

HP-UX Logical Volume Manager and MirrorDisk/UX Release Notes

HP-UX 11i v3 March 2009 (B.11.31)

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Logical Volume Manager and MirrorDisk/UX Release Notes

About this Document

This document provides information about the Logical Volume Manager (LVM) and MirrorDisk/UX products in the March 2009 release of HP-UX 11i v3.

LVM and MirrorDisk/UX Overview

Logical Volume Manager (bundle BaseLVM) is the HP-UX default Volume Manager. It provides the user with flexibility in configuring and managing mass storage resources. In HP-UX 11i v3, the LVM kernel and commands are bundled with the core HP-UX product.

MirrorDisk/UX (bundle B2491BA) is an optionally purchased HP-UX product to enable LVM mirroring functionality.

Overview of Changes

The initial HP-UX 11i v3 release of LVM and MirrorDisk/UX was integrated with the new mass storage stack, delivering significant performance, scalability, availability, and usability enhancements. LVM was enhanced to support larger logical volumes, temporary quiescing of volume groups, and striping with mirroring. Volume group availability was improved: resizing a LUN and modifying volume group characteristics no longer required the volume group to be recreated, and replacing a disk could be done online.

The March 2009 release of LVM and MirrorDisk/UX provides migration capabilities, enables a volume group to take advantage of LUN expansion, contraction, and reprovisioning online, and provides performance enhancements.

New and Changed Features in This Release

New Features

The following LVM features are new with the March 2009 release of HP-UX 11i v3:

Migration

The new `vgversion` command enables you to perform the following migrations for existing volume groups:

- Version 1.0 volume groups to either Version 2.0 or Version 2.1 volume groups
- Version 2.0 volume groups to Version 2.1 volume groups
- Version 2.1 volume groups to Version 2.0 volume groups

For more information, see `vgversion(1M)`.

Changed Features

The following features have changed in the March 2009 release of LVM and MirrorDisk/UX:

vgmodify Enhancements

The `vgmodify` command supports the following new features for Version 2.0 and higher volume groups:

- Online reprovisioning

Enables you to modify the volume group configuration parameters without deactivating the volume group. For example, to change the maximum size of active volume group `vg02`, enter:

```
# vgmodify -a -S 32900g /dev/vg02
```

- Online dynamic LUN contraction

Enables you to prepare a physical volume for a LUN contraction using disk utilities without deactivating the volume group. For example, to prepare active volume group `vg02` for LUN contraction to 400 megabytes on physical volume `/dev/rdisk/disk32`, enter:

```
# vgmodify -a -C 400m /dev/vg02 /dev/rdisk/disk32
```

- Online dynamic LUN expansion

Enables you to take advantage of the increased disk size of a physical volume without deactivating the volume group.

For example, to reconfigure an activated volume group to take advantage of a physical volume size increase, use the `-E` and `-a` options to `vgmodify`. For example, if volume group `vg02` on physical volume `/dev/disk/disk32` has been expanded, use the following command to add physical extents to it:

```
# vgmodify -a -E /dev/vg02 /dev/rdisk/disk32
```

The `vgmodify` command supports the following new features for Version 1 volume groups:

- Online Reprovisioning

Enables you to modify the volume group configuration parameters without deactivating the volume group. For example, to change the maximum number of physical extents for volume group `vg02`, enter:

```
# vgmodify -a -e 8000 /dev/vg01
```

- Online and Offline LUN Contraction

Enables you to prepare a physical volume for a LUN contraction using disk utilities while the volume group is online or offline. For example, to prepare offline volume group `vg01` on physical disk `/dev/rdisk/disk38` for LUN contraction, enter:

```
# vgmodify -C 400m /dev/vg01 /dev/rdisk/disk38
```

To prepare online volume group `vg01` on physical disk `/dev/rdisk/disk38` for LUN contraction, enter:

```
# vgmodify -a -C 400m /dev/vg01 /dev/rdisk/disk38
```

For more information, see `vgmodify(1M)`.

vgscan and vgimport Performance Improvement

The performance of the `vgscan` and `vgimport` commands is improved for Version 2.0 and higher volume groups.

Deprecated or Obsolete Features

No LVM or MirrorDisk/UX features are deprecated or obsolete in the March 2009 release of HP-UX 11i v3.

Known Problems Fixed in This Version

The following table lists the known LVM and MirrorDisk/UX problems fixed in the March 2009 release of HP-UX 11i v3.

Table 1 LVM Fixes in HP-UX 11i v3 March 2009

Defect ID	Description
QXCR1000824861	In all localized utf8 locales, all LVM display commands produce output with corrupted characters, truncations, and misalignment.
QXCR1000827038	When a volume group (VG) is in a deactivated state, if you issue the <code>vgchange -a n</code> command, the system returns the <code>strerror</code> message.
QXCR1000843064	In an HP Serviceguard cluster, a system can panic during the recovery of a server for a 2.x volume group, if a physical volume is unavailable.
QXCR1000843538	If a VG with a logical volume (LV) that has Mirror Write Cache (MWC) enabled is activated after a system failure, the activation can hang.
QXCR1000848376	In an HP Serviceguard cluster, a system can panic when quiescing a shared version 2.0 volume group.
QXCR1000850334	In an HP Serviceguard cluster, a System can panic after cross activation and adding mirror to LV.
QXCR1000854405	During volume group activation of a volume group containing logical volumes that do not have MWC enabled, if an LV was not closed properly during previous deactivation, LVM marks all the extents stale except one. Currently, LVM is picking the first available fresh copy, but few times it is picked from the unavailable physical volume (PV).
QXCR1000865844	In an HP Serviceguard cluster, deactivation can fail on some nodes of a cluster if a server has failed.
QXCR1000870963	The <code>vgimport</code> command fails to verify the unique LVM disk ID on HP-UX 11i v3.
QXCR1000874763	The system panics during a DLKM unload of the <code>lvmp</code> module because of a race condition.
QXCR1000878178	On systems without an <code>/etc/lvmtab_p</code> file, unloading the <code>lvmp</code> module can generate extraneous <code>vgdisplay</code> messages.
QXCR1000887104	Using LVM 2.0 and higher volumes with physical volumes (PV) groups that have physical extents (PEs) greater than 65535 can cause data corruption. Issuing <code>lvsync</code> and <code>vgsync</code> commands marks the extents as current, but after an activation cycle, the extents are stale.

Known Problems and Limitations

No known problems were identified for this release of LVM and MirrorDisk/UX.

Installation Requirements

This section describes the installation requirements for this release.

Required Hardware

LVM and MirrorDisk/UX have no hardware requirements beyond the requirements of the HP-UX 11i v3 operating system. Both products run on all supported HP 9000 and HP Integrity servers.

Required Software

Because LVM is installed with the HP-UX 11i v3 operating environment, there are no software requirements beyond the requirements of the HP-UX 11i v3 operating system. MirrorDisk/UX requires the BaseLVM product.

Required Patches

In HP-UX 11i v3, LVM and MirrorDisk/UX do not require any software patches.

For each of the following subsystems, you can download patches from the following website:

<http://www2.itrc.hp.com/service/patch/mainPage.do>

Mass Storage Critical Resource Analysis

The Mass Storage Critical Resource Analysis (MS CRA) tool checks for a maximum of two mirror copies of a logical volume. However, Version 2.0 and higher volume groups allow up to five mirror copies. To enable MS CRA to check for a maximum of five mirror copies of a volume, you must install the following patch, or a superseding patch:

- PHCO_37562

MS CRA checks for a maximum of 511 physical volumes in a volume group. However, Version 2.1 volume groups allow up to 2048 physical volumes. To enable MS CRA to check for a maximum of 2048 physical volumes in a volume group, you must install the following patch:

- PHCO_38145

PHCO_38145 supersedes PHCO_37562. Installing PHCO_38145 enables both checks.

mkfs and mkboot Commands

The `mkfs` and `mkboot` commands check whether a specified disk device is being used by LVM; if so, they display an error message. For these commands to correctly check whether a device is part of a Version 2.x volume group, you must install the following patches:

- PHCO_37328
- PHCO_37340
- PHCO_37394

These patches are delivered in the `FEATURE11i` bundle.

HP Serviceguard

To support Version 2.0 volume groups, HP Serviceguard 11.18 requires the April 2008 patch. Customers requiring Version 2.1 volume group support or Version 2.0 and higher cluster lock disks must install the HP Serviceguard September 2008 patch. For more information, see the *HP Serviceguard Version A.11.18 Release Notes*.

VxVM 4.1 Commands

Several VxVM 4.1 commands check whether a specified disk device is being used by LVM before overwriting it. For these commands to correctly check whether a device is part of a Version 2.x volume group, you must install the following patch:

- PHCO_37836

Required Disk Space

Since LVM is installed with the HP-UX 11i v3 operating environment, it consumes no additional disk space.

MirrorDisk/UX consumes no additional disk space aside from a license key.

Compatibility Issues

This release is specific for HP-UX 11i v3 (B.11.31). The following compatibility issues exist in the March 2009 release of HP-UX 11i v3.

Version 2.1 Volume Groups

- Version 2.1 volume groups are not recognized on previous releases of HP-UX, including versions of HP-UX 11i v3 prior to the September 2008 release. Version 1.0 volume groups are supported on all supported versions of HP-UX, including 11i v1, 11i v2, and 11i v3.
- The following HP-UX products do not currently support Version 2.0 or Version 2.1 volume groups:
 - HP Process Resource Manager (HP PRM)
 - Encrypted Volume and File System (EVFS v1.0)

These products plan to add support of Version 2.x volume groups. For the most recent information on these products, see the IT Resource Center (ITRC) at <http://itrc.hp.com>, or consult the release notes for the specific product.

Moving from HP-UX 11i v2 to HP-UX 11i v3

If you are migrating a system from HP-UX 11i v2 to HP-UX 11i v3, see the LVM migration white paper described in “Related Documentation”. It contains information on migrating an LVM configuration from the legacy naming model to the agile naming model.

Existing LVM configurations created on HP-UX 11i v2 continue to work on HP-UX 11i v3 under the legacy naming model. However, there is a change in behavior for **Alternate Links (PVLINKS)**:

In HP-UX 11i v3, management of multipathed devices is available outside of LVM using the next generation mass storage stack. By default, the next generation mass storage stack distributes I/O requests across all available paths to a multipathed disk, even when using legacy device special files. Using LVM with persistent or legacy device special files might cause I/O requests to be sent across alternate links, even if the links are not configured as PVLINKS; this does not introduce any errors, but it does differ from PVLINK behavior in previous releases.

When using LVM configuration commands on legacy device special files, LVM does not select an alternate path if the path corresponding to the specified device special file is unavailable, unless the unavailable path and the alternate path are configured as part of an active volume group.

When using LVM configuration commands on persistent device special files, LVM succeeds if at least one of the paths to the device is available.

HP recommends converting volume groups with multipathed disks to persistent device special files and using native multipathing, as described in the migration white paper in “Related Documentation”.

However, if you want backward-compatible PVLink behavior, you must use legacy device special files for physical volumes, and disable the mass storage stack multipathing for those physical volumes. To disable multipathing on legacy device special files, use the `scsimgr` command to configure a global device tunable called `leg_mpath_enable`.

For each multipathed disk, enter the following command:

```
# scsimgr save_attr -D /dev/rdisk/diskn -a leg_mpath_enable=false
```

Alternatively, you can disable multipathing for all legacy device files with this command:

```
# scsimgr save_attr -a leg_mpath_enable=false
```

Note that this has no effect on multipathing through persistent device special files. For more information, see `scsimgr(1M)`.

Moving Volume Groups from HP-UX 11i v3 to Previous HP-UX Releases

If a volume group used on HP-UX 11i v3 is accessed from a system running a previous release of HP-UX 11i, you might encounter these compatibility issues:

- **Version 2.x volume groups:** As noted in “Version 2.1 Volume Groups” (page 9), Version 2.x volume groups are not recognized on previous releases of HP-UX.
- **Logical volumes larger than 2 TB:** Releases prior to HP-UX 11i v3 can only access data within the first 2 TB of a logical volume. If a logical volume larger than 2 TB is created on HP-UX 11i v3, its use is not recommended on any previous HP-UX release. The volume group can be activated and the logical volume can be used, but any data in that logical volume beyond 2 TB will be inaccessible.



NOTE: Patches PHKL_36745, PHCO_36744, and PHCO_37939 resolve this compatibility issue for HP-UX 11i v2. Installing these patches enables the creation and use of logical volumes up to 16 TB.

- **Striped Mirrors:** Releases prior to HP-UX 11i v3 only support extent-based striping via the `-D` option to `lvcreate`. If a logical volume using simultaneous mirroring and non-extent-based striping is created on HP-UX 11i v3, attempts to import or activate its associated volume group will fail on a previous HP-UX release. To import the volume group, you must remove the incompatible logical volumes or reduce them to a single mirror.



NOTE: Patches PHKL_36745, PHCO_36744, and PHCO_37939 resolve this compatibility issue for HP-UX 11i v2. Installing these patches enables the creation and use of striped mirrors.

- **Mirror Write Cache (MWC):** When a volume group containing a logical volume using the Mirror Write Cache is activated on HP-UX 11i v3, its Mirror Write Cache format is converted to a new format. Importing or activating the volume group on a previous HP-UX release does not recognize the new format and triggers a full resynchronization of the mirrors.



NOTE: Patch PHKL_36244 adds support for the new MWC format to HP-UX 11i v2. Installing this patch avoids the unnecessary resynchronization.

As of this writing, larger logical volumes and striped mirrors are only available on HP-UX 11i v3 and HP-UX 11i v2 (with patches). For up-to-the-moment information, contact your Hewlett-Packard support representative or consult the Hewlett-Packard IT Resource Center site: <http://itrc.hp.com> (Americas and Asia Pacific) or <http://europe.itrc.hp.com> (Europe) for LVM patches.

Related Documentation

The latest documentation for LVM is available in English at <http://docs.hp.com> in the *HP-UX Operating Environment* collection. Available documents include:

- *HP-UX Logical Volume Manager and MirrorDisk/UX Release Notes* (this version and previous versions)
- *HP-UX System Administrator's Guide: Logical Volume Management* (this document is localized)
- *LVM 2.0 Volume Groups in HP-UX 11i v3*
- *LVM New Features in HP-UX 11i v3*
- *LVM Limits*
- *LVM Migration from Legacy to Agile Naming Model: HP-UX 11i v3*
- *LVM Online Disk Replacement (LVM OLR)*
- *LVM Volume Group Dynamic LUN expansion (DLE) / vgmodify*
- *LVM Volume Group Quiesce/Resume*
- *SLVM Single-Node Online Reconfiguration (SLVM SNOR)*
- *When Good Disks Go Bad: Dealing with Disk Failures under LVM*

Software Availability in Native Languages

The commands delivered with LVM and MirrorDisk/UX support localized message catalogs. The kernel components which generate messages directly to the console and the system log are available only in the English language.

LVM and MirrorDisk/UX manpages are available in English and Japanese. The *HP-UX System Administrator's Guide: Logical Volume Management* is available in English, French, German, Italian, Japanese, Korean, Spanish, Simplified Chinese, and Traditional Chinese. These documents are on <http://docs.hp.com>.



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