is current before the disk is copied
3. Data movement—The copying of the data

When you create a container, the first step of snapshot or snapclone creation (metadata management) is completed. Therefore, when you eventually create a snapshot or snapclone using a container, that first step of metadata management is eliminated, which saves time during the snapshot or snapclone creation. Using containers greatly improves system response time during snapclone and snapshot creation. If you create containers during low-demand periods, you can further reduce the impact on the system workload.

Minimizing snapclone workloads

A snapclone copies the entire source disk without stopping. However, creating a snapclone creates an additional workload on the snapclone's disk group while the data is being copied. You may observe an

increase in command response time and a decrease in the disk group's maximum I/O during the copy operation. The performance impact ceases when the copy operation completes.

For optimum snapclone performance:

- Create snapclones during low-demand periods.
- Keep virtual disks as small as possible.
- Minimize the number of concurrent snapclone operations (use fewer virtual disks).
- Organize clone operations into consistency groups of virtual disks, and then clone consistency groups sequentially.

Minimizing the number of snapshots

Snapshots copy data as it changes on the source disk. The performance impact is less than for snapclones. For many applications, less than 10% of the data on a virtual disk changes over the life of the snapshot. When this 10% has been copied, the performance impact ceases. Also, in typical workloads, the performance impact decreases exponentially over time as the source and snapshot virtual disks diverge. In other words, the performance impact is greater on a new snapshot than on an old snapshot and, unlike snapclones, occurs during the host write operation.

For optimum snapshot performance:

- Minimize the number of virtual disks with snapshot copies. Use fewer virtual disks; it is better to have a few large virtual disks than many small virtual disks.
- Minimize the number of snapshots for a virtual disk. Do not keep extra snapshots without a reason or plan for their use.
- Minimize the life of a snapshot. If snapshot copies are used for backup, consider deleting the snapshot after saving the copy on tape.
- Delete snapshots in age order, oldest first.

Setting cache to write-through before a snapshot or snapclone

The array automatically flushes the write cache before copying data to a snapclone or snapshot. You can reduce the performance impact of creating a snapshot or snapclone by presetting the write cache on the source disk to write-through mode. The performance benefit is greatest when there are multiple snapshots or snapclones for a single source disk. Be sure to re-enable write caching after the copy is initiated.

Suspending DR group before a snapshot

In remote replication configurations, you can improve system performance by temporarily suspending a DR group before creating a snapshot of the destination virtual disk.

The performance impact of an improperly sized (in a performance sense) snapshot or snapclone can cause HP Continuous Access EVA to suspend replication. System and application performance and availability can be improved when replication is suspended as a planned event rather than an unplanned disruption.

Minimizing simultaneous replication operations

Minimize the number of simultaneous replication requests to the same array. Too many simultaneous local replication events can reduce array performance.

Avoid multiple simultaneous replication requests to a single virtual disk. Multiple replication events on the same virtual disk can reduce performance and cause automated jobs to fail. For example, if the maximum number of snapshots per virtual disk is exceeded when a job attempts to create a snapshot, the job will fail.

When scheduling replication jobs, consider the timing relative to other jobs on the same array, host, or management server. Tune and balance demands to maximize performance.

Backing up replication configurations

HP recommends that you back up replication jobs and configurations regularly using EVA or other software. HP Storage System Scripting Utility and HP Replication Solutions Manager provide GUI and CLUI backup features. See the software documentation for specific backup procedures. Regular backups ensure that job and configuration data can be easily restored during planned or unplanned maintenance of the management server.

Upgrading replication software

Replication components have many dependencies and relationships to other SAN components. For supported versions of related products, see *HP StorageWorks EVA software compatibility reference* on the HP Business Copy EVA web site. When upgrading replication management software, consider compatibility with management servers, hosts, and browsing machines.

If replication host agents are installed, typical host compatibility issues include:

- Operating system type and version
- File system types
- Logical volume manager type and version
- Cluster software type and version
- Fibre Channel HBA type and driver version
- Multipath software type and version

Typical compatibility issues of browsing machines include:

- Operating system type and version
- Browser type and version
- JRE type and version

Glossary

This glossary defines terms that are used in this guide or are related to the software.

| | |
|---|---|
| array | See storage system and virtual array . |
| client | An intelligent device that requests services from other intelligent devices. In the context of HP Replication Solutions Manager, a client is a computer that is used to access the software remotely using a supported browser. |
| Data replication (DR) group | A logical group of virtual disks in a remote replication relationship with a corresponding group on another array. |
| enabled host | A host that is equipped with a replication host agent. |
| EVA | Enterprise Virtual Array. An HP StorageWorks product that consists of one or more virtual arrays. See also virtual disk . |
| failover | An operation that reverses replication direction so that the destination becomes the source and the source becomes the destination. Failovers can be planned or unplanned and can occur between DR groups, managed sets, fabrics or paths, and array controllers. |
| general-purpose server | A server that runs customer applications such as file and print services. HP Command View EVA and HP Replication Solutions Manager can be used on a general purpose server in limited configurations. |
| host | A computer that runs user applications and uses (or potentially uses) one or more virtual disks that are created and presented by the array controller. |
| job | A repeatable custom script that automates replication tasks. A job can be simple (for example, create a DR group) or complex (for example, perform cascaded replication). Jobs can be run from the GUI, from the command line, from batch files, or by a scheduler. |
| management server | A server where HP StorageWorks Enterprise Virtual Array (EVA) management software is installed, including HP Command View EVA and HP Replication Solutions Manager, if used. A dedicated management server runs EVA management software exclusively. Other management servers are general-purpose servers, HP ProLiant Storage Server (NAS) models, and the Storage Management Appliance. |
| normalization | The background process of copying the contents of a source virtual disk to a snapclone. The snapclone is dependent on the source until normalization is complete. Also called unsharing. |
| Storage Management Appliance (SMA) | HP OpenView Storage Management Appliance, an HP hardware-software product designed to run SAN management applications such as HP Command View EVA and HP Replication Solutions Manager. |
| storage system | Synonymous with virtual array. The HP Enterprise Virtual Array consists of one or more storage systems. See also virtual disk . |

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| Universal Naming Convention (UNC) | Referenced in many Edit panels of verbs in the Jobs Creation Interface. |
| virtual array | Synonymous with disk array and storage system, a group of disks in one or more disk enclosures combined with control software that presents disk storage capacity as one or more virtual disks. <i>See also virtual disk.</i> |
| virtual disk | Variable disk capacity that is defined and managed by the array controller and presentable to hosts as a disk. |

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