Veritas™ Volume Manager Troubleshooting Guide

HP-UX

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Chapter 1

Recovering from hardware failure

This chapter includes the following topics:

About recovery from hardware failure

Symantec's Veritas Volume Manager (VxVM) protects systems from disk and other hardware failures and helps you to recover from such events. Recovery procedures help you prevent loss of data or system access due to disk and other hardware failures.

If a volume has a disk I/O failure (for example, because the disk has an uncorrectable error), VxVM can detach the plex involved in the failure. I/O stops on that plex but continues on the remaining plexes of the volume.

If a disk fails completely, VxVM can detach the disk from its disk group. All plexes on the disk are disabled. If there are any unmirrored volumes on a disk when it is detached, those volumes are also disabled.

Note: Apparent disk failure may not be due to a fault in the physical disk media or the disk controller, but may instead be caused by a fault in an intermediate or ancillary component such as a cable, host bus adapter, or power supply.

The hot-relocation feature in VxVM automatically detects disk failures, and notifies the system administrator and other nominated users of the failures by electronic mail. Hot-relocation also attempts to use spare disks and free disk space to restore redundancy and to preserve access to mirrored and RAID-5 volumes.

For more information about administering hot-relocation, see the *Veritas Volume Manager Administrator's Guide*.

Recovery from failures of the boot (`root`) disk requires the use of the special procedures.

See "VxVM and boot disk failure" on page 41.

Listing unstartable volumes

An unstartable volume can be incorrectly configured or have other errors or conditions that prevent it from being started. To display unstartable volumes, use the `vxinfo` command. This displays information about the accessibility and usability of volumes

To list unstartable volumes

- Type the following command:

  ```
  # vxinfo [-g diskgroup] [volume ...]
  ```

  The following example output shows one volume, `mkting`, as being unstartable:

  ```
  home         fsgen     Started
  mkting       fsgen     Unstartable
  src          fsgen     Started
  rootvol      root      Started
  swapvol      swap      Started
  ```

Displaying volume and plex states

To display detailed information about the configuration of a volume including its state and the states of its plexes, use the `vxprint` command.

To display volume and plex states

- Type the following command:

  ```
  # vxprint [-g diskgroup] -hvt [volume ...]
  ```

  The following example shows a disabled volume, `vol`, which has two clean plexes, `vol-01` and `vol-02`, each with a single subdisk:

```
# vxprint -g mydg -hvt vol
Disk group: mydg

V   NAME     RVG/VSET/CO  KSTATE     STATE    LENGTH   READPOL    PREFPLEX UTYPE
PL  NAME     VOLUME       KSTATE     STATE    LENGTH   LAYOUT     NCOL/WID MODE
SD  NAME     PLEX         DISK       DISKOFFSLENGTH    [COL/]OFF  DEVICE   MODE
SV  NAME     PLEX         VOLNAME    NVOLLAYRLENGTH    [COL/]OFF  AM/NM    MODE
SC  NAME     PLEX         CACHE      DISKOFFSLENGTH    [COL/]OFF  DEVICE   MODE
DC  NAME     PARENTVOL    LOGVOL
SP  NAME     SNAPVOL      DCO

v   vol        -          DISABLED   ACTIVE   212880   SELECT     -        fsgen
pl  vol-01     vol        DISABLED   CLEAN    212880   CONCAT     -        RW
sd  mydg11-01  vol-01     mydg11     0        212880   0          c1t0d0   ENA
pl  vol-02     vol        DISABLED   CLEAN    212880   CONCAT     -        RW
sd  mydg12-01  vol-02     mydg12     0        212880   0          c1t1d0   ENA
```

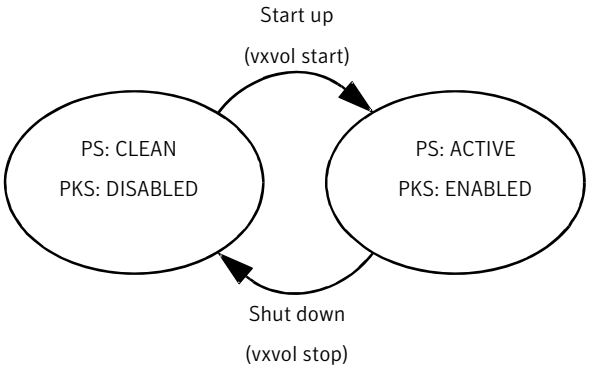
See the *Veritas Volume Manager Administrator's Guide* for a description of the possible plex and volume states.

The plex state cycle

Changing plex states are part of normal operations, and do not necessarily indicate abnormalities that must be corrected. A clear understanding of the various plex states and their interrelationship is necessary if you want to be able to perform any recovery procedures.

Figure 1-1 shows the main transitions that take place between plex states in VxVM.

Figure 1-1 Main plex state cycle



PS = plex state

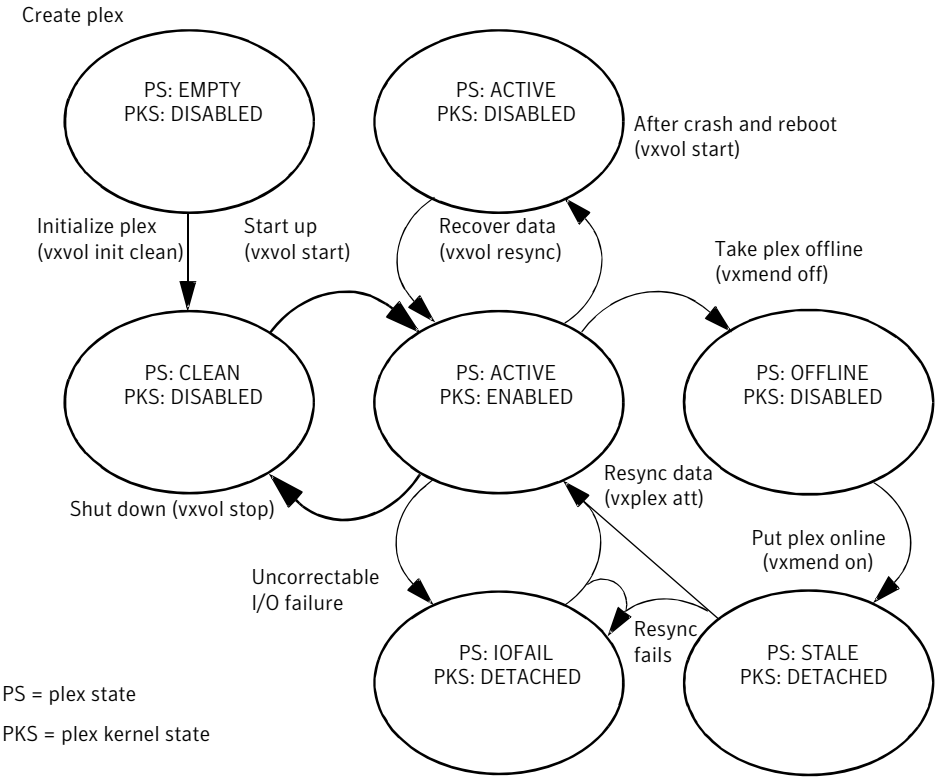
PKS = plex kernel state

For more information about plex states, see the *Veritas Volume Manager Administrator's Guide*.

At system startup, volumes are started automatically and the `vxvol start` task makes all CLEAN plexes ACTIVE. At shutdown, the `vxvol stop` task marks all ACTIVE plexes CLEAN. If all plexes are initially CLEAN at startup, this indicates that a controlled shutdown occurred and optimizes the time taken to start up the volumes.

Figure 1-2 shows additional transitions that are possible between plex states as a result of hardware problems, abnormal system shutdown, and intervention by the system administrator.

Figure 1-2 Additional plex state transitions



When first created, a plex has state EMPTY until the volume to which it is attached is initialized. Its state is then set to CLEAN. Its plex kernel state remains set to DISABLED and is not set to ENABLED until the volume is started.

After a system crash and reboot, all plexes of a volume are ACTIVE but marked with plex kernel state DISABLED until their data is recovered by the `vxvol resync` task.

A plex may be taken offline with the `vxmend off` command, made available again using `vxmend on`, and its data resynchronized with the other plexes when it is reattached using `vxplex att`. A failed resynchronization or uncorrectable I/O failure places the plex in the IOFAIL state.

There are various actions that you can take if a system crash or I/O error leaves no plexes of a mirrored volume in a CLEAN or ACTIVE state.

See "Recovering an unstartable mirrored volume" on page 14.

See "Failures on RAID-5 volumes" on page 18.

Recovering an unstartable mirrored volume

A system crash or an I/O error can corrupt one or more plexes of a mirrored volume and leave no plex CLEAN or ACTIVE. You can mark one of the plexes CLEAN and instruct the system to use that plex as the source for reviving the others.

To recover an unstartable mirrored volume

1. Place the desired plex in the CLEAN state using the following command:

   ```
   # vxmend [-g diskgroup] fix clean plex
   ```

   For example, to place the plex vol01-02 in the CLEAN state:

   ```
   # vxmend -g mydg fix clean vol01-02
   ```

2. To recover the other plexes in a volume from the CLEAN plex, the volume must be disabled, and the other plexes must be STALE. If necessary, make any other CLEAN or ACTIVE plexes STALE by running the following command on each of these plexes in turn:

   ```
   # vxmend [-g diskgroup] fix stale plex
   ```

   Following severe hardware failure of several disks or other related subsystems underlying all the mirrored plexes of a volume, it may be impossible to recover the volume using vxmend. In this case, remove the volume, recreate it on hardware that is functioning correctly, and restore the contents of the volume from a backup or from a snapshot image.

   See the vxmend(1M) manual page.

3. To enable the CLEAN plex and to recover the STALE plexes from it, use the following command:

   ```
   # vxvol [-g diskgroup] start volume
   ```

   For example, to recover volume vol01:

   ```
   # vxvol -g mydg start vol01
   ```

   See the vxvol(1M) manual page.

Recovering an unstartable volume with a disabled plex in the RECOVER state

A plex is shown in the RECOVER state if its contents are out-of-date with respect to the volume. This can happen if a disk containing one or more of the plex's subdisks has been replaced or reattached. If a plex is shown as being in this state, it can be recovered by using the `vxmend` and `vxvol` commands.

To recover an unstartable volume with a disabled plex in the RECOVER state

1. Use the following command to force the plex into the OFFLINE state:

   ```
   # vxmend [-g diskgroup] -o force off plex
   ```

2. Place the plex into the STALE state using this command:

   ```
   # vxmend [-g diskgroup] on plex
   ```

3. If there are other ACTIVE or CLEAN plexes in the volume, use the following command to reattach the plex to the volume:

   ```
   # vxplex [-g diskgroup] att plex volume
   ```

   If the volume is already enabled, resynchronization of the plex is started immediately.

   If there are no other clean plexes in the volume, use this command to make the plex DISABLED and CLEAN:

   ```
   # vxmend [-g diskgroup] fix clean plex
   ```

4. If the volume is not already enabled, use the following command to start it, and preform any resynchronization of the plexes in the background:

   ```
   # vxvol [-g diskgroup] -o bg start volume
   ```

   If the data in the plex was corrupted, and the volume has no ACTIVE or CLEAN redundant plexes from which its contents can be resynchronized, it must be restored from a backup or from a snapshot image.

Forcibly restarting a disabled volume

If a disk failure caused a volume to be disabled, and the volume does not contain any valid redundant plexes, you must restore the volume from a backup after

replacing the failed disk. Any volumes that are listed as `Unstartable` must be restarted using the `vxvol` command before restoring their contents from a backup.

To forcibly restart a disabled volume

- Type the following command:

  ```
  # vxvol [-g diskgroup] -o bg -f start volume
  ```

  The `-f` option forcibly restarts the volume, and the `-o bg` option resynchronizes its plexes as a background task. For example, to restart the volume `myvol` so that it can be restored from backup, use the following command:

  ```
  # vxvol -g mydg -o bg -f start myvol
  ```

Clearing the failing flag on a disk

If I/O errors are intermittent rather than persistent, Veritas Volume Manager sets the `failing` flag on a disk, rather than detaching the disk. Such errors can occur due to the temporary removal of a cable, controller faults, a partially faulty LUN in a disk array, or a disk with a few bad sectors or tracks.

If the hardware fault is not with the disk itself (for example, it is caused by problems with the controller or the cable path to the disk), you can use the `vxedit` command to unset the `failing` flag after correcting the source of the I/O error.

Warning: Do not unset the `failing` flag if the reason for the I/O errors is unknown. If the disk hardware truly is failing, and the flag is cleared, there is a risk of data loss.

To clear the failing flag on a disk

1 Use the `vxdisk list` command to find out which disks are failing:

```
# vxdisk list
DEVICE       TYPE            DISK      GROUP     STATUS
c1t1d0       auto:simple     mydg01    mydg      online
c1t1d0       auto:simple     mydg02    mydg      online failing
c1t1d0       auto:simple     mydg03    mydg      online
. . .
```

2 Use the `vxedit set` command to clear the flag for each disk that is marked as `failing` (in this example, `mydg02`):

```
# vxedit set failing=off mydg02
```

3 Use the `vxdisk list` command to verify that the `failing` flag has been cleared:

```
# vxdisk list
DEVICE       TYPE            DISK      GROUP     STATUS
c1t1d0       auto:simple     mydg01    mydg      online
c1t2d0       auto:simple     mydg02    mydg      online
c1t3d0       auto:simple     mydg03    mydg      online
. . .
```

Reattaching failed disks

You can perform a reattach operation if a disk could not be found at system startup, or if VxVM is started with some disk drivers unloaded and unloadable (causing disks to enter the `failed` state). If the underlying problem has been fixed (such as a cable or controller fault), use the `vxreattach` command to reattach the disks without plexes being flagged as STALE. However, the reattach must occur before any volumes on the disk are started.

The `vxreattach` command is called as part of disk recovery from the `vxdiskadm` menus and during the boot process. If possible, `vxreattach` reattaches the failed disk media record to the disk with the same device name. Reattachment places a disk in the same disk group that it was located in before and retains its original disk media name.

To reattach a failed disk

1. Use the `vxdisk list` command to see which disks have failed, as shown in the following example:

```
# vxdisk list
   DEVICE       TYPE           DISK      GROUP     STATUS
   c1t1d0       auto:simple    mydg01    mydg      online
   c1t2d0       auto:simple    mydg02    mydg      online
   -            -              mydg03    mydg      failed was: c1t3d0
   -            -              mydg04    mydg      failed was: c1t4d0
```

2. Once the fault has been corrected, the disks can be reattached by using the following command to rescan the device list:

```
# /usr/sbin/vxdctl enable
```

3. Use the `vxreattach` command with no options to reattach the disks:

```
# /etc/vx/bin/vxreattach
```

   After reattachment takes place, recovery may not be necessary unless a disk was faulty and had to be replaced. Reattachment can fail if the original (or another) cause for the disk failure still exists.

   You can use the command `vxreattach -c` to check whether reattachment is possible, without performing the operation. Instead, it displays the disk group and disk media name where the disk can be reattached.

   See the `vxreattach`(1M) manual page.

Failures on RAID-5 volumes

Failures are seen in two varieties: system failures and disk failures. A system failure means that the system has abruptly ceased to operate due to an operating system panic or power failure. Disk failures imply that the data on some number of disks has become unavailable due to a system failure (such as a head crash, electronics failure on disk, or disk controller failure).

System failures

RAID-5 volumes are designed to remain available with a minimum of disk space overhead, if there are disk failures. However, many forms of RAID-5 can have data loss after a system failure. Data loss occurs because a system failure causes the data and parity in the RAID-5 volume to become unsynchronized. Loss of

synchronization occurs because the status of writes that were outstanding at the time of the failure cannot be determined.

If a loss of sync occurs while a RAID-5 volume is being accessed, the volume is described as having stale parity. The parity must then be reconstructed by reading all the non-parity columns within each stripe, recalculating the parity, and writing out the parity stripe unit in the stripe. This must be done for every stripe in the volume, so it can take a long time to complete.

Warning: While the resynchronization of a RAID-5 volume without log plexes is being performed, any failure of a disk within the volume causes its data to be lost.

Besides the vulnerability to failure, the resynchronization process can tax the system resources and slow down system operation.

RAID-5 logs reduce the damage that can be caused by system failures, because they maintain a copy of the data being written at the time of the failure. The process of resynchronization consists of reading that data and parity from the logs and writing it to the appropriate areas of the RAID-5 volume. This greatly reduces the amount of time needed for a resynchronization of data and parity. It also means that the volume never becomes truly stale. The data and parity for all stripes in the volume are known at all times, so the failure of a single disk cannot result in the loss of the data within the volume.

Disk failures

An uncorrectable I/O error occurs when disk failure, cabling or other problems cause the data on a disk to become unavailable. For a RAID-5 volume, this means that a subdisk becomes unavailable. The subdisk cannot be used to hold data and is considered stale and detached. If the underlying disk becomes available or is replaced, the subdisk is still considered stale and is not used.

If an attempt is made to read data contained on a stale subdisk, the data is reconstructed from data on all other stripe units in the stripe. This operation is called a reconstructing-read. This is a more expensive operation than simply reading the data and can result in degraded read performance. When a RAID-5 volume has stale subdisks, it is considered to be in degraded mode.

A RAID-5 volume in degraded mode can be recognized from the output of the `vxprint -ht` command as shown in the following display:

```
V   NAME        RVG/VSET/COKSTATE STATE    LENGTH   READPOL    PREFPLEX   UTYPE
PL  NAME        VOLUME   KSTATE   STATE    LENGTH   LAYOUT     NCOL/WID   MODE
SD  NAME        PLEX     DISK     DISKOFFS LENGTH   [COL/]OFF  DEVICE     MODE
SV  NAME        PLEX     VOLNAME  NVOLLAYR LENGTH   [COL/]OFF  AM/NM      MODE
```

```
...
v   r5vol      -         ENABLED  DEGRADED 204800   RAID       -          raid5
pl  r5vol-01   r5vol     ENABLED  ACTIVE   204800   RAID       3/16       RW
sd  disk01-01  r5vol-01disk01    0        102400   0/0        c2t9d0     ENA
sd  disk02-01  r5vol-01disk02    0        102400   1/0        c2t10d0    dS
sd  disk03-01  r5vol-01disk03    0        102400   2/0        c2t11d0    ENA
pl  r5vol-02   r5vol     ENABLED  LOG      1440     CONCAT     -          RW
sd  disk04-01  r5vol-02disk04    0        1440     0          c2t12d0    ENA
pl  r5vol-03   r5vol     ENABLED  LOG      1440     CONCAT     -          RW
sd  disk05-01  r5vol-03disk05    0        1440     0          c2t14d0    ENA
```

The volume `r5vol` is in degraded mode, as shown by the volume state, which is listed as `DEGRADED`. The failed subdisk is `disk02-01`, as shown by the `MODE` flags; `d` indicates that the subdisk is detached, and `S` indicates that the subdisk's contents are stale.

Warning: Do not run the `vxr5check` command on a RAID-5 volume that is in degraded mode.

A disk containing a RAID-5 log plex can also fail. The failure of a single RAID-5 log plex has no direct effect on the operation of a volume provided that the RAID-5 log is mirrored. However, loss of all RAID-5 log plexes in a volume makes it vulnerable to a complete failure. In the output of the `vxprint -ht` command, failure within a RAID-5 log plex is indicated by the plex state being shown as `BADLOG` rather than `LOG`.

In the following example, the RAID-5 log plex `r5vol-02` has failed:

```
V   NAME        RVG/VSET/COKSTATE    STATE     LENGTH     READPOL      PREFPLEX     UTYPE
PL  NAME        VOLUME    KSTATE     STATE     LENGTH     LAYOUT       NCOL/WID     MODE
SD  NAME        PLEX      DISK       DISKOFFS  LENGTH     [COL/]OFF    DEVICE       MODE
SV  NAME        PLEX      VOLNAME    NVOLLAYR  LENGTH     [COL/]OFF    AM/NM        MODE
...
v   r5vol       -         ENABLED    ACTIVE    204800     RAID         -            raid5
pl  r5vol-01    r5vol     ENABLED    ACTIVE    204800     RAID         3/16         RW
sd  disk01-01   r5vol-01disk01       0         102400     0/0          c2t9d0       ENA
sd  disk02-01   r5vol-01disk02       0         102400     1/0          c2t10d0      ENA
sd  disk03-01   r5vol-01disk03       0         102400     2/0          c2t11d0      ENA
pl  r5vol-02    r5vol     DISABLED   BADLOG    1440       CONCAT       -            RW
sd  disk04-01   r5vol-02disk04       0         1440       0            c2t12d0      ENA
pl  r5vol-03    r5vol     ENABLED    LOG       1440       CONCAT       -            RW
sd  disk05-01   r5vol-12disk05       0         1440       0            c2t14d0      ENA
```

Default startup recovery process for RAID-5

VxVM may need to perform several operations to restore fully the contents of a RAID-5 volume and make it usable. Whenever a volume is started, any RAID-5 log plexes are zeroed before the volume is started. This prevents random data from being interpreted as a log entry and corrupting the volume contents. Also, some subdisks may need to be recovered, or the parity may need to be resynchronized (if RAID-5 logs have failed).

VxVM takes the following steps when a RAID-5 volume is started:

- If the RAID-5 volume was not cleanly shut down, it is checked for valid RAID-5 log plexes.
- If valid log plexes exist, they are replayed. This is done by placing the volume in the `DETACHED` volume kernel state and setting the volume state to `REPLAY`, and enabling the RAID-5 log plexes.
- If no valid logs exist, the parity must be resynchronized. Resynchronization is done by placing the volume in the `DETACHED` volume kernel state and setting the volume state to SYNC. Any log plexes are left in the `DISABLED` plex kernel state.

  The volume is not made available while the parity is resynchronized because any subdisk failures during this period makes the volume unusable. This can be overridden by using the `-o unsafe` start option with the `vxvol` command. If any stale subdisks exist, the RAID-5 volume is unusable.

  Warning: The `-o unsafe` start option is considered dangerous, as it can make the contents of the volume unusable. Using it is not recommended.

- Any existing log plexes are zeroed and enabled. If all logs fail during this process, the start process is aborted.
- If no stale subdisks exist or those that exist are recoverable, the volume is put in the `ENABLED` volume kernel state and the volume state is set to `ACTIVE`. The volume is now started.

Recovery of RAID-5 volumes

The following types of recovery may be required for RAID-5 volumes:

- Resynchronization of parity
- Reattachment of a failed RAID-5 log plex
- Recovery of a stale subdisk

Parity resynchronization and stale subdisk recovery are typically performed when the RAID-5 volume is started, or shortly after the system boots. They can also be performed by running the `vxrecover` command.

See "Unstartable RAID-5 volumes" on page 25.

If hot-relocation is enabled at the time of a disk failure, system administrator intervention is not required unless no suitable disk space is available for relocation. Hot-relocation is triggered by the failure and the system administrator is notified of the failure by electronic mail.

Hot relocation automatically attempts to relocate the subdisks of a failing RAID-5 plex. After any relocation takes place, the hot-relocation daemon (`vxrelocd`) also initiates a parity resynchronization.

In the case of a failing RAID-5 log plex, relocation occurs only if the log plex is mirrored; the `vxrelocd` daemon then initiates a mirror resynchronization to recreate the RAID-5 log plex. If hot-relocation is disabled at the time of a failure, the system administrator may need to initiate a resynchronization or recovery.

Note: Following severe hardware failure of several disks or other related subsystems underlying a RAID-5 plex, it may be only be possible to recover the volume by removing the volume, recreating it on hardware that is functioning correctly, and restoring the contents of the volume from a backup.

Resynchronizing parity on a RAID-5 volume

In most cases, a RAID-5 array does not have stale parity. Stale parity only occurs after all RAID-5 log plexes for the RAID-5 volume have failed, and then only if there is a system failure. Even if a RAID-5 volume has stale parity, it is usually repaired as part of the volume start process.

If a volume without valid RAID-5 logs is started and the process is killed before the volume is resynchronized, the result is an active volume with stale parity.

The following example is output from the `vxprint -ht` command for a stale RAID-5 volume:

```
V   NAME         RVG/VSET/COKSTATE     STATE     LENGTH     READPOL     PREFPLEX    UTYPE
PL  NAME         VOLUME      KSTATE    STATE     LENGTH     LAYOUT      NCOL/WID    MODE
SD  NAME         PLEX        DISK      DISKOFFS  LENGTH     [COL/]OFF   DEVICE      MODE
SV  NAME         PLEX        VOLNAME   NVOLLAYR  LENGTH     [COL/]OFF   AM/NM       MODE
...
v   r5vol        -           ENABLED   NEEDSYNC  204800     RAID        -           raid5
pl  r5vol-01     r5vol       ENABLED   ACTIVE    204800     RAID        3/16        RW
sd  disk01-01    r5vol-01    disk01    0         102400     0/0         c2t9d0      ENA
```

```
sd  disk02-01  r5vol-01   disk02     0          102400     1/0          c2t10d0     dS
sd  disk03-01  r5vol-01   disk03     0          102400     2/0          c2t11d0     ENA
...
```

This output lists the volume state as NEEDSYNC, indicating that the parity needs to be resynchronized. The state could also have been SYNC, indicating that a synchronization was attempted at start time and that a synchronization process should be doing the synchronization. If no such process exists or if the volume is in the NEEDSYNC state, a synchronization can be manually started by using the resync keyword for the vxvol command.

Parity is regenerated by issuing VOL_R5_RESYNC ioctls to the RAID-5 volume. The resynchronization process starts at the beginning of the RAID-5 volume and resynchronizes a region equal to the number of sectors specified by the *-o iosize* option. If the *-o iosize* option is not specified, the default maximum I/O size is used. The resync operation then moves onto the next region until the entire length of the RAID-5 volume has been resynchronized.

For larger volumes, parity regeneration can take a long time. It is possible that the system could be shut down or crash before the operation is completed. In case of a system shutdown, the progress of parity regeneration must be kept across reboots. Otherwise, the process has to start all over again.

To avoid the restart process, parity regeneration is checkpointed. This means that the offset up to which the parity has been regenerated is saved in the configuration database. The *-o checkpt=size* option controls how often the checkpoint is saved. If the option is not specified, the default checkpoint size is used.

Because saving the checkpoint offset requires a transaction, making the checkpoint size too small can extend the time required to regenerate parity. After a system reboot, a RAID-5 volume that has a checkpoint offset smaller than the volume length starts a parity resynchronization at the checkpoint offset.

To resynchronize parity on a RAID-5 volume

- Type the following command:

  # vxvol -g *diskgroup* **resync** *r5vol*

Reattaching a failed RAID-5 log plex

RAID-5 log plexes can become detached due to disk failures. These RAID-5 logs can be reattached by using the att keyword for the vxplex command.

To reattach a failed RAID-5 log plex

- Type the following command:

```
# vxplex -g diskgroup att r5vol r5vol-plex
```

Recovering a stale subdisk in a RAID-5 volume

Stale subdisk recovery is usually done at volume start time. However, the process doing the recovery can crash, or the volume may be started with an option such as `-o delayrecover` that prevents subdisk recovery. In addition, the disk on which the subdisk resides can be replaced without recovery operations being performed. In such cases, you can perform subdisk recovery by using the `vxvol recover` command.

To recover a stale subdisk in the RAID-5 volume

- Type the following command:

```
# vxvol -g diskgroup recover r5vol subdisk
```

A RAID-5 volume that has multiple stale subdisks can be recovered in one operation. To recover multiple stale subdisks, use the `vxvol recover` command on the volume:

```
# vxvol -g diskgroup recover r5vol
```

Recovery after moving RAID-5 subdisks

When RAID-5 subdisks are moved and replaced, the new subdisks are marked as `STALE` in anticipation of recovery. If the volume is active, the `vxsd` command may be used to recover the volume. If the volume is not active, it is recovered when it is next started. The RAID-5 volume is degraded for the duration of the recovery operation.

Any failure in the stripes involved in the move makes the volume unusable. The RAID-5 volume can also become invalid if its parity becomes stale.

To avoid a volume becoming unusable, the `vxsd` command does not allow a subdisk move in the following situations:

- A stale subdisk occupies any of the same stripes as the subdisk being moved.

- The RAID-5 volume is stopped but was not shut down cleanly; that is, the parity is considered stale.
- The RAID-5 volume is active and has no valid log areas.

Only the third case can be overridden by using the `-o force` option.

Subdisks of RAID-5 volumes can also be split and joined by using the `vxsd split` command and the `vxsd join` command. These operations work the same way as those for mirrored volumes.

RAID-5 subdisk moves are performed in the same way as subdisk moves for other volume types, but without the penalty of degraded redundancy.

Unstartable RAID-5 volumes

When a RAID-5 volume is started, it can be in one of many states. After a normal system shutdown, the volume should be clean and require no recovery. However, if the volume was not closed, or was not unmounted before a crash, it can require recovery when it is started, before it can be made available.

Under normal conditions, volumes are started automatically after a reboot and any recovery takes place automatically or is done through the `vxrecover` command.

A RAID-5 volume is unusable if some part of the RAID-5 plex does not map the volume length in the following circumstances:

- The RAID-5 plex is sparse in relation to the RAID-5 volume length.
- The RAID-5 plex does not map a region where two subdisks have failed within a stripe, either because they are stale or because they are built on a failed disk.

When this occurs, the `vxvol start` command returns the following error message:

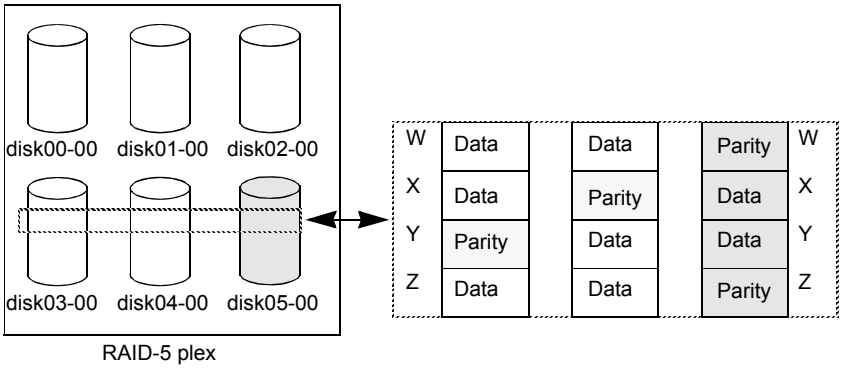
```
VxVM vxvol ERROR V-5-1-1236 Volume r5vol is not startable; RAID-5 plex
does not map entire volume length.
```

At this point, the contents of the RAID-5 volume are unusable.

Another possible way that a RAID-5 volume can become unstartable is if the parity is stale and a subdisk becomes detached or stale. This occurs because within the stripes that contain the failed subdisk, the parity stripe unit is invalid (because the parity is stale) and the stripe unit on the bad subdisk is also invalid.

Figure 1-3 illustrates a RAID-5 volume that has become invalid due to stale parity and a failed subdisk.

Figure 1-3 Invalid RAID-5 volume



There are four stripes in the RAID-5 array. All parity is stale and subdisk `disk05-00` has failed. This makes stripes X and Y unusable because two failures have occurred within those stripes.

This qualifies as two failures within a stripe and prevents the use of the volume. In this case, the output display from the `vxvol start` command is as follows:

```
VxVM vxvol ERROR V-5-1-1237 Volume r5vol is not startable;
some subdisks are unusable and the parity is stale.
```

This situation can be avoided by always using two or more RAID-5 log plexes in RAID-5 volumes. RAID-5 log plexes prevent the parity within the volume from becoming stale which prevents this situation.

See "System failures" on page 18.

Forcibly starting a RAID-5 volume with stale subdisks

You can start a volume even if subdisks are marked as stale: for example, if a stopped volume has stale parity and no RAID-5 logs, and a disk becomes detached and then reattached.

The subdisk is considered stale even though the data is not out of date (because the volume was in use when the subdisk was unavailable) and the RAID-5 volume is considered invalid. To prevent this case, always have multiple valid RAID-5 logs associated with the array whenever possible.

To forcibly start a RAID-5 volume with stale subdisks

- Specify the `-f` option to the `vxvol start` command.

  ```
  # vxvol [-g diskgroup] -f start r5vol
  ```

  This causes all stale subdisks to be marked as non-stale. Marking takes place before the `start` operation evaluates the validity of the RAID-5 volume and what is needed to start it. You can mark individual subdisks as non-stale by using the following command:

  ```
  # vxmend [-g diskgroup] fix unstale subdisk
  ```

  If some subdisks are stale and need recovery, and if valid logs exist, the volume is enabled by placing it in the `ENABLED` kernel state and the volume is available for use during the subdisk recovery. Otherwise, the volume kernel state is set to `DETACHED` and it is not available during subdisk recovery. This is done because if the system were to crash or if the volume were ungracefully stopped while it was active, the parity becomes stale, making the volume unusable. If this is undesirable, the volume can be started with the `-o unsafe start` option.

  Warning: The `-o unsafe start` option is considered dangerous, as it can make the contents of the volume unusable. It is therefore not recommended.

  The volume state is set to `RECOVER`, and stale subdisks are restored. As the data on each subdisk becomes valid, the subdisk is marked as no longer stale. If the recovery of any subdisk fails, and if there are no valid logs, the volume start is aborted because the subdisk remains stale and a system crash makes the RAID-5 volume unusable. This can also be overridden by using the `-o unsafe start` option.

  If the volume has valid logs, subdisk recovery failures are noted but they do not stop the start procedure.

  When all subdisks have been recovered, the volume is placed in the `ENABLED` kernel state and marked as `ACTIVE`.

Recovering from an incomplete disk group move

If the system crashes or a subsystem fails while a disk group move, split or join operation is being performed, VxVM attempts either to reverse or to complete

the operation when the system is restarted or the subsystem is repaired. Whether the operation is reversed or completed depends on how far it had progressed.

Automatic recovery depends on being able to import both the source and target disk groups. However, automatic recovery may not be possible if, for example, one of the disk groups has been imported on another host.

To recover from an incomplete disk group move

1. Use the `vxprint` command to examine the configuration of both disk groups. Objects in disk groups whose move is incomplete have their TUTIL0 fields set to MOVE.
2. Enter the following command to attempt completion of the move:

   ```
   # vxdg recover sourcedg
   ```

   This operation fails if one of the disk groups cannot be imported because it has been imported on another host or because it does not exist:

   ```
   VxVM vxdg ERROR V-5-1-2907 diskgroup: Disk group does not exist
   ```

   If the recovery fails, perform one of the following steps as appropriate.
3. If the disk group has been imported on another host, export it from that host, and import it on the current host. If all the required objects already exist in either the source or target disk group, use the following command to reset the MOVE flags in that disk group:

   ```
   # vxdg -o clean recover diskgroup1
   ```

   Use the following command on the other disk group to remove the objects that have TUTIL0 fields marked as MOVE:

   ```
   # vxdg -o remove recover diskgroup2
   ```

4. If only one disk group is available to be imported, use the following command to reset the MOVE flags on this disk group:

   ```
   # vxdg -o clean recover diskgroup
   ```

Recovery from failure of a DCO volume

The procedure to recover from the failure of a data change object (DCO) volume depends on the DCO version number.

For information about DCO versioning, see the *Veritas Volume Manager Administrator's Guide*.

Persistent FastResync uses a DCO volume to perform tracking of changed regions in a volume. If an error occurs while reading or writing a DCO volume, it is detached and the `badlog` flag is set on the DCO. All further writes to the volume are not tracked by the DCO.

The following sample output from the `vxprint` command shows a complete volume with a detached DCO volume (the `TUTIL0` and `PUTIL0` fields are omitted for clarity):

```
TY NAME             ASSOC          KSTATE        LENGTH      PLOFFS     STATE ...
dg mydg             mydg           -             -           -          -
dm mydg01           c4t50d0        -             35521408    -          -
dm mydg02           c4t51d0        -             35521408    -          -
dm mydg03           c4t52d0        -             35521408    -          FAILING
dm mydg04           c4t53d0        -             35521408    -          FAILING
dm mydg05           c4t54d0        -             35521408    -          -

v  SNAP-vol1        fsgen          ENABLED       204800      -          ACTIVE
pl vol1-03          SNAP-vol1      ENABLED       204800      -          ACTIVE
sd mydg05-01        vol1-03        ENABLED       204800      0          -
dc SNAP-vol1_dco    SNAP-vol1      -             -           -          -
v  SNAP-vol1_dcl    gen            ENABLED       144         -          ACTIVE
pl vol1_dcl-03      SNAP-vol1_dcl  ENABLED       144         -          ACTIVE
sd mydg05-02        vol1_dcl-03    ENABLED       144         0          -
sp vol1_snp         SNAP-vol1      -             -           -          -

v  vol1             fsgen          ENABLED       204800      -          ACTIVE
pl vol1-01          vol1           ENABLED       204800      -          ACTIVE
sd mydg01-01        vol1-01        ENABLED       204800      0          -
pl vol1-02          vol1           ENABLED       204800      -          ACTIVE
sd mydg02-01        vol1-01        ENABLED       204800      0          -
dc vol1_dco         vol1           -             -           -          BADLOG
v  vol1_dcl         gen            DETACHED      144         -          DETACH
pl vol1_dcl-01      vol1_dcl       ENABLED       144         -          ACTIVE
sd mydg03-01        vol1_dcl-01    ENABLED       144         0          -
pl vol1_dcl-02      vol1_dcl       DETACHED      144         -          IOFAIL
sd mydg04-01        vol1_dcl-02    ENABLED       144         0          RELOCATE
sp SNAP-vol1_snp    vol1           -             -           -          -
```

This output shows the mirrored volume, `vol1`, its snapshot volume, `SNAP-vol1`, and their respective DCOs, `vol1_dco` and `SNAP-vol1_dco`. The two disks, `mydg03` and `mydg04`, that hold the DCO plexes for the DCO volume, `vol1_dcl`, of `vol1` have failed. As a result, the DCO volume, `vol1_dcl`, of the volume, `vol1`, has been detached and the state of `vol1_dco` has been set to `BADLOG`. For future reference,

note the entries for the snap objects, `vol1_snp` and `SNAP-vol1_snp`, that point to `vol1` and `SNAP-vol1` respectively.

You can use such output to deduce the name of a volume's DCO (in this example, `vol1_dco`), or you can use the following `vxprint` command to display the name of a volume's DCO:

```
# vxprint [-g diskgroup] -F%dco_name volume
```

You can use the `vxprint` command to check if the `badlog` flag is set for the DCO of a volume as shown here:

```
# vxprint [-g diskgroup] -F%badlog dco_name
```

This command returns the value `on` if the `badlog` flag is set. For the example output, the command would take this form:

```
# vxprint -g mydg -F%badlog vol1_dco
on
```

Use the following command to verify the version number of the DCO:

```
# vxprint [-g diskgroup] -F%version dco_name
```

This returns a value of 0 or 20. For the example output, the command would take this form:

```
# vxprint -g mydg -F%version vol1_dco
```

The DCO version number determines the recovery procedure that you should use.

See "Recovering a version 0 DCO volume" on page 31.

See "Recovering a version 20 DCO volume" on page 33.

Recovering a version 0 DCO volume

To recover a version 0 DCO volume

1. Correct the problem that caused the I/O failure.
2. Use the following command to remove the `badlog` flag from the DCO:

   ```
   # vxdco [-g diskgroup] -o force enable dco_name
   ```

   For the example output, the command would take this form:

   ```
   # vxdco -g mydg -o force enable vol1_dco
   ```

   The entry for `vol1_dco` in the output from `vxprint` now looks like this:

   ```
   dc vol1_dco        vol1     -    -   -  -
   ```

3. Restart the DCO volume using the following command:

   ```
   # vxvol [-g diskgroup] start dco_log_vol
   ```

   For the example output, the command would take this form:

   ```
   # vxvol -g mydg start vol1_dcl
   ```

4 Use the `vxassist snapclear` command to clear the FastResync maps for the original volume and for all its snapshots. This ensures that potentially stale FastResync maps are not used when the snapshots are snapped back (a full resynchronization is performed). FastResync tracking is re-enabled for any subsequent snapshots of the volume.

Warning: You must use the `vxassist snapclear` command on all the snapshots of the volume after removing the `badlog` flag from the DCO. Otherwise, data may be lost or corrupted when the snapshots are snapped back.

If a volume and its snapshot volume are in the same disk group, the following command clears the FastResync maps for both volumes:

```
# vxassist [-g diskgroup] snapclear volume \
  snap_obj_to_snapshot
```

Here *snap_obj_to_snapshot* is the name of the snap object associated with *volume* that points to the snapshot volume.

For the example output, the command would take this form:

```
# vxassist -g mydg snapclear vol1 SNAP-vol1_snp
```

If a snapshot volume and the original volume are in different disk groups, you must perform a separate `snapclear` operation on each volume:

```
# vxassist -g diskgroup1 snapclear volume snap_obj_to_snapshot
# vxassist -g diskgroup2 snapclear snapvol snap_obj_to_volume
```

Here *snap_obj_to_volume* is the name of the snap object associated with the snapshot volume, *snapvol*, that points to the original volume.

For the example output, the commands would take this form if `SNAP-vol1` had been moved to the disk group, `snapdg`:

```
# vxassist -g mydg snapclear vol1 SNAP-vol1_snp
# vxassist -g snapdg snapclear SNAP-vol1 vol1_snp
```

5 To snap back the snapshot volume on which you performed a `snapclear`, use the following command (after using the `vxdg move` command to move the snapshot plex back to the original disk group, if necessary):

```
# vxplex -f [-g diskgroup] snapback volume snapvol_plex
```

For the example output, the command would take this form:

```
# vxplex -f -g mydg snapback vol1 vol1-03
```

You cannot use the `vxassist snapback` command because the `snapclear` operation removes the snapshot association information.

Recovering a version 20 DCO volume

To recover a version 20 DCO volume

1 Correct the problem that caused the I/O failure.

2 Use the `vxsnap` command to dissociate each full-sized instant snapshot volume that is associated with the volume:

```
# vxsnap [-g diskgroup] dis snapvol
```

For the example output, the command would take this form:

```
# vxsnap -g mydg dis SNAP-vol1
```

3 Unprepare the volume using the following command:

```
# vxsnap [-g diskgroup] unprepare volume
```

For the example output, the command would take this form:

```
# vxsnap -g mydg unprepare vol1
```

4 Start the volume using the `vxvol` command:

```
# vxvol [-g diskgroup] start volume
```

For the example output, the command would take this form:

```
# vxvol -g mydg start vol1
```

5 Prepare the volume again using the following command:

```
# vxsnap [-g diskgroup] prepare volume [ndcomirs=number] \
     [regionsize=size] [drl=yes|no|sequential] \
     [storage_attribute ...]
```

For the example output, the command might take this form:

```
# vxsnap -g mydg prepare vol1 ndcomirs=2 drl=yes
```

This adds a DCO volume with 2 plexes, and also enables DRL and FastResync (if licensed).

For full details of how to use the `vxsnap prepare` command, see the *Veritas Volume Manager Administrator's Guide* and the `vxsnap`(1M) manual page.

Chapter 2

Recovering from instant snapshot failure

This chapter includes the following topics:

Recovering from the failure of vxsnap prepare

If a `vxsnap prepare` operation fails prematurely, the `vxprint` command may show the new DCO volume in the INSTSNAPTMP state. VxVM can usually recover the DCO volume without intervention. However, in certain situations, this recovery may not succeed. If this happens, the DCO volume must be deleted.

To recover from the failure of the vxsnap prepare command

- Type the following command:

  ```
  # vxedit [-g diskgroup] rm DCO_volume
  ```

  Alternatively, the DCO volume is removed automatically when the system is next restarted. When the DCO volume has been removed, run the `vxsnap prepare` command again.

Recovering from the failure of vxsnap make for full-sized instant snapshots

If a `vxsnap make` operation fails during the creation of a full-sized instant snapshot, the snapshot volume may go into the DISABLED state, be marked invalid and be rendered unstartable. You can use the following command to check that the `inst_invalid` flag is set to `on`:

```
# vxprint [-g diskgroup] -F%inst_invalid snapshot_volume
```

VxVM can usually recover the snapshot volume without intervention. However, in certain situations, this recovery may not succeed. If this happens, the DCO volume must be deleted.

To recover from the failure of the vxsnap make command for full-sized instant snapshots

1. Use the `vxmend` command to clear the snapshot volume's `tutil0` field:

   ```
   # vxmend [-g diskgroup] clear tutil0 snapshot_volume
   ```

2. Run the following command on the snapshot volume:

   ```
   # vxsnap [-g diskgroup] unprepare snapshot_volume
   ```

3. Prepare the snapshot volume again for snapshot operations:

   ```
   # vxsnap [-g diskgroup] prepare snapshot_volume
   ```

Recovering from the failure of vxsnap make for break-off instant snapshots

If a `vxsnap make` operation fails during the creation of a third-mirror break-off instant snapshot, the snapshot volume may go into the INSTSNAPTMP state. VxVM can usually recover the snapshot volume without intervention. However, in certain situations, this recovery may not succeed. If this happens, the snapshot volume must be deleted.

To recover from the failure of the vxsnap make command for break-off instant snapshots

- Type the following command:

  ```
  # vxedit [-g diskgroup] rm snapshot_volume
  ```

  Alternatively, the snapshot volume is removed automatically when the system is next restarted.

Recovering from the failure of vxsnap make for space-optimized instant snapshots

If a `vxsnap make` operation fails during the creation of a space-optimized instant snapshot, the snapshot volume may go into the INSTSNAPTMP state. VxVM can usually recover the snapshot volume without intervention. However, in certain situations, this recovery may not succeed. If this happens, the snapshot volume must be deleted.

To recover from the failure of the vxsnap make command for space-optimized instant snapshots

- Type the following command:

  ```
  # vxedit [-g diskgroup] rm snapshot_volume
  ```

  Alternatively, the snapshot volume is removed automatically when the system is next restarted.

  If the `vxsnap make` operation was being performed on a prepared cache object by specifying the `cache` attribute, the cache object remains intact after deleting the snapshot. If the `cachesize` attribute was used to specify a new cache object, the cache object does not exist after deleting the snapshot.

Recovering from the failure of vxsnap restore

If a `vxsnap restore` operation fails, the volume being restored may go into the DISABLED state.

To recover from the failure of the vxsnap restore command

- Type the following command:

  # vxvol [-g *diskgroup*] **start** *volume*

Recovering from the failure of vxsnap reattach or refresh

If a `vxsnap` reattach or `refresh` operation fails, the volume being refreshed may go into the DISABLED state, be marked invalid and be rendered unstartable.

To recover from the failure of the vxsnap reattach or refresh commands

1. Use the following command to check that the `inst_invalid` flag is set to `on`:

   # vxprint [-g *diskgroup*] **-F%inst_invalid** *volume*

2. Use the `vxmend` command to clear the volume's `tutil0` field:

   # vxmend [-g *diskgroup*] **clear tutil0** *volume*

3. Use the `vxsnap` command to dissociate the volume from the snapshot hierarchy:

   # vxsnap [-g *diskgroup*] **dis** *volume*

4. Use the following command to start the volume:

   # vxvol [-g *diskgroup*] **start** *volume*

5. Re-run the failed `reattach` or `refresh` command.

   This results in a full resynchronization of the volume. Alternatively, remove the snapshot volume and recreate it if required.

Recovering from copy-on-write failure

If an error is encountered while performing an internal resynchronization of a volume's snapshot, the snapshot volume goes into the INVALID state, and is made inaccessible for I/O and instant snapshot operations.

To recover from copy-on-write failure

1 Use the `vxsnap` command to dissociate the volume from the snapshot hierarchy:

```
# vxsnap [-g diskgroup] dis snapshot_volume
```

2 Unprepare the volume using the following command:

```
# vxsnap [-g diskgroup] unprepare snapshot_volume
```

3 Prepare the volume using the following command:

```
# vxsnap [-g diskgroup] prepare volume [ndcomirs=number] \
 [regionsize=size] [drl=yes|no|sequential] \
 [storage_attribute ...]
```

The volume can now be used again for snapshot operations.

Alternatively, you can remove the snapshot volume and recreate it if required.

Recovering from I/O errors during resynchronization

Snapshot resynchronization (started by `vxsnap syncstart`, or by specifying `sync=on` to `vxsnap`) stops if an I/O error occurs, and displays the following message on the system console:

```
VxVM vxsnap ERROR V-5-1-6840 Synchronization of the volume
volume stopped due to I/O error
```

After correcting the source of the error, restart the resynchronization operation.

To recover from I/O errors during resynchronization

- Type the following command:

```
# vxsnap [-b] [-g diskgroup] syncstart volume
```

Recovering from I/O failure on a DCO volume

If an I/O failure occurs on a DCO volume, its FastResync maps and DRL log cannot be accessed, and the DCO volume is marked with the BADLOG flag. DRL logging and recovery, and instant snapshot operations are not possible with the volume until you recover its DCO volume.

If the I/O failure also affects the data volume, it must be recovered before its DCO volume can be recovered.

See “Recovering a version 20 DCO volume” on page 33.

Chapter 3

Recovering from boot disk failure

This chapter includes the following topics:

VxVM and boot disk failure

Veritas Volume Manager (VxVM) protects systems from disk and other hardware failures and helps you to recover from such events. Recovery procedures help to prevent loss of data or system access due to the failure of the boot (root) disk.

The procedures for recovering volumes and their data on boot disks differ from the procedures that are used for non-boot disks.

See “About recovery from hardware failure” on page 9.

See the HP documentation Web Site at http://docs.hp.com.

Click on **Search This Site**, search for *Ignite-UX Administration Guide*, and select the link to the appropriate 11i version. For information on actions to recover your system, select “System Recovery.” Pay particular attention to the information in “Expert Recovery Using the Core Media.”

Recovering a system by booting from a VxVM root disk mirror

If a failed primary boot disk is under VxVM control and is mirrored, it must be replaced.

To recover a system by booting from a VxVM root disk mirror

1. Replace the failed disk. Depending on the system hardware, this may require you to shut down and power off the system.
2. Boot the system from a mirror of the root disk, and use the `vxrootmir` command to initialize and mirror the volumes on the new root disk:

   `# /etc/vx/bin/vxrootmir -v -b` *`new_root_disk_access_name`*

   The `-b` option sets the newly mirrored disk as the alternate boot disk in the NVRAM. The `-v` option gives progress indications as each volume is being mirrored.

Recovering a system by booting from recovery media

If there is a failure to boot from the VxVM boot disk on HP-UX 11i version 3, and no bootable root mirror is available, it may be necessary to boot from an alternate boot source, or from recovery media such as the following:

- HP-UX 11i version 3 installation disc.
- Bootable recovery tape.
- Secondary boot disk in the configuration.
- HP-UX Ignite-UX server that is accessible over a LAN.

The following problems can only be repaired if the system is booted from recovery media:

- A corrupt or non-bootable HP-UX kernel.
- Missing files that are required for booting, such as:
  - `/stand/ioconfig` file.
  - Device files in `/dev/vx`.
- Corrupted LIF area on the boot disk.

Detailed information on how to recover from these and many other failures is documented in the *Ignite-UX Administration Guide*, which is available on the HP documentation web site.

If these methods fail, use the recovery by reinstallation procedure.

See "Recovery by reinstallation" on page 46.

Starting VxVM after booting from recovery media

You can use the `vx_emerg_start` utility to start VxVM after booting a system from recovery media. This command allows a rootable VxVM configuration to be repaired in the event of a catastrophic failure.

To start VxVM after booting from recovery media

- Type the following command:

  ```
  # vx_emerg_start hostname
  ```

  The *hostname* argument specifies the name (node name) of the system that you are repairing. This name must match the name of the system that you are repairing, because it is unlikely to be recorded on the recovery media from which you booted the system.

Recovering the root volume after VxVM emergency startup

To recover the root volume after VxVM emergency startup

1 After you have used `vx_emerg_start` to start VxVM, use the `vxprint` command to determine the configuration state.

One common problem is that all the plexes of the root volume, `rootvol`, are stale. This would be shown in the `STATE` field of the `vxprint` output as follows:

```
TYNAME          ASSOC       KSTATE    LENGTH  PLOFFS  STATE   ...
vrootvol        root        DISABLED  393216  -       ACTIVE  ...
plrootvol-01    rootvol     DISABLED  393216  -       STALE   ...
sdrootdisk01-02rootvol-01 ENABLED   393216  0       -       ...
plrootvol-02    rootvol     DISABLED  393216  -       STALE   ...
sdrootdisk02-02rootvol-02 ENABLED   393216  0       -       ...
```

(The `TUTIL0` and `PUTIL0` fields have been removed from the `vxprint` output for readability.)

2 The root volume can usually be repaired by using the following command:

```
# vxvol -g bootdg -f start rootvol
```

If the root volume is mirrored, recovery is started. Wait until recovery completes and the command exits. Then run the `fsck` command and mount the root file system as shown here:

```
# fsck -F vxfs -o full /dev/vx/rdsk/bootdg/rootvol
# mkdir /tmp_mnt
# mount -F vxfs /dev/vx/dsk/bootdg/rootvol /tmp_mnt
```

The following form of the `vx_emerg_start` command combines all these operations in a single command to recover the root volume and its mirrors, check the root file system, and mount it:

```
# vx_emerg_start -m hostname
```

3 When you have recovered the volumes on the VxVM root disk, and performed any other necessary repairs, reboot the system:

```
# reboot
```

Fixing a missing or corrupt /etc/vx/volboot file

The following messages may be displayed at boot time if the `/etc/vx/volboot` file is missing or its contents are incorrect:

```
vxvm:vxconfigd: ERROR: enable failed: Volboot file not loaded
transactions are disabled.
vxvm:vxconfigd: FATAL ERROR: Bootdg cannot be imported during
boot
Error returned from vxconfigd -m boot, halting
```

During system bootup, the VxVM configuration daemon reads the file `/etc/vx/volboot`. If that file is missing or corrupted, the configuration daemon fails and aborts the boot sequence.

To fix a missing or corrupt /etc/vx/volboot file

- Reboot the system from recovery media, and run the following command:

  ```
  # vx_emerg_start -m hostname
  ```

  This determines if the `volboot` file is present, and rewrites it if it is not present.

Initiating VxVM Maintenance Mode Boot

Another method for performing limited recovery on a VxVM boot disk is to use the VxVM Maintenance Mode Boot (MMB).

To initiate VxVM MMB

- Boot the system from the primary or secondary boot device, and enter the following command at the ISL boot prompt:

  ```
  hpux -vm
  ```

  This causes the bootloader and the HP-UX kernel to take alternate actions in finding the parts of the system that are required to boot the system.

  The bootloader starts reading the `stand` file system at 1KB block 3168 instead of locating it from the LIF label. The VxVM kernel rootability code uses root volume extent information in the `/stand/rootconf` file to set up the extents of the root volume, and `init` is instructed to bring the system up to single-user mode. When invoked from the `pre_init_rc` script, the `vxconfigd` daemon exits gracefully if it determines from the kernel that the system is in MMB mode. The system is left running with only the `root` volume mounted, and VxVM runs with temporary objects pointing to the `root` volume.

  Warning: The VxVM configuration daemon, `vxconfigd`, does not normally run in MMB mode, and only one copy of the root volume data is used. If the system has a mirrored root volume, writing to the `root` file system can thus cause file system corruption when both mirrors are subsequently configured. To prevent this, start VxVM in MMB mode by running the `vx_emerg_start` command. This marks the non-boot mirror plexes as stale, and so forces a recovery from the boot mirror to the non-boot mirrors to take place. After VxVM has been started in MMB mode, various recovery options can be performed depending on the nature of the problem.

  See the `vx_emerg_start`(1M) manual page.

Recovery by reinstallation

If you configured VxVM rootability by installing via Ignite-UX, reinstalling from a saved Ignite-UX configuration is usually sufficient to recover a failed boot disk.

See the *Ignite-UX Administration Guide*.

Complete reinstallation of the software is only necessary if all copies of your boot (root) disk are damaged, or if certain critical files are lost due to file system damage. If these types of failures occur, any volumes that are not directly involved in the failure do not need to be reconfigured.

On an HP-UX 11i version 3 system, it is preferable to recover the system by booting from a VxVM root disk mirror, or by booting from recovery media.

See "Recovering a system by booting from a VxVM root disk mirror" on page 42.

See "Recovering a system by booting from recovery media" on page 42.

Recovering a system with VxVM boot disk under native multipathing

If a system with VxVM boot disk under native multipathing is unable to boot, boot the system from an alternate boot disk and use the following recovery procedures.

Scenario 1

The system is unable to boot. The following messages are displayed on the console or in syslog:

```
VxVM sysboot INFO : reading the krs value is successful value is 1

VxVM sysboot INFO V-5-2-3811 Starting in boot mode
```

To recover the system from such failure, where krs value is displayed as 1, boot the system from an alternate boot disk and follow the steps given below:

1. `# mkdir /mnt1`

2. `# fsck /dev/vx/dsk/dgname/rootvol`

   where dgname is the name of the diskgroup containing the affected boot disk.

3. `# mount /dev/vx/dsk/dgname/rootvol /mnt1`

4. ```
   # echo "/dev/disk/* foreign a block /dev/rdisk/*  \
   char" >>  /mnt1/etc/vx/darecs
   ```

5. `# umount /mnt1`

6. Reboot the system

Scenario 2

The system is unable to boot from the VxVM boot disk under native multipathing. Similar messages are displayed on the console or in syslog with krs value 0 :

```
VxVM sysboot INFO : reading the krs value is successful value is 0
```
```

To recover the system from such failure, where krs value is displayed as 0, boot the system from an alternate boot disk and follow the steps given below:

1. `# mkdir /mnt1`
2. `# fsck /dev/vx/dsk/dgname/rootvol`

   where dgname is the name of the diskgroup containing the affected boot disk.
3. `# mount /dev/vx/dsk/dgname/rootvol /mnt1`
4. `# rm /mnt1/etc/vx/darecs`
5. `# umount /mnt1`
6. Reboot the system

Chapter 4

Logging commands and transactions

This chapter includes the following topics:

Command logs

The `vxcmdlog` command allows you to log the invocation of other Veritas Volume Manager (VxVM) commands to a file.

The following examples demonstrate the usage of `vxcmdlog`:

`vxcmdlog -l`	List current settings for command logging.
`vxcmdlog -m on`	Turn on command logging.
`vxcmdlog -s 512k`	Set the maximum command log file size to 512K.
`vxcmdlog -n 10`	Set the maximum number of historic command log files to 10.
`vxcmdlog -n no_limit`	Remove any limit on the number of historic command log files.
`vxcmdlog -m off`	Turn off command logging.

Command lines are logged to the file, `cmdlog`, in the directory `/etc/vx/log`. This path name is a symbolic link to a directory whose location depends on the operating system. If required, you can redefine the directory which is linked.

If you want to preserve the settings of the `vxcmdlog` utility, you must also copy the settings file, `.cmdlog`, to the new directory.

Warning: The `.cmdlog` file is a binary and should not be edited.

The size of the command log is checked after an entry has been written so the actual size may be slightly larger than that specified. When the log reaches a maximum size, the current command log file, `cmdlog`, is renamed as the next available historic log file, *`cmdlog.number`*, where *`number`* is an integer from 1 up to the maximum number of historic log files that is currently defined, and a new current log file is created.

A limited number of historic log files is preserved to avoid filling up the file system. If the maximum number of historic log files has been reached, the oldest historic log file is removed, and the current log file is renamed as that file.

Each log file contains a header that records the host name, host ID, and the date and time that the log was created.

The following are sample entries from a command log file:

```
# 0, 2329, Wed Feb 12 21:19:31 2003
    /usr/sbin/vxdctl mode
# 17051, 2635, Wed Feb 12 21:19:33 2003
    /usr/sbin/vxdisk -q -o alldgs list
# 0, 2722, Wed Feb 12 21:19:34 2003
    /etc/vx/diag.d/vxprivutil dumpconfig /dev/vx/rdmp/Disk_4
# 26924, 3001, Thu Feb 13 19:30:57 2003
    /usr/sbin/vxdisk list Disk_1
```

Each entry usually contains a client ID that identifies the command connection to the `vxconfigd` daemon, the process ID of the command that is running, a time stamp, and the command line including any arguments.

If the client ID is 0, as in the third entry shown here, this means that the command did not open a connection to `vxconfigd`.

The client ID is the same as that recorded for the corresponding transactions in the transactions log.

See "Transaction logs" on page 51.

See "Association of command and transaction logs" on page 53.

Most command scripts are not logged, but the command binaries that they call are logged. Exceptions are the `vxdisksetup`, `vxinstall`, and `vxdiskunsetup` scripts, which are logged.

If there is an error reading from the settings file, command logging switches to its built-in default settings. This may mean, for example, that logging remains enabled after being disabled using `vxcmdlog -m off` command. If this happens, use the `vxcmdlog` utility to recreate the settings file, or restore the file from a backup.

See the `vxcmdlog`(1M) manual page.

Transaction logs

The `vxtranslog` command allows you to log VxVM transactions to a file.

The following examples demonstrate the usage of `vxtranslog`:

`vxtranslog -l`	List current settings for transaction logging.
`vxtranslog -m on`	Turn on transaction logging.
`vxtranslog -s 512k`	Set the maximum transaction log file size to 512K.
`vxtranslog -n 10`	Set the maximum number of historic transaction log files to 10.
`vxtranslog -n no_limit`	Remove any limit on the number of historic transaction log files.
`vxtranslog -q on`	Turn on query logging.
`vxtranslog -q off`	Turn off query logging.
`vxtranslog -m off`	Turn off transaction logging.

Transactions are logged to the file, `translog`, in the directory `/etc/vx/log`. This path name is a symbolic link to a directory whose location depends on the operating system. If required, you can redefine the directory which is linked. If you want to preserve the settings of the `vxtranslog` utility, you must also copy the settings file, `.translog`, to the new directory.

Warning: The `.translog` file is a binary and should not be edited.

The size of the transaction log is checked after an entry has been written so the actual size may be slightly larger than that specified. When the log reaches a

maximum size, the current transaction log file, `translog`, is renamed as the next available historic log file, *`translog.number`*, where *`number`* is an integer from 1 up to the maximum number of historic log files that is currently defined, and a new current log file is created.

A limited number of historic log files is preserved to avoid filling up the file system. If the maximum number of historic log files has been reached, the oldest historic log file is removed, and the current log file is renamed as that file.

Each log file contains a header that records the host name, host ID, and the date and time that the log was created.

The following are sample entries from a transaction log file:

```
Fri Oct 17 13:23:30 2003
Clid = 23460, PID = 21240, Part = 0, Status = 0, Abort Reason = 0
        DA_GET   Disk_0
        DISK_GET_ATTRS  Disk_0
        DISK_DISK_OP  Disk_0 8
        DEVNO_GET   Disk_0
        DANAME_GET   0x160045 0x160072
        GET_ARRAYNAME  Disk DISKS
        CTLR_PTOLNAME  11-08-01
        GET_ARRAYNAME  Disk DISKS
        CTLR_PTOLNAME  21-08-01
        DROPPED  <no request data>
```

The first line of each log entry is the time stamp of the transaction. The `Clid` field corresponds to the client ID for the connection that the command opened to `vxconfigd`. The `PID` field shows the process ID of the utility that is requesting the operation. The `Status` and `Abort Reason` fields contain error codes if the transaction does not complete normally. The remainder of the record shows the data that was used in processing the transaction.

The client ID is the same as that recorded for the corresponding command line in the command log.

See “Command logs” on page 49.

See “Association of command and transaction logs” on page 53.

If there is an error reading from the settings file, transaction logging switches to its built-in default settings. This may mean, for example, that logging remains enabled after being disabled using `vxtranslog -m off` command. If this happens, use the `vxtranslog` utility to recreate the settings file, or restore the file from a backup.

Association of command and transaction logs

The Client and process IDs that are recorded for every request and command assist you in correlating entries in the command and transaction logs. To find out which command issued a particular request in transaction log, use a command such as the following to search for the process ID and the client ID in the command log:

```
# egrep -n PID cmdlog | egrep Clid
```

In this example, the following request was recorded in the transaction log:

```
Wed Feb 12 21:19:36 2003
Clid = 8309, PID = 2778, Part = 0, Status = 0, Abort Reason = 0
    DG_IMPORT foodg
    DG_IMPORT foodg
    DISCONNECT <no request data>
```

To locate the utility that issued this request, the command would be:

```
# egrep -n 2778 cmdlog | egrep 8309
7310:# 8309, 2778, Wed Feb 12 21:19:36 2003
```

The output from the example shows a match at line 7310 in the command log. Examining lines 7310 and 7311 in the command log indicates that the `vxdg import` command was run on the `foodg` disk group:

```
# sed -e '7310,7311!d' cmdlog
# 8309, 2778, Wed Feb 12 21:19:36 2003 7311
/usr/sbin/vxdg -m import foodg
```

If there are multiple matches for the combination of the client and process ID, you can determine the correct match by examining the time stamp.

If a utility opens a conditional connection to `vxconfigd`, its client ID is shown as zero in the command log, and as a non-zero value in the transaction log. You can use the process ID and time stamp to relate the log entries in such cases.

Chapter 5

Backing up and restoring disk group configurations

This chapter includes the following topics:

About disk group configuration backup

Disk group configuration backup and restoration allows you to backup and restore all configuration data for Veritas Volume Manager (VxVM) disk groups, and for VxVM objects such as volumes that are configured within the disk groups. Using this feature, you can recover from corruption of a disk group's configuration that is stored as metadata in the private region of a VM disk. After the disk group configuration has been restored, and the volume enabled, the user data in the public region is available again without the need to restore this from backup media.

Warning: The backup and restore utilities act only on VxVM configuration data. They do not back up or restore any user or application data that is contained within volumes or other VxVM objects. If you use `vxdiskunsetup` and `vxdisksetup` on a disk, and specify attributes that differ from those in the configuration backup, this may corrupt the public region and any data that it contains.

The `vxconfigbackupd` daemon monitors changes to the VxVM configuration and automatically records any configuration changes that occur. Two utilities,

`vxconfigbackup` and `vxconfigrestore`, are provided for backing up and restoring a VxVM configuration for a disk group.

When importing a disk group, any of the following errors indicate that the disk group configuration and/or disk private region headers have become corrupted:

```
VxVM vxconfigd ERROR V-5-1-569 Disk group group,Disk disk:Cannot
auto-import group: reason
```

The reason for the error is usually one of the following:

```
Configuration records are inconsistent
Disk group has no valid configuration copies
Duplicate record in configuration
Errors in some configuration copies
Format error in configuration copy
Invalid block number
Invalid magic number
```

If VxVM cannot update a disk group's configuration because of disk errors, it disables the disk group and displays the following error:

```
VxVM vxconfigd ERROR V-5-1-123 Disk group group: Disabled by errors
```

If such errors occur, you can restore the disk group configuration from a backup after you have corrected any underlying problem such as failed or disconnected hardware.

Configuration data from a backup allows you to reinstall the private region headers of VxVM disks in a disk group whose headers have become damaged, to recreate a corrupted disk group configuration, or to recreate a disk group and the VxVM objects within it. You can also use the configuration data to recreate a disk group on another system if the original system is not available.

Note: Restoration of a disk group configuration requires that the same physical disks are used as were configured in the disk group when the backup was taken.

See "Backing up a disk group configuration" on page 56.

See "Restoring a disk group configuration" on page 57.

Backing up a disk group configuration

VxVM uses the disk group configuration daemon to monitor the configuration of disk groups, and to back up the configuration whenever it is changed. By default,

the five most recent backups are preserved. If required, you can also back up a disk group configuration by running the `vxconfigbackup` command.

The following files record disk group configuration information:

/etc/vx/cbr/bk/diskgroup.dgid/dgid.dginfo	Disk group information.
/etc/vx/cbr/bk/diskgroup.dgid/dgid.diskinfo	Disk attributes.
/etc/vx/cbr/bk/diskgroup.dgid/dgid.binconfig	Binary configuration copy.
/etc/vx/cbr/bk/diskgroup.dgid/dgid.cfgrec	Configuration records in `vxprint -m` format.

Here *diskgroup* is the name of the disk group, and *dgid* is the disk group ID. If a disk group is to be recreated on another system, copy these files to that system.

Warning: Take care that you do not overwrite any files on the target system that are used by a disk group on that system.

To back up a disk group configuration

- Type the following command:

  # /etc/vx/bin/vxconfigbackup *diskgroup*

  To back up all disk groups, use this version of the command:

  # /etc/vx/bin/vxconfigbackup

  See the `vxconfigbackup`(1M) manual page.

Restoring a disk group configuration

You can use the `vxconfigrestore` utility to restore or recreate a disk group from its configuration backup. The restoration process consists of a precommit operation followed by a commit operation. At the precommit stage, you can examine the configuration of the disk group that would be restored from the backup. The actual disk group configuration is not permanently restored until you choose to commit the changes.

Warning: None of the disks or VxVM objects in the disk group may be open or in use by any application while the restoration is being performed.

You can choose whether or not any corrupted disk headers are to be reinstalled at the precommit stage. If any of the disks' private region headers are invalid, restoration may not be possible without reinstalling the headers for the affected disks.

See the `vxconfigrestore`(1M) manual page.

To perform the precommit operation

- Use the following command to perform a precommit analysis of the state of the disk group configuration, and to reinstall the disk headers where these have become corrupted:

  ```
  # /etc/vx/bin/vxconfigrestore -p [-l directory] \
    {diskgroup | dgid}
  ```

  The disk group can be specified either by name or by ID.

  The `-l` option allows you to specify a directory for the location of the backup configuration files other than the default location, `/etc/vx/cbr/bk`.

  See Backing up a disk group configuration for details.

To specify that the disk headers are not to be reinstalled

- Type the following command:

  ```
  # /etc/vx/bin/vxconfigrestore -n [-l directory] \
    {diskgroup | dgid}
  ```

  At the precommit stage, you can use the `vxprint` command to examine the configuration that the restored disk group will have. You can choose to proceed to commit the changes and restore the disk group configuration. Alternatively, you can cancel the restoration before any permanent changes have been made.

To abandon restoration at the precommit stage

- Type the following command:

  ```
  # /etc/vx/bin/vxconfigrestore -d [-l directory] \
    {diskgroup | dgid}
  ```

To perform the commit operation

- To commit the changes that are required to restore the disk group configuration, use the following command:

  ```
  # /etc/vx/bin/vxconfigrestore -c [-l directory] \
    {diskgroup | dgid}
  ```

  If no disk headers are reinstalled, the configuration copies in the disks' private regions are updated from the latest binary copy of the configuration that was saved for the disk group.

  If any of the disk headers are reinstalled, a saved copy of the disks' attributes is used to recreate their private and public regions. These disks are also assigned new disk IDs. The VxVM objects within the disk group are then recreated using the backup configuration records for the disk group. This process also has the effect of creating new configuration copies in the disk group.

  Volumes are synchronized in the background. For large volume configurations, it may take some time to perform the synchronization. You can use the `vxtask -l list` command to monitor the progress of this operation.

  Disks that are in use or whose layout has been changed are excluded from the restoration process.

Resolving conflicting backups for a disk group

In some circumstances where disks have been replaced on a system, there may exist several conflicting backups for a disk group. In this case, you see a message similar to the following from the `vxconfigrestore` command:

```
VxVM vxconfigrestore ERROR V-5-1-6012 There are two backups that
have the same diskgroup name with different diskgroup id :
1047336696.19.xxx.veritas.com

1049135264.31.xxx.veritas.com
```

The solution is to specify the disk group by its ID rather than by its name to perform the restoration. The backup file, */etc/vx/cbr/bk/diskgroup. dgid/dgid.dginfo*, contains a timestamp that records when the backup was taken.

The following is a sample extract from such a backup file that shows the timestamp and disk group ID information:

```
TIMESTAMP
Tue Apr 15 23:27:01 PDT 2003
```

```
.
.
.
DISK_GROUP_CONFIGURATION
Group:     mydg
dgid: 1047336696.19.xxx.veritas.com
.
.
.
```

Use the timestamp information to decide which backup contains the relevant information, and use the `vxconfigrestore` command to restore the configuration by specifying the disk group ID instead of the disk group name.

Chapter 6

Error messages

This chapter includes the following topics:

About error messages

Informational, failure, and other error messages may be displayed on the console by the Veritas Volume Manager (VxVM) configuration daemon (`vxconfigd`), the VxVM kernel driver, `vxio`, and the various VxVM commands. These messages may indicate errors that are infrequently encountered and difficult to troubleshoot.

Note: Some error messages described here may not apply to your system.

You may find it useful to consult the VxVM command and transaction logs to understand the context in which an error occurred.

See "Command logs" on page 49.

How error messages are logged

VxVM provides the option of logging debug messages to a file. This logging is useful in that any messages output just before a system crash will be available in the log file (presuming that the crash does not result in file system corruption).

If enabled, the default debug log file is `/var/adm/configd.log`.

To enable logging of debug output to the default debug log file, edit the startup script for `vxconfigd`.

vxconfigd also supports the use of syslog to log all of its regular console messages. When this is enabled, all console output is directed through the syslog interface.

syslog and log file logging can be used together to provide reliable logging to a private log file, along with distributed logging through syslogd.

Note: syslog logging is enabled by default. Debug message logging is disabled by default.

If syslog output is enabled, messages with a priority higher than Debug are written to /var/adm/syslog/syslog.log.

See "Configuring logging in the startup script" on page 62.

Alternatively, you can use the following command to change the debug level:

```
# vxdctl debug level [pathname]
```

There are 10 possible levels of debug logging with the values 0 through 9. Level 1 provides the least detail, and 9 the most. Level 0 turns off logging. If a path name is specified, this file is used to record the debug output instead of the default debug log file. If the vxdctl debug command is used, the new debug logging level and debug log file remain in effect until the VxVM configuration daemon, vxconfigd, is next restarted.

See the vxdctl(1M) manual page.

See the vxconfigd(1M) manual page.

Configuring logging in the startup script

To enable log file or syslog logging on a permanent basis, you can edit the /sbin/init.d/vxvm-sysboot script that starts the VxVM configuration daemon, vxconfigd.

To configure logging in the startup script

- Comment-out or uncomment any of the following lines to enable or disable the corresponding feature in `vxconfigd`:

```
opts="$opts -x syslog"
# use syslog for console messages
#opts="$opts -x log"
# messages to vxconfigd.log
#opts="$opts -x logfile=/foo/bar" # specify an alternate log file
#opts="$opts -x timestamp"
# timestamp console messages

# To turn on debugging console output, uncomment the following line.
# The debug level can be set higher for more output. The highest
# debug level is 9.

#debug=1
# enable debugging console output
```

  The `opts="$opts -x syslog"` string is usually uncommented so that `vxconfigd` uses `syslog` logging by default. Inserting a `#` character at the beginning of the line turns off `syslog` logging for `vxconfigd`.

  By default, vxconfigd is started at boot time with the `-x syslog` option. This redirects `vxconfigd` console messages to `syslog`. If you want to retain this behavior when restarting `vxconfigd` from the command line, include the `-x syslog` argument, as restarting `vxconfigd` does not preserve the option settings with which it was previously running. Similarly, any Veritas Volume Manager operations that require `vxconfigd` to be restarted may not retain the behavior that was previously specified by option settings.

Types of messages

VxVM is fault-tolerant and resolves most problems without system administrator intervention. If the configuration daemon, `vxconfigd`, recognizes the actions that are necessary, it queues up the transactions that are required. VxVM provides atomic changes of system configurations; either a transaction completes fully, or the system is left in the same state as though the transaction was never attempted. If `vxconfigd` is unable to recognize and fix system problems, the system administrator needs to handle the task of problem solving using the diagnostic messages that are returned from the software. The following sections describe error message numbers and the types of error message that may be seen, and

provide a list of the more common errors, a detailed description of the likely cause of the problem together with suggestions for any actions that can be taken.

Messages have the following generic format:

```
product component severity message_number message_text
```

For Veritas Volume Manager, the product is set to `VxVM`. The component can be the name of a kernel module or driver such as `vxdmp`, a configuration daemon such as `vxconfigd`, or a command such as `vxassist`.

Messages are divided into the following types of severity in decreasing order of impact on the system:

PANIC

A panic is a severe event as it halts a system during its normal operation. A panic message from the kernel module or from a device driver indicates a hardware problem or software inconsistency so severe that the system cannot continue. The operating system may also provide a dump of the CPU register contents and a stack trace to aid in identifying the cause of the panic. The following is an example of such a message:

```
VxVM vxio PANIC V-5-0-239 Object association
depth overflow
```

FATAL ERROR

A fatal error message from a configuration daemon, such as `vxconfigd`, indicates a severe problem with the operation of VxVM that prevents it from running. The following is an example of such a message:

VxVM vxconfigd FATAL ERROR V-5-0-591 Disk group bootdg: Inconsistency -- Not loaded into kernel

ERROR

An error message from a command indicates that the requested operation cannot be performed correctly. The following is an example of such a message:

VxVM *vxassist ERROR V-5-1-5150 Insufficient number of active snapshot mirrors in snapshot_volume .*

WARNING

A warning message from the kernel indicates that a non-critical operation has failed, possibly because some resource is not available or the operation is not possible. The following is an example of such a message:

```
VxVM vxio WARNING V-5-0-55 Cannot find device
number for boot_path
```

NOTICE	A notice message indicates that an error has occurred that should be monitored. Shutting down the system is unnecessary, although you may need to take action to remedy the fault at a later date. The following is an example of such a message: *VxVM vxio NOTICE V-5-0-252 read error on object subdisk of mirror plex in volume volume (start offset, length length) corrected.*
INFO	An informational message does not indicate an error, and requires no action.

The unique message number consists of an alpha-numeric string that begins with the letter "V". For example, in the message number, `V-5-1-3141`, "V" indicates that this is a Veritas product error message, the first numeric field (5) encodes the product (in this case, VxVM), the second field (1) represents information about the product component, and the third field (3141) is the message index. The text of the error message follows the message number.

Messages

This section contains a list of messages that you may encounter during the operation of Veritas Volume Manager. However, the list is not exhaustive and the second field may contain the name of different command, driver or module from that shown here.

Descriptions are included to elaborate on the situation or problem that generated a particular message. Wherever possible, a recovery procedure is provided to help you to locate and correct the problem.

If you encounter a product error message, record the unique message number preceding the text of the message. Information about that message number is online at the following URL:

https://vias.symantec.com/labs/vels/

When contacting Veritas Technical Support, either by telephone or by visiting the Veritas Technical Support website, be sure to provide the relevant message number. Veritas Technical Support will use this message number to quickly determine if there are TechNotes or other information available for you.

V-5-0-2

`VxVM vxio WARNING V-5-0-2 object_type object_name`
`block`*`offset`*`:Uncorrectable read error ...`

```
VxVM vxio WARNING V-5-0-2 object_type object_name
blockoffset:Uncorrectable write error ...
```

Description:

A read or write operation from or to the specified Veritas Volume Manager object failed. An error is returned to the application.

Recommended action:

These errors may represent lost data. Data may need to be restored and failed media may need to be repaired or replaced. Depending on the type of object failing and on the type of recovery suggested for the object type, an appropriate recovery operation may be necessary.

V-5-0-4

```
VxVM vxio WARNING V-5-0-4 Plex plex detached from volume volume
```

Description:

An uncorrectable error was detected by the mirroring code and a mirror copy was detached.

This message may also appear during a plex detach operation in a cluster.

Recommended action:

To restore redundancy, it may be necessary to add another mirror. The disk on which the failure occurred should be reformatted or replaced.

If this message appears during a plex detach operation in a cluster, no action is required.

V-5-0-34

```
VxVM vxdmp NOTICE V-5-0-34 added disk array disk_array_serial_number
```

Description:

A new disk array has been added to the host.

Recommended action:

No recovery procedure is required.

V-5-0-35

```
VxVM vxdmp NOTICE V-5-0-35 Attempt to disable controller
controller_name failed. Rootdisk has just one enabled path.
```

Description:

An attempt is being made to disable the one remaining active path to the root disk controller.

Recommended action:

The path cannot be disabled.

V-5-0-55

`VxVM vxio WARNING V-5-0-55 Cannot find device number for boot_path`

`vxvm vxdmp WARNING V-5-0-55 Cannot find device number for boot_path`

Description:

The boot path retrieved from the system PROMs cannot be converted to a valid device number.

Recommended action:

Check your PROM settings for the correct boot string. If a target driver, such as an ATF, coexists with VxVM, and the target driver claims the boot disk, the message may be ignored if the device path corresponds to the boot disk.

V-5-0-64

`VxVM vxio WARNING V-5-0-64 cannot log commit record for Diskgroup bootdg: error 28`

Description:

This message usually means that multipathing is misconfigured.

Recommended action:

Possible causes and solutions are similar to the message V-5-1-5929.

See "V-5-1-5929" on page 114.

V-5-0-106

`VxVM vxio WARNING V-5-0-106 detaching RAID-5 volume`

Description:

Either a double-failure condition in the RAID-5 volume has been detected in the kernel or some other fatal error is preventing further use of the array.

Recommended action:

If two or more disks have been lost due to a controller or power failure, use the `vxrecover` utility to recover them once they have been re-attached to the system.

Check for other console error messages that may provide additional information about the failure.

V-5-0-108

`VxVM vxio WARNING V-5-0-108 Device major, minor: Received spurious close`

Description:

A close was received for an object that was not open. This can only happen if the operating system is not correctly tracking opens and closes.

Recommended action:

No action is necessary; the system will continue.

V-5-0-110

`VxVM vxdmp NOTICE V-5-0-110 disabled controller controller_name connected to disk array disk_array_serial_number`

Description:

All paths through the controller connected to the disk array are disabled. This usually happens if a controller is disabled for maintenance.

Recommended action:

No recovery procedure is required.

V-5-0-111

`VxVM vxdmp NOTICE V-5-0-111 disabled dmpnode dmpnode_device_number`

Description:

A Dynamic Multipathing (DMP) node has been marked disabled in the DMP database. It will no longer be accessible for further IO requests. This occurs when all paths controlled by a DMP node are in the disabled state, and therefore inaccessible.

Recommended action:

Check hardware or enable the appropriate controllers to enable at least one path under this DMP node.

V-5-0-112

`VxVM vxdmp NOTICE V-5-0-112 disabled path path_device_number belonging to dmpnode dmpnode_device_number`

Description:

A path has been marked disabled in the DMP database. This path is controlled by the DMP node indicated by the specified device number. This may be due to a hardware failure.

Recommended action:

Check the underlying hardware if you want to recover the desired path.

V-5-0-144

`VxVM vxio WARNING V-5-0-144 Double failure condition detected on RAID-5 volume`

Description:

I/O errors have been received in more than one column of a RAID-5 volume.

The error can be caused by one of the following problems:

- a controller failure making more than a single drive unavailable
- the loss of a second drive while running in degraded mode
- two separate disk drives failing simultaneously (unlikely)

Recommended action:

Correct the hardware failures if possible. Then recover the volume using the `vxrecover` command.

V-5-0-145

`VxVM vxio WARNING V-5-0-145 DRL volume volume is detached`

Description:

A Dirty Region Logging volume became detached because a DRL log entry could not be written. If this is due to a media failure, other errors may have been logged to the console.

Recommended action:

The volume containing the DRL log continues in operation. If the system fails before the DRL has been repaired, a full recovery of the volume's contents may be necessary and will be performed automatically when the system is restarted. To recover from this error, use the `vxassist addlog` command to add a new DRL log to the volume.

V-5-0-146

`VxVM vxdmp NOTICE V-5-0-146 enabled controller` *`controller_name`* `connected to disk array` *`disk_array_serial_number`*

Description:

All paths through the controller connected to the disk array are enabled. This usually happens if a controller is enabled after maintenance.

Recommended action:

No recovery procedure is required.

V-5-0-147

`VxVM vxdmp NOTICE V-5-0-147 enabled dmpnode` *`dmpnode_device_number`*

A DMP node has been marked enabled in the DMP database. This happens when at least one path controlled by the DMP node has been enabled.

Recommended action:

No recovery procedure is required.

V-5-0-148

`VxVM vxdmp NOTICE V-5-0-148 enabled path` *`path_device_number`* `belonging to dmpnode` *`dmpnode_device_number`*

Description:

A path has been marked enabled in the DMP database. This path is controlled by the DMP node indicated by the specified device number. This happens if a previously disabled path has been repaired, the user has reconfigured the DMP database using the `vxdctl`(1M) command, or the DMP database has been reconfigured automatically.

Recommended action:

No recovery procedure is required.

V-5-0-164

`VxVM vxio WARNING V-5-0-164 Failed to join cluster` *`name`*`, aborting`

Description:

A node failed to join a cluster. This may be caused by the node being unable to see all the shared disks. Other error messages may provide more information about the disks that cannot be found.

Recommended action:

Use the `vxdisk -s list` command on the master node to see what disks should be visible to the slave node. Then check that the operating system and VxVM on the failed node can also see these disks. If the operating system cannot see the disks, check the cabling and hardware configuration of the node. If only VxVM cannot see the disks, use the `vxdctl enable` command to make it scan again for the disks. When the disks are visible to VxVM on the node, retry the join.

V-5-0-166

`VxVM vxio WARNING V-5-0-166 Failed to log the detach of the DRL volume` *`volume`*

Description:

An attempt failed to write a kernel log entry indicating the loss of a DRL volume. The attempted write to the log failed either because the kernel log is full, or because of a write error to the drive. The volume becomes detached.

Recommended action:

Messages about log failures are usually fatal, unless the problem is transient. However, the kernel log is sufficiently redundant that such errors are unlikely to occur.

If the problem is not transient (that is, the drive cannot be fixed and brought back online without data loss), recreate the disk group from scratch and restore all of its volumes from backups. Even if the problem is transient, reboot the system after correcting the problem.

If error messages are seen from the disk driver, it is likely that the last copy of the log failed due to a disk error. Replace the failed drive in the disk group. The log re-initializes on the new drive. Finally force the failed volume into an active state and recover the data.

V-5-0-168

`VxVM vxio WARNING V-5-0-168 Failure in RAID-5 logging operation`

Description:

Indicates that a RAID-5 log has failed.

Recommended action:

To restore RAID-5 logging to a RAID-5 volume, create a new log plex and attach it to the volume.

V-5-0-181

`VxVM vxio WARNING V-5-0-181 Illegal vminor encountered`

Description:

An attempt was made to open a volume device (other than the root volume device) before `vxconfigd` loaded the volume configuration.

Recommended action:

No recovery procedure is required. Under normal startup conditions, this message should not occur. If necessary, start VxVM and re-attempt the operation.

V-5-0-194

`VxVM vxio WARNING V-5-0-194 Kernel log full: volume detached`

Description:

A plex detach failed because the kernel log was full. As a result, the mirrored volume will become detached.

Recommended action:

This condition is unlikely to occur. The only corrective action is to reboot the system.

V-5-0-196

`VxVM vxio WARNING V-5-0-196 Kernel log update failed: volume detached`

Description:

Detaching a plex failed because the kernel log could not be flushed to disk. As a result, the mirrored volume became detached. This may be caused by all the disks containing a kernel log going bad.

Recommended action:

Repair or replace the failed disks so that kernel logging can once again function.

V-5-0-207

`VxVM vxio WARNING V-5-0-207 log object object_name detached from RAID-5 volume`

Description:

This message indicates that a RAID-5 log has failed.

Recommended action:

To restore RAID-5 logging to a RAID-5 volume, create a new log plex and attach it to the volume.

V-5-0-216

`VxVM vxio WARNING V-5-0-216 mod_install returned` *`errno`*

Description:

A call made to the operating system `mod_install` function to load the `vxio` driver failed.

Recommended action:

Check for additional console messages that may explain why the load failed. Also check the console messages log file for any additional messages that were logged but not displayed on the console.

V-5-0-237

`VxVM vxio WARNING V-5-0-237` *`object subdisk`* `detached from RAID-5` *`volume`* `at column` *`column`* `offset` *`offset`*

Description:

A subdisk was detached from a RAID-5 volume because of the failure of a disk or an uncorrectable error occurring on that disk.

Recommended action:

Check for other console error messages indicating the cause of the failure. Replace a failed disk as soon as possible.

V-5-0-243

`VxVM vxio WARNING V-5-0-243 Overlapping mirror plex detached from volume` *`volume`*

Description:

An error has occurred on the last complete plex in a mirrored volume. Any sparse mirrors that map the failing region are detached so that they cannot be accessed to satisfy that failed region inconsistently.

Recommended action:

The message indicates that some data in the failing region may no longer be stored redundantly.

V-5-0-244

`VxVM vxdmp NOTICE V-5-0-244 Path failure on major/minor`

Description:

A path under the control of the DMP driver failed. The device major and minor numbers of the failed device is supplied in the message.

Recommended action:

No recovery procedure is required.

V-5-0-249

`VxVM vxio WARNING V-5-0-249 RAID-5 volume entering degraded mode operation`

Description:

An uncorrectable error has forced a subdisk to detach. At this point, not all data disks exist to provide the data upon request. Instead, parity regions are used to regenerate the data for each stripe in the array. Consequently, access takes longer and involves reading from all drives in the stripe.

Recommended action:

Check for other console error messages that indicate the cause of the failure. Replace any failed disks as soon as possible.

V-5-0-251

`VxVM vxio WARNING V-5-0-251 read error on object object of mirror plexin volume volume (start offset length length)`

Description:

An error was detected while reading from a mirror. This error may lead to further action shown by later error messages.

Recommended action:

If the volume is mirrored, no further action is necessary since the alternate mirror's contents will be written to the failing mirror; this is often sufficient to correct media failures. If this error occurs often, but never leads to a plex detach, there may be a marginally defective region on the disk at the position indicated. It may eventually be necessary to remove data from this disk and then to reformat the drive.

See the `vxevac`(1M) manual page.

If the volume is not mirrored, this message indicates that some data could not be read. The file system or other application reading the data may report an additional error, but in either event, data has been lost. The volume can be partially salvaged and moved to another location if desired.

This message may also appear during a plex detach operation in a cluster. In this case, no action is required.

V-5-0-252

`VxVM vxio NOTICE V-5-0-252 read error on object subdisk of mirror plex in volume volume (start offset length length) corrected`

Description:

A read error occurred, which caused a read of an alternate mirror and a writeback to the failing region. This writeback was successful and the data was corrected on disk.

Recommended action:

No recovery procedure is required. The problem was corrected automatically. Note the location of the failure for future reference. If the same region of the subdisk fails again, this may indicate a more insidious failure and the disk should be reformatted at the next reasonable opportunity.

V-5-0-258

`VxVM vxdmp NOTICE V-5-0-258 removed disk array disk_array_serial_number`

Description:

A disk array has been disconnected from the host, or some hardware failure has resulted in the disk array becoming inaccessible to the host.

Recommended action:

Replace disk array hardware if this has failed.

V-5-0-386

`VxVM vxio WARNING V-5-0-386 subdisk subdisk failed in plex plex in volume volume`

Description:

The kernel has detected a subdisk failure, which may mean that the underlying disk is failing.

Recommended action:

Check for obvious problems with the disk (such as a disconnected cable). If hot-relocation is enabled and the disk is failing, recovery from subdisk failure is handled automatically.

V-5-1-90

`VxVM vxconfigd ERROR V-5-1-90 mode: Unrecognized operating mode`

Description:

An invalid string was specified as an argument to the `-m` option. Valid strings are: `enable`, `disable`, and `boot`.

Recommended action:

Supply a correct option argument.

V-5-1-91

`VxVM vxconfigd WARNING V-5-1-91 Cannot create device device_path: reason`

Description:

`vxconfigd` cannot create a device node either under `/dev/vx/dsk` or under `/dev/vx/rdsk`. This should happen only if the `root` file system has run out of inodes.

Recommended action:

Remove some unwanted files from the `root` file system. Then, regenerate the device node using this command:

```
# vxdctl enable
```

V-5-1-92

`VxVM vxconfigd WARNING V-5-1-92 Cannot exec /usr/bin/rm to remove directory: reason`

Description:

The given directory could not be removed because the `/usr/bin/rm` utility could not be executed by `vxconfigd`. This is not a serious error. The only side effect of a directory not being removed is that the directory and its contents continue to use space in the `root` file system. However, this does imply that the `/usr` file system is not mounted, or on some systems, that the `rm` utility is missing or is not

in its usual location. This may be a serious problem for the general running of your system.

Recommended action:

If the `/usr` file system is not mounted, you need to determine how to get it mounted. If the `rm` utility is missing, or is not in the `/usr/bin` directory, restore it.

V-5-1-111

`VxVM vxconfigd WARNING V-5-1-111 Cannot fork to remove directory` *`directory: reason`*

Description:

The given directory could not be removed because `vxconfigd` could not fork in order to run the `rm` utility. This is not a serious error. The only side effect of a directory not being removed is that the directory and its contents will continue to use space in the `root` file system. The most likely cause for this error is that your system does not have enough memory or paging space to allow `vxconfigd` to fork.

Recommended action:

If your system is this low on memory or paging space, your overall system performance is probably substantially degraded. Consider adding more memory or paging space.

V-5-1-116

`VxVM vxconfigd WARNING V-5-1-116 Cannot open log file` *`log_filename: reason`*

Description:

The `vxconfigd` console output log file could not be opened for the given reason.

Recommended action:

Create any needed directories, or use a different log file path name.

See "How error messages are logged" on page 61.

V-5-1-117

`VxVM vxconfigd ERROR V-5-1-117 Cannot start volume` *`volume`*`, no valid plexes`

Description:

This error indicates that the volume cannot be started because it does not contain any valid plexes. This can happen, for example, if disk failures have caused all plexes to be unusable. It can also happen as a result of actions that caused all plexes to become unusable (for example, forcing the dissociation of subdisks or detaching, dissociation, or offlining of plexes).

Recommended action:

It is possible that this error results from a drive that failed to spin up. If so, rebooting may fix the problem. If that does not fix the problem, then the only recourse is to repair the disks involved with the plexes and restore the file system from a backup.

V-5-1-121

`VxVM vxconfigd NOTICE V-5-1-121 Detached disk` *`disk`*

Description:

The named disk appears to have become unusable and was detached from its disk group. Additional messages may appear to indicate other records detached as a result of the disk detach.

Recommended action:

If hot-relocation is enabled, Veritas Volume Manager objects affected by the disk failure are taken care of automatically. Mail is sent to `root` indicating what actions were taken by VxVM and what further actions the administrator should take.

V-5-1-122

`VxVM vxconfigd WARNING V-5-1-122 Detaching plex` *`plex`* `from volume` *`volume`*

Description:

This error only happens for volumes that are started automatically by `vxconfigd` at system startup (that is, the `root` and `/usr` file system volumes). The plex is being detached as a result of I/O failure, disk failure during startup or prior to the last system shutdown or crash, or disk removal prior to the last system shutdown or crash.

Recommended action:

To ensure that the `root` or `/usr` file system retains the same number of active mirrors, remove the given plex and add a new mirror using the `vxassist mirror` operation. Also consider replacing any bad disks before running this command.

V-5-1-123

`VxVM vxconfigd ERROR V-5-1-123 Disk group group: Disabled by errors`

Description:

This message indicates that some error condition has made it impossible for VxVM to continue to manage changes to a disk group. The major reason for this is that too many disks have failed, making it impossible for `vxconfigd` to continue to update configuration copies. There should be a preceding error message that indicates the specific error that was encountered.

If the disk group that was disabled is the boot disk group, the following additional error is displayed:

`VxVM vxconfigd ERROR V-5-1-104 All transactions are disabled`

This additional message indicates that `vxconfigd` has entered the `disabled` state, which makes it impossible to change the configuration of any disk group, not just the boot disk group.

Recommended action:

If the underlying error resulted from a transient failure, such as a disk cabling error, then you may be able to repair the situation by rebooting. Otherwise, the disk group configuration may have to be recreated, and the contents of any volumes restored from a backup.

See "Restoring a disk group configuration" on page 57.

Failure of the boot disk group may require reinstallation of the system if your system uses a `root` or `/usr` file system that is defined on a volume.

V-5-1-124

`VxVM vxconfigd ERROR V-5-1-124 Disk group group: update failed: reason`

Description:

I/O failures have prevented `vxconfigd` from updating any active copies of the disk group configuration. This usually implies a large number of disk failures. This error will usually be followed by the error:

`VxVM vxconfigd ERROR V-5-1-123 Disk group group: Disabled by errors`

Recommended action:

If the underlying error resulted from a transient failure, such as a disk cabling error, then you may be able to repair the situation by rebooting. Otherwise, the disk group may have to be recreated and restored from a backup.

V-5-1-134

`VxVM vxconfigd ERROR V-5-1-134 Memory allocation failure`

Description:

This implies that there is insufficient memory to start VxVM.

Recommended action:

This error should not normally occur, unless your system has very small amounts of memory. Adding swap space will probably not help because this error is most likely to occur early in the boot sequence, before swap areas have been added.

V-5-1-135

`VxVM vxconfigd FATAL ERROR V-5-1-135 Memory allocation failure during startup`

Description:

This implies that there is insufficient memory to start up VxVM.

Recommended action:

This error should not normally occur, unless your system has very small amounts of memory. Adding swap space probably will not help, because this error is most likely to occur early in the boot sequence, before swap areas have been added.

V-5-1-148

`VxVM vxconfigd ERROR V-5-1-148 System startup failed`

Description:

Either the `root` or the `/usr` file system volume could not be started, rendering the system unusable. The error that resulted in this condition should appear prior to this error message.

Recommended action:

Look up other error messages appearing on the console and take the actions suggested in the descriptions of those messages.

V-5-1-169

`VxVM vxconfigd ERROR V-5-1-169 cannot open /dev/vx/config: `*`reason`*

`VxVM vxconfigd ERROR V-5-1-169 Cannot open /etc/fstab: `*`reason`*

Description:

This message has the following variations:

- Case 1: `cannot open /dev/vx/config: reason`

  The `/dev/vx/config` device could not be opened. `vxconfigd` uses this device to communicate with the Veritas Volume Manager kernel drivers. The most likely reason is "Device is already open." This indicates that some process (most likely `vxconfigd`) already has `/dev/vx/config` open. Less likely reasons are "No such file or directory" or "No such device or address."

  The following are likely causes:

  - The Veritas Volume Manager package installation did not complete correctly.
  - The device node was removed by the administrator or by an errant shell script.

- Case 2: `vxconfigd` could not open the `/etc/fstab` file, for the reason given. The `/etc/fstab` file is used to determine which volume (if any) to use for the `/usr` file system.

Recommended action:

For Case 1, if the reason is "Device is already open," stop or kill the old `vxconfigd` by running the command:

```
# vxdctl -k stop
```

For other failure reasons, consider re-adding the base Veritas Volume Manager package. This will reconfigure the device node and re-install the Veritas Volume Manager kernel device drivers. If you cannot re-install the package, contact Veritas Technical Support for more information.

For Case 2, this error implies that your `root` file system is currently unusable. You may be able to repair the `root` file system by mounting it after booting from a network or CD-ROM `root` file system.

See "VxVM and boot disk failure" on page 41.

V-5-1-249

`VxVM vxconfigd NOTICE V-5-1-249 Volume volume entering degraded mode`

Description:

Detaching a subdisk in the named RAID-5 volume has caused the volume to enter "degraded" mode. While in degraded mode, performance of the RAID-5 volume is substantially reduced. More importantly, failure of another subdisk may leave the RAID-5 volume unusable. Also, if the RAID-5 volume does not have an active log, then failure of the system may leave the volume unusable.

Recommended action:

If hot-relocation is enabled, Veritas Volume Manager objects affected by the disk failure are taken care of automatically. Mail is sent to `root` indicating what actions were taken by VxVM, and what further actions you should take.

V-5-1-480

`VxVM vxconfigd ERROR V-5-1-480 Cannot reset VxVM kernel: reason`

Description:

The `-r reset` option was specified to `vxconfigd`, but the VxVM kernel drivers could not be reset. The most common reason is "A virtual disk device is open." This implies that a VxVM tracing or volume device is open.

Recommended action:

If you want to reset the kernel devices, track down and kill all processes that have a volume or Veritas Volume Manager tracing device open. Also, if any volumes are mounted as file systems, unmount those file systems.

Any reason other than "A virtual disk device is open" does not normally occur unless there is a bug in the operating system or in VxVM.

V-5-1-484

`VxVM vxconfigd ERROR V-5-1-484 Cannot start volume volume, no valid complete plexes`

Description:

These errors indicate that the volume cannot be started because the volume contains no valid complete plexes. This can happen, for example, if disk failures have caused all plexes to be unusable. It can also happen as a result of actions that caused all plexes to become unusable (for example, forcing the dissociation of subdisks or detaching, dissociation, or offlining of plexes).

Recommended action:

It is possible that this error results from a drive that failed to spin up. If so, rebooting may fix the problem. If that does not fix the problem, then the only recourse is to repair the disks involved with the plexes and restore the file system from a backup.

V-5-1-525

`VxVM vxconfigd NOTICE V-5-1-525 Detached log for volume volume`

Description:

The DRL or RAID-5 log for the named volume was detached as a result of a disk failure, or as a result of the administrator removing a disk with `vxdg -k rmdisk`. A failing disk is indicated by a “Detached disk” message.

Recommended action:

If the log is mirrored, hot-relocation tries to relocate the failed log automatically. Use either `vxplex dis` or `vxsd dis` to remove the failing logs. Then, use `vxassist addlog` to add a new log to the volume.

See the `vxassist`(1M) manual page.

V-5-1-526

`VxVM vxconfigd NOTICE V-5-1-526 Detached plex` *`plex`* `in volume` *`volume`*

Description:

The specified plex was disabled as a result of a disk failure, or as a result of the administrator removing a disk with `vxdg -k rmdisk`. A failing disk is indicated by a “Detached disk” message.

Recommended action:

If hot-relocation is enabled, Veritas Volume Manager objects affected by the disk failure are taken care of automatically. Mail is sent to `root` indicating what actions were taken by VxVM and what further actions the administrator should take.

V-5-1-527

`VxVM vxconfigd NOTICE V-5-1-527 Detached subdisk` *`subdisk`* `in volume` *`volume`*

Description:

The specified subdisk was disabled as a result of a disk failure, or as a result of the administrator removing a disk with `vxdg -k rmdisk`. A failing disk is indicated by a “Detached disk” message.

Recommended action:

If hot-relocation is enabled, Veritas Volume Manager objects affected by the disk failure are taken care of automatically. Mail is sent to `root` indicating what actions were taken by VxVM and what further actions the administrator should take.

V-5-1-528

`VxVM vxconfigd NOTICE V-5-1-528 Detached volume` *`volume`*

Description:

The specified volume was detached as a result of a disk failure, or as a result of the administrator removing a disk with `vxdg -k rmdisk`. A failing disk is indicated by a "Detached disk" message. Unless the disk error is transient and can be fixed with a reboot, the contents of the volume should be considered lost.

Recommended action:

Contact Veritas Technical Support.

V-5-1-543

`VxVM vxconfigd ERROR V-5-1-543 Differing version of vxconfigd installed`

Description:

A `vxconfigd` daemon was started after stopping an earlier `vxconfigd` with a non-matching version number. This can happen, for example, if you upgrade VxVM and then run `vxconfigd` without first rebooting.

Recommended action:

Reboot the system.

V-5-1-544

`VxVM vxconfigd WARNING V-5-1-544 Disk` *`disk`* `in group` *`group`* `flagged as shared; Disk skipped`

Description:

The given disk is listed as shared, but the running version of VxVM does not support shared disk groups.

Recommended action:

This message can usually be ignored. If you want to use the disk on this system, use `vxdiskadd` to add the disk. Do not do this if the disk really is shared with other systems.

V-5-1-545

`VxVM vxconfigd WARNING V-5-1-545 Disk` *`disk`* `in group group locked by host` *`hostid`* `Disk skipped`

Description:

The given disk is listed as locked by the host with the Veritas Volume Manager host ID (usually the same as the system host name).

Recommended action:

This message can usually be ignored. If you want to use the disk on this system, use `vxdiskadd` to add the disk. Do not do this if the disk really is shared with other systems.

V-5-1-546

`VxVM vxconfigd WARNING V-5-1-546 Disk disk in group group: Disk device not found`

Description:

No physical disk can be found that matches the named disk in the given disk group. This is equivalent to failure of that disk. (Physical disks are located by matching the disk IDs in the disk group configuration records against the disk IDs stored in the Veritas Volume Manager header on the physical disks.) This error message is displayed for any disk IDs in the configuration that are not located in the disk header of any physical disk. This may result from a transient failure such as a poorly-attached cable, or from a disk that fails to spin up fast enough. Alternately, this may happen as a result of a disk being physically removed from the system, or from a disk that has become unusable due to a head crash or electronics failure.

Any RAID-5 plexes, DRL log plexes, RAID-5 subdisks or mirrored plexes containing subdisks on this disk are unusable. Such disk failures (particularly on multiple disks) may cause one or more volumes to become unusable.

Recommended action:

If hot-relocation is enabled, Veritas Volume Manager objects affected by the disk failure are taken care of automatically. Mail is sent to `root` indicating what actions were taken by VxVM, and what further actions you should take.

V-5-1-554

`VxVM vxconfigd WARNING V-5-1-554 Disk disk names group group, but group ID differs`

Description:

As part of a disk group import, a disk was discovered that had a mismatched disk group name and disk group ID. This disk is not imported. This can only happen if two disk groups have the same name but have different disk group ID values. In such a case, one group is imported along with all its disks and the other group is not. This message appears for disks in the un-selected group.

Recommended action:

If the disks should be imported into the group, this must be done by adding the disk to the group at a later stage, during which all configuration information for the disk is lost.

V-5-1-557

`VxVM vxconfigd ERROR V-5-1-557 Disk disk, group group, device device: not updated with new host ID Error: reason`

Description:

This can result from using `vxdctl hostid hostid` to change the Veritas Volume Manager host ID for the system. The error indicates that one of the disks in a disk group could not be updated with the new host ID. This usually indicates that the disk has become inaccessible or has failed in some other way.

Recommended action:

Try running the following command to determine whether the disk is still operational:

```
# vxdisk check device
```

If the disk is no longer operational, `vxdisk` should print a message such as:

`device: Error: Disk write failure`

This will result in the disk being taken out of active use in its disk group, if it has not already been taken out of use. If the disk is still operational, which should not be the case, `vxdisk` prints:

`device: Okay`

If the disk is listed as "Okay," try running `vxdctl hostid hostid` again. If it still results in an error, contact Veritas Technical Support.

V-5-1-568

`VxVM vxconfigd WARNING V-5-1-568 Disk group group is disabled, disks not updated with new host ID`

Description:

As a result of failures, the named disk group has become disabled. Earlier error messages should indicate the cause. This message indicates that disks in that disk group were not updated with a new Veritas Volume Manager host ID. This warning message should result only from a `vxdctl hostid` operation.

Recommended action:

Typically, unless a disk group was disabled due to transient errors, there is no way to repair a disabled disk group. The disk group may have to be reconstructed from scratch. If the disk group was disabled due to a transient error such as a cabling problem, then a future reboot may not automatically import the named disk group, due to the change in the system's Veritas Volume Manager host ID. In such a case, import the disk group directly using `vxdg import` with the `-C` option.

V-5-1-569

`VxVM vxconfigd ERROR V-5-1-569 Disk group` *`group`*`,Disk` *`disk`*`:Cannot auto-import group: reason`

Description:

On system startup, `vxconfigd` failed to import the disk group associated with the named disk. A message related to the specific failure is given in *reason*. Additional error messages may be displayed that give more information on the specific error. In particular, this is often followed by:

`VxVM vxconfigd ERROR V-5-1-579 Disk group` *`group`*`: Errors in some configuration copies: Disk` *`device`*`, copy` *`number`*`: Block` *`bno`*`:` *`error`* `...`

The most common reason for auto-import failures is excessive numbers of disk failures, making it impossible for VxVM to find correct copies of the disk group configuration database and kernel update log. Disk groups usually have enough copies of this configuration information to make such import failures unlikely.

A more serious failure is indicated by errors such as:

```
Configuration records are inconsistent
Disk group has no valid configuration copies
Duplicate record in configuration
Format error in configuration copy
Invalid block number
Invalid magic number
```

These errors indicate that all configuration copies have become corrupt (due to disk failures, writing on the disk by an application or the administrator, or bugs in VxVM).

Some correctable errors may be indicated by other error messages that appear in conjunction with the auto-import failure message. Look up those other errors for more information on their cause.

Failure of an auto-import implies that the volumes in that disk group will not be available for use. If there are file systems on those volumes, then the system may

yield further errors resulting from inability to access the volume when mounting the file system.

Recommended action:

If the error is clearly caused by excessive disk failures, then you may have to recreate the disk group configuration, and restore the contents of any volumes from a backup.

See "Restoring a disk group configuration" on page 57.

There may be other error messages that appear which provide further information. See those other error messages for more information on how to proceed. If those errors do not make it clear how to proceed, contact Veritas Technical Support.

V-5-1-571

`VxVM vxconfigd ERROR V-5-1-571 Disk group group, Disk disk: Skip disk group with duplicate name`

Description:

Two disk groups with the same name are tagged for auto-importing by the same host. Disk groups are identified both by a simple name and by a long unique identifier (disk group ID) assigned when the disk group is created. Thus, this error indicates that two disks indicate the same disk group name but a different disk group ID.

VxVM does not allow you to create a disk group or import a disk group from another machine, if that would cause a collision with a disk group that is already imported. Therefore, this error is unlikely to occur under normal use.

The error can occur in the following cases:

- A disk group cannot be auto-imported due to some temporary failure. If you create a new disk group with the same name as the failed disk group and reboot, the new disk group is imported first. The auto-import of the older disk group fails because more recently modified disk groups have precedence over older disk groups.
- A disk group is deported from one host using the `-h` option to cause the disk group to be auto-imported on reboot from another host. If the second host was already auto-importing a disk group with the same name, then reboot of that host will yield this error.

Recommended action:

If you want to import both disk groups, then rename the second disk group on import.

See the `vxdg`(1M) manual page.

V-5-1-577

`VxVM vxconfigd WARNING V-5-1-577 Disk group group: Disk group log may be too small Log size should be at least number blocks`

Description:

The log areas for the disk group have become too small for the size of configuration currently in the group. This message only occurs during disk group import; it can only occur if the disk was inaccessible while new database objects were added to the configuration, and the disk was then made accessible and the system restarted. This should not normally happen without first displaying a message about the database area size.

Recommended action:

Reinitialize the disks in the group with larger log areas. Note that this requires that you restore data on the disks from backups.

See the `vxdisk`(1M) manual page.

To reinitialize all of the disks, detach them from the group with which they are associated, reinitialize and re-add them. Then deport and re-import the disk group to effect the changes to the log areas for the group.

V-5-1-579

`VxVM vxconfigd ERROR V-5-1-579 Disk group group: Errors in some configuration copies: Disk disk, copy number: [Block number]: reason...`

Description:

During a failed disk group import, some of the configuration copies in the named disk group were found to have format or other types of errors which make those copies unusable. This message lists all configuration copies that have uncorrected errors, including any appropriate logical block number. If no other reasons are displayed, then this may be the cause of the disk group import failure.

Recommended action:

If some of the copies failed due to transient errors (such as cable failures), then a reboot or re-import may succeed in importing the disk group. Otherwise, the disk group configuration may have to be restored.

See "Restoring a disk group configuration" on page 57.

V-5-1-583

`VxVM vxconfigd ERROR V-5-1-583 Disk group group: Reimport of disk group failed: reason`

Description:

After `vxconfigd` was stopped and restarted (or disabled and then enabled), VxVM failed to recreate the import of the indicated disk group. The reason for failure is specified. Additional error messages may be displayed that give further information describing the problem.

Recommended action:

A major cause for this kind of failure is disk failures that were not addressed before `vxconfigd` was stopped or disabled. If the problem is a transient disk failure, then rebooting may take care of the condition. The error may be accompanied by messages such as “Disk group has no valid configuration copies.” This indicates that the disk group configuration copies have become corrupt (due to disk failures, writing on the disk by an application or the administrator, or bugs in VxVM).

Use the `vxconfigrestore` utility to restore or recreate a disk group from its configuration backup.

See “Restoring a disk group configuration” on page 57.

V-5-1-587

`VxVM vxdg ERROR V-5-1-587 disk group groupname: import failed: reason`

Description:

The import of a disk group failed for the specified reason.

Recommended action:

The action to be taken depends on the reason given in the error message:

`Disk is in use by another host`

`No valid disk found containing disk group`

The first message indicates that disks have been moved from a system that has crashed or that failed to detect the group before the disk was moved. The locks stored on the disks must be cleared.

The second message indicates that the disk group does not contain any valid disks (not that it does not contain any disks). The disks may be considered invalid due to a mismatch between the host ID in their configuration copies and that stored in the `/etc/vx/volboot` file.

To clear locks on a specific set of devices, use the following command:

```
# vxdisk clearimport devicename...
```

To clear the locks during import, use the following command:

```
# vxdg -C import diskgroup
```

Warning: Be careful when using the `vxdisk clearimport` or `vxdg -C import` command on systems that have dual-ported disks. Clearing the locks allows those disks to be accessed at the same time from multiple hosts and can result in corrupted data.

An `import` operation fails if some disks for the disk group cannot be found among the disk drives attached to the system.

```
Disk for disk group not found
```

```
Disk group has no valid configuration copies
```

The first message indicates a recoverable error.

The second message indicates a fatal error that requires hardware repair or the creation of a new disk group, and recovery of the disk group configuration and data:

If some of the disks in the disk group have failed, you can force the disk group to be imported with this command:

```
# vxdg -f import diskgroup
```

Warning: Be careful when using the `-f` option. It can cause the same disk group to be imported twice from different sets of disks. This can cause the disk group configuration to become inconsistent.

As using the `-f` option to force the import of an incomplete disk group counts as a successful import, an incomplete disk group may be imported subsequently without this option being specified. This may not be what you expect.

These operations can also be performed using the `vxdiskadm` utility. To deport a disk group using `vxdiskadm`, select the menu item `Remove access to (deport) a disk group`. To import a disk group, select the menu item `Enable access to (import) a disk group`. The `vxdiskadm import` operation checks for host import locks and prompts to see if you want to clear any that are found. It also starts volumes in the disk group.

V-5-1-663

`VxVM vxconfigd WARNING V-5-1-663 Group group: Duplicate virtual device number(s): Volume volume remapped from major,minor to major,minor ...`

Description:

The configuration of the named disk group includes conflicting device numbers. A disk group configuration lists the recommended device number to use for each volume in the disk group. If two volumes in two disk groups happen to list the same device number, then one of the volumes must use an alternate device number. This is called device number remapping. Remapping is a temporary change to a volume. If the other disk group is deported and the system is rebooted, then the volume that was remapped may no longer be remapped. Also, volumes that are remapped once are not guaranteed to be remapped to the same device number in further reboots.

Recommended action:

Use the `vxdg reminor` command to renumber all volumes in the offending disk group permanently.

See the `vxdg`(1M) manual page.

V-5-1-737

`VxVM vxconfigd ERROR V-5-1-737 Mount point path: volume not in bootdg disk group`

Description:

The volume device listed in the `/etc/fstab` file for the given mount-point directory (normally `/usr`) is listed as in a disk group other than the boot disk group. This error should not occur if the standard Veritas Volume Manager procedures are used for encapsulating the disk containing the `/usr` file system.

Recommended action:

Boot VxVM from a network or CD-ROM mounted root file system. Then, start up VxVM using `fixmountroot` on a valid mirror disk of the root file system. After starting VxVM, mount the `root` file system volume and edit the `/etc/fstab` file. Change the file to use a direct partition for the file system. There should be a comment in the `/etc/fstab` file that indicates which partition to use.

V-5-1-768

`VxVM vxconfigd NOTICE V-5-1-768 Offlining config copy number on diskdisk: Reason: reason`

Description:

An I/O error caused the indicated configuration copy to be disabled. This is a notice only, and does not normally imply serious problems, unless this is the last active configuration copy in the disk group.

Recommended action:

Consider replacing the indicated disk, since this error implies that the disk has deteriorated to the point where write errors cannot be repaired automatically. The error can also result from transient problems with cabling or power.

V-5-1-809

`VxVM vxplex ERROR V-5-1-809 Plex plex in volume volume is locked by another utility.`

Description:

The `vxplex` command fails because a previous operation to attach a plex did not complete. The `vxprint` command should show that one or both of the temporary and persistent utility fields (`TUTIL0` and `PUTIL0`) of the volume and one of its plexes are set.

Recommended action:

If the `vxtask list` command does not show a task running for the volume, use the `vxmend` command to clear the `TUTIL0` and `PUTIL0` fields for the volume and all its components for which these fields are set:

```
# vxmend -g diskgroup clear all volume plex ...
```

V-5-1-923

`VxVM vxplex ERROR V-5-1-923 Record volume is in disk group diskgroup1 plex is in group diskgroup2.`

Description:

An attempt was made to snap back a plex from a different disk group.

Recommended action:

Move the snapshot volume into the same disk group as the original volume.

V-5-1-1049

`VxVM vxconfigd ERROR V-5-1-1049 System boot disk does not have a valid rootvol plex Please boot from one of the following disks:`

```
DISK       MEDIA  DEVICE    BOOT    COMMAND
diskname   device           boot    vx-diskname...
```

Description:

The system is configured to use a volume for the `root` file system, but was not booted on a disk containing a valid mirror of the `root` volume. Disks containing valid `root` mirrors are listed as part of the error message. A disk is usable as a boot disk if there is a `root` mirror on that disk which is not stale or offline.

Recommended action:

Try to boot from one of the named disks using the associated boot command that is listed in the message.

V-5-1-1171

`VxVM vxconfigd ERROR V-5-1-1171 Version number of kernel does not match vxconfigd`

Description:

The release of `vxconfigd` does not match the release of the Veritas Volume Manager kernel drivers. This should happen only as a result of upgrading VxVM, and then running `vxconfigd` without a reboot.

Recommended action:

Reboot the system. If that does not cure the problem, re-add the VxVM packages.

V-5-1-1186

`VxVM vxconfigd ERROR V-5-1-1186 Volume volume for mount point /usr not found in bootdg disk group`

Description:

The system is configured to boot with `/usr` mounted on a volume, but the volume associated with `/usr` is not listed in the configuration of the boot disk group.

The following are possible causes of this error:

- Case 1: The `/etc/fstab` file was erroneously updated to indicate the device for the `/usr` file system is a volume, but the volume named is not in the boot

disk group. This should happen only as a result of direct manipulation by the administrator.

- Case 2: The system somehow has a duplicate boot disk group, one of which contains the `/usr` file system volume and one of which does not (or uses a different volume name), and `vxconfigd` somehow chose the wrong boot disk group. Since `vxconfigd` chooses the more recently accessed version of the boot disk group, this error can happen if the system clock was updated incorrectly at some point (causing the apparent access order of the two disk groups to be reversed). This can also happen if some disk group was deported and assigned the same name as the boot disk group with locks given to this host.

Recommended action:

The following are recommended actions for each case:

- Case 1: Boot the system on a CD-ROM or networking-mounted `root` file system. If the `root` file system is defined on a volume, then start and mount the `root` volume. If the root file system is not defined on a volume, mount the `root` file system directly. Edit the `/etc/fstab` file to correct the entry for the `/usr` file system.
- Case 2: Either boot with all drives in the offending version of the boot disk group turned off, or import and rename the offending boot disk group from another host.
  See the `vxdg`(1M) manual page.
  If you turn off drives, run the following command after booting:

  ```
  # vxdg flush bootdg
  ```

  This updates time stamps on the imported version of the boot disk group, *bootdg*, which should make the correct version appear to be the more recently accessed. If this does not correct the problem, contact Veritas Technical Support.

V-5-1-1589

```
VxVM vxconfigd ERROR V-5-1-1589 enable failed: aborting
```

```
VxVM vxconfigd ERROR V-5-1-1589 enable failed: Error check group
configuration copies. Database file not found
```

```
VxVM vxconfigd ERROR V-5-1-1589 enable failed: transactions are
disabled
```

Description:

Regular startup of `vxconfigd` failed. This error can also result from the command `vxdctl enable`. This message has several variations, described below:

```
VxVM vxconfigd ERROR V-5-1-1589 enable failed: aborting
```

The failure was fatal and `vxconfigd` was forced to exit. The most likely cause is that the operating system is unable to create interprocess communication channels to other utilities.

```
VxVM vxconfigd ERROR V-5-1-1589 enable failed: Error check group
configuration copies. Database file not found
```

The directory `/var/vxvm/tempdb` is inaccessible. This may be because of `root` file system corruption, a full `root` file system, or if `/var` is a separate file system, because it has become corrupted or has not been mounted.

```
VxVM vxconfigd ERROR V-5-1-1589 enable failed: transactions are
disabled
```

`vxconfigd` continues to run, but no configuration updates are possible until the error condition is repaired.

Additionally, this may be followed with this message:

```
VxVM vxconfigd ERROR V-5-1-579 Disk group group: Errors in some
configuration copies: Disk device, copy number: Block bno: error ...
```

Other error messages may be displayed that further indicate the underlying problem.

Recommended action:

```
VxVM vxconfigd ERROR V-5-1-1589 enable failed: aborting
```

The failure was fatal and `vxconfigd` was forced to exit. The most likely cause is that the operating system is unable to create interprocess communication channels to other utilities.

```
VxVM vxconfigd ERROR V-5-1-1589 enable failed: Error check group
configuration copies. Database file not found
```

If the `root` file system is full, increase its size or remove files to make space for the `tempdb` file.

If `/var` is a separate file system, make sure that it has an entry in `/etc/fstab`. Otherwise, look for I/O error messages during the boot process that indicate either a hardware problem or misconfiguration of any logical volume management software being used for the `/var` file system. Also verify that the encapsulation (if configured) of your boot disk is complete and correct.

```
VxVM vxconfigd ERROR V-5-1-1589 enable failed: transactions are
disabled
```

Evaluate the error messages to determine the root cause of the problem. Make changes suggested by the errors and then try rerunning the command.

If the “Errors in some configuration copies” error occurs again, that may indicate the real problem lies with the configuration copies in the disk group.

See “Restoring a disk group configuration” on page 57.

V-5-1-2020

```
VxVM vxconfigd ERROR V-5-1-2020 Cannot kill existing daemon,
pid=process_ID
```

Description:

The `-k` (kill existing `vxconfigd` process) option was specified, but a running configuration daemon process could not be killed. A configuration daemon process, for purposes of this discussion, is any process that opens the `/dev/vx/config` device (only one process can open that device at a time). If there is a configuration daemon process already running, then the `-k` option causes a `SIGKILL` signal to be sent to that process. If, within a certain period of time, there is still a running configuration daemon process, the error message is displayed.

Recommended action:

This error can result from a kernel error that has made the configuration daemon process unkillable, from some other kind of kernel error, or from some other user starting another configuration daemon process after the `SIGKILL` signal. This last condition can be tested for by running `vxconfigd -k` again. If the error message reappears, contact Veritas Technical Support.

V-5-1-2197

```
VxVM vxconfigd ERROR V-5-1-2197 node N: missing vxconfigd
```

Description:

The `vxconfigd` daemon is not running on the indicated cluster node.

Recommended action:

Restart the `vxconfigd` daemon.

V-5-1-2198

```
VxVM vxconfigd ERROR V-5-1-2198 node N: vxconfigd not ready
```

Description:

The `vxconfigd` daemon is not responding properly in a cluster.

Recommended action:

Stop and restart the `vxconfigd` daemon on the node indicated.

V-5-1-2274

`VxVM vxconfigd ERROR V-5-1-2274 volume:vxconfigd cannot boot-start RAID-5 volumes`

Description:

A volume that `vxconfigd` should start immediately upon booting the system (that is, the volume for the `/usr` file system) has a RAID-5 layout. The `/usr` file system should never be defined on a RAID-5 volume.

Recommended action:

It is likely that the only recovery for this is to boot VxVM from a network-mounted root file system (or from a CD-ROM), and reconfigure the `/usr` file system to be defined on a regular non-RAID-5 volume.

V-5-1-2290

`VxVM vxdmpadm ERROR V-5-1-2290 Attempt to enable a controller that is not available`

Description:

This message is returned by the `vxdmpadm` utility when an attempt is made to enable a controller that is not working or is not physically present.

Recommended action:

Check hardware and see if the controller is present and whether I/O can be performed through it.

V-5-1-2353

`VxVM vxconfigd ERROR V-5-1-2353 Disk group group: Cannot recover temp database: reasonConsider use of "vxconfigd -x cleartempdir" [see vxconfigd(1M)].`

Description:

This error can happen if you kill and restart `vxconfigd`, or if you disable and enable `vxconfigd` with `vxdctl disable` and `vxdctl enable`. The error indicates

a failure related to reading the file `/var/vxvm/tempdb/group`. This is a temporary file used to store information that is used when recovering the state of an earlier `vxconfigd`. The file is recreated on a reboot, so this error should never survive a reboot.

Recommended action:

If you can reboot the system, do so. If you do not want to reboot, then use the following procedure.

To correct the error without rebooting

1. Ensure that no `vxvol`, `vxplex`, or `vxsd` processes are running.

   Use `ps -e` to search for such processes, and use `kill` to kill any that you find. You may have to run `kill` twice to make these processes go away. Killing utilities in this way may make it difficult to make administrative changes to some volumes until the system is rebooted.

2. Recreate the temporary database files for all imported disk groups using the following command:

   ```
   # vxconfigd -x cleartempdir 2> /dev/console
   ```

   The `vxvol`, `vxplex`, and `vxsd` commands make use of these `tempdb` files to communicate locking information. If the file is cleared, then locking information can be lost. Without this locking information, two utilities can end up making incompatible changes to the configuration of a volume.

V-5-1-2524

`VxVM vxconfigd ERROR V-5-1:2524 VOL_IO_DAEMON_SET failed: daemon count must be above N while cluster`

Description:

The number of Veritas Volume Manager kernel daemons (`vxiod`) is less than the minimum number needed to join a cluster.

Recommended action:

Increase the number of daemons using `vxiod`.

V-5-1-2630

`VxVM vxconfigd WARNING V-5-1-2630 library and vxconfigd disagree on existence of client number`

Description:

This warning may safely be ignored.

Recommended action:

No recovery procedure is required.

V-5-1-2824

`VxVM vxconfigd ERROR V-5-1-2824 Configuration daemon error 242`

Description:

A node failed to join a cluster, or a cluster join is taking too long. If the join fails, the node retries the join automatically.

Recommended action:

No action is necessary if the join is slow or a retry eventually succeeds.

V-5-1-2829

`VxVM vxdg ERROR V-5-1-2829 diskgroup: Disk group version doesn't support feature; see the vxdg upgrade command`

Description:

The version of the specified disk group does not support disk group move, split or join operations.

Recommended action:

Use the `vxdg upgrade diskgroup` command to update the disk group version.

V-5-1-2830

`VxVM vxconfigd ERROR V-5-1-2830 Disk reserved by other host`

Description:

An attempt was made to online a disk whose controller has been reserved by another host in the cluster.

Recommended action:

No action is necessary. The cluster manager frees the disk and VxVM puts it online when the node joins the cluster.

V-5-1-2860

`VxVM vxdg ERROR V-5-1-2860 Transaction already in progress`

Description:

One of the disk groups specified in a disk group move, split or join operation is currently involved in another unrelated disk group move, split or join operation (possibly as the result of recovery from a system failure).

Recommended action:

Use the `vxprint` command to display the status of the disk groups involved. If `vxprint` shows that the TUTIL0 field for a disk group is set to MOVE, and you are certain that no disk group move, split or join should be in progress, use the `vxdg` command to clear the field.

See "Recovering from an incomplete disk group move" on page 27.

Otherwise, retry the operation.

V-5-1-2862

`VxVM vxdg ERROR V-5-1-2862 object: Operation is not supported`

Description:

DCO and snap objects dissociated by Persistent FastResync, and VVR objects cannot be moved between disk groups.

Recommended action:

No action is necessary. The operation is not supported.

V-5-1-2866

`VxVM vxdg ERROR V-5-1-2866 object: Record already exists in disk group`

Description:

A disk group join operation failed because the name of an object in one disk group is the same as the name of an object in the other disk group. Such name clashes are most likely to occur for snap objects and snapshot plexes.

Recommended action:

Use the following command to change the object name in either one of the disk groups:

```
# vxedit -g diskgroup rename old_name new_name
```

See the `vxedit`(1M) manual page.

V-5-1-2870

`VxVM vxdg ERROR V-5-1-2870 volume: Volume or plex device is open or mounted`

Description:

An attempt was made to perform a disk group move, split or join on a disk group containing an open volume.

Recommended action:

It is most likely that a file system configured on the volume is still mounted. Stop applications that access volumes configured in the disk group, and unmount any file systems configured in the volumes.

V-5-1-2879

`VxVM vxdg ERROR V-5-1-2879 subdisk: Record is associated`

Description:

The named subdisk is not a top-level object.

Recommended action:

Objects specified for a disk group move, split or join must be either disks or top-level volumes.

V-5-1-2907

`VxVM vxdg ERROR V-5-1-2907 diskgroup: Disk group does not exist`

Description:

The disk group does not exist or is not imported

Recommended action:

Use the correct name, or import the disk group and try again.

V-5-1-2908

`VxVM vxdg ERROR V-5-1-2908 diskdevice: Request crosses disk group boundary`

Description:

The specified disk device is not configured in the source disk group for a disk group move or split operation.

Recommended action:

Correct the name of the disk object specified in the disk group move or split operation.

V-5-1-2911

`VxVM vxdg ERROR V-5-1-2911 diskname: Disk is not usable`

Description:

The specified disk has become unusable.

Recommended action:

Do not include the disk in any disk group move, split or join operation until it has been replaced or repaired.

V-5-1-2922

`VxVM vxconfigd ERROR V-5-1-2922 Disk group exists and is imported`

Description:

A slave tried to join a cluster, but a shared disk group already exists in the cluster with the same name as one of its private disk groups.

Recommended action:

Use the `vxdg -n newname import diskgroup` operation to rename either the shared disk group on the master, or the private disk group on the slave.

V-5-1-2928

`VxVM vxdg ERROR V-5-1-2928 diskgroup: Configuration too large for configuration copies`

Description:

The disk group's configuration database is too small to hold the expanded configuration after a disk group move or join operation.

Recommended action:

No action is required.

V-5-1-2933

`VxVM vxdg ERROR V-5-1-2933 diskgroup: Cannot remove last disk group configuration copy`

Description:

The requested disk group move, split or join operation would leave the disk group without any configuration copies.

Recommended action:

No action is required. The operation is not supported.

V-5-1-2935

`VxVM vxassist ERROR V-5-1-2935 No more space in disk group configuration.`

Description:

There is no more space in the disk group's configuration database for VxVM object records.

Recommended action:

Copy the contents of several volumes to another disk group and then delete the volumes from this disk group, or use the disk group split/join feature to move the volumes to another disk group. To avoid the problem in the future, do not create more than a few hundred volumes in a disk group, or specify a larger size for the private region when adding disks to a new disk group.

V-5-1-3009

`VxVM vxdg ERROR V-5-1-3009 object: Name conflicts with imported diskgroup`

Description:

The target disk group of a split operation already exists as an imported disk group.

Recommended action:

Choose a different name for the target disk group.

V-5-1-3020

`VxVM vxconfigd ERROR V-5-1-3020 Error in cluster processing`

Description:

This may be due to an operation inconsistent with the current state of a cluster (such as an attempt to import or deport a shared disk group to or from the slave). It may also be caused by an unexpected sequence of commands from `vxclust`.

Recommended action:

Perform the operation from the master node.

V-5-1-3022

`VxVM vxconfigd ERROR V-5-1-3022 Cannot find disk on slave node`

Description:

A slave node in a cluster cannot find a shared disk. This is accompanied by the `syslog` message:

`VxVM vxconfigd ERROR V-5-1-2173 cannot find disk` *`disk`*

Recommended action:

Make sure that the same set of shared disks is online on both nodes. Examine the disks on both the master and the slave with the command `vxdisk list` and make sure that the same set of disks with the `shared` flag is visible on both nodes. If not, check the connections to the disks.

V-5-1-3023

`VxVM vxconfigd ERROR V-5-1-3023 Disk in use by another cluster`

Description:

An attempt was made to import a disk group whose disks are stamped with the ID of another cluster.

Recommended action:

If the disk group is not imported by another cluster, retry the import using the `-C` (clear import) flag.

V-5-1-3024

`VxVM vxconfigd ERROR V-5-1-3024 vxclust not there`

Description:

An error during an attempt to join a cluster caused `vxclust` to fail. This may be caused by the failure of another node during a join or by the failure of `vxclust`.

Recommended action:

Retry the join. An error message on the other node may clarify the problem.

V-5-1-3025

`VxVM vxconfigd ERROR V-5-1-3025 Unable to add portal for cluster`

Description:

`vxconfigd` was not able to create a portal for communication with the `vxconfigd` on the other node. This may happen in a degraded system that is experiencing shortages of system resources such as memory or file descriptors.

Recommended action:

If the system does not appear to be degraded, stop and restart `vxconfigd`, and try again.

V-5-1-3030

`VxVM vxconfigd ERROR V-5-1-3030 Volume recovery in progress`

Description:

A node that crashed attempted to rejoin the cluster before its DRL map was merged into the recovery map.

Recommended action:

Retry the join when the merge operation has completed.

V-5-1-3031

`VxVM vxconfigd ERROR V-5-1-3031 Cannot assign minor` *`minor`*

Description:

A slave attempted to join a cluster, but an existing volume on the slave has the same minor number as a shared volume on the master.

This message is accompanied by the following console message:

`VxVM vxconfigd ERROR V-5-1-2192 minor number` *`minor`* `disk group`*`group`* `in use`

Recommended action:

Before retrying the join, use `vxdg reminor` (see the `vxdg`(1M) manual page) to choose a new minor number range either for the disk group on the master or for the conflicting disk group on the slave. If there are open volumes in the disk group, the reminor operation will not take effect until the disk group is deported and updated (either explicitly or by rebooting the system).

V-5-1-3032

`VxVM vxconfigd ERROR V-5-1-3032 Master sent no data`

Description:

During the slave join protocol, a message without data was received from the master. This message is only likely to be seen in the case of an internal VxVM error.

Recommended action:

Contact Veritas Technical Support.

V-5-1-3033

```
VxVM vxconfigd ERROR V-5-1-3033 Join in progress
```

Description:

An attempt was made to import or deport a shared disk group during a cluster reconfiguration.

Recommended action:

Retry when the cluster reconfiguration has completed.

V-5-1-3034

```
VxVM vxconfigd ERROR V-5-1-3034 Join not currently allowed
```

Description:

A slave attempted to join a cluster when the master was not ready. The slave will retry automatically.

Recommended action:

No action is necessary if the join eventually completes. Otherwise, investigate the cluster monitor on the master.

V-5-1-3042

```
VxVM vxconfigd ERROR V-5-1-3042 Clustering license restricts operation
```

Description:

An operation requiring a full clustering license was attempted, and such a license is not available.

Recommended action:

If the error occurs when a disk group is being activated, dissociate all but one plex from mirrored volumes before activating the disk group. If the error occurs during a transaction, deactivate the disk group on all nodes except the master.

V-5-1-3046

`VxVM vxconfigd ERROR V-5-1-3046 Node activation conflict`

Description:

The disk group could not be activated because it is activated in a conflicting mode on another node in a cluster.

Recommended action:

Retry later, or deactivate the disk group on conflicting nodes.

V-5-1-3049

`VxVM vxconfigd ERROR V-5-1-3049 Retry rolling upgrade`

Description:

An attempt was made to upgrade a cluster to a higher protocol version when a transaction was in progress.

Recommended action:

Retry the upgrade at a later time.

V-5-1-3050

`VxVM vxconfigd ERROR V-5-1-3050 Version out of range for at least one node`

Description:

Before trying to upgrade a cluster by running `vxdctl upgrade`, all nodes should be able to support the new protocol version. An upgrade can fail if at least one of them does not support the new protocol version.

Recommended action:

Make sure that the Veritas Volume Manager package that supports the new protocol version is installed on all nodes and retry the upgrade.

V-5-1-3091

`VxVM vxdg ERROR V-5-1-3091` *`diskname`* `: Disk not moving, but subdisks on it are`

Description:

Some volumes have subdisks that are not on the disks implied by the supplied list of objects.

Recommended action:

Use the `-o expand` option to `vxdg listmove` to produce a self-contained list of objects.

V-5-1-3212

```
VxVM vxconfigd ERROR V-5-1-3212 Insufficient DRL log size: logging
is disabled.
```

Description:

A volume with an insufficient DRL log size was started successfully, but DRL logging is disabled and a full recovery is performed.

Recommended action:

Create a new DRL of sufficient size.

V-5-1-3243

```
VxVM vxdmpadm ERROR V-5-1-3243 The VxVM restore daemon is already
running. You can stop and restart the restore daemon with desired
arguments for changing any of its parameters.
```

Description:

The `vxdmpadm start restore` command has been executed while the restore daemon is already running.

Recommended action:

Stop the restore daemon and restart it with the required set of parameters.

See the `vxdmpadm`(1M) manual page.

V-5-1-3362

```
VxVM vxdmpadm ERROR V-5-1-3362 Attempt to disable controller failed.
One (or more) devices can be accessed only through this controller.
Use the -f option if you still want to disable this controller.
```

Description:

Disabling the controller could lead to some devices becoming inaccessible.

Recommended action:

To disable the only path connected to a disk, use the `-f` option.

V-5-1-3486

```
VxVM vxconfigd ERROR V-5-1-3486 Not in cluster
```

Description:

Checking for the current protocol version (using `vxdctl protocol version`) does not work if the node is not in a cluster.

Recommended action:

Bring the node into the cluster and retry.

V-5-1-3689

`VxVM vxassist ERROR V-5-1-3689 Volume record id` *`rid`* `is not found in the configuration.`

Description:

An error was detected while reattaching a snapshot volume using `snapback`. This happens if a volume's record identifier (rid) changes as a result of a disk group split that moved the original volume to a new disk group. The snapshot volume is unable to recognize the original volume because its record identifier has changed.

Recommended action:

Use the following command to perform the snapback:

```
# vxplex [-g diskgroup] -f snapback volume plex
```

V-5-1-3828

`VxVM vxconfigd ERROR V-5-1-3828 upgrade operation failed: Already at highest version`

Description:

An upgrade operation has failed because a cluster is already running at the highest protocol version supported by the master.

Recommended action:

No further action is possible as the master is already running at the highest protocol version it can support.

V-5-1-3848

`VxVM vxconfigd ERROR V-5-1-3848 Incorrect protocol version (`*`number`*`) in volboot file`

Description:

A node attempted to join a cluster where VxVM software was incorrectly upgraded or the `volboot` file is corrupted, possibly by being edited manually. The `volboot`

file should contain a supported protocol version before trying to bring the node into the cluster.

Recommended action:

Verify the supported cluster protocol versions using the `vxdctl protocolversion` command. The `volboot` file should contain a supported protocol version before trying to bring the node into the cluster. Run `vxdctl init` to write a valid protocol version to the `volboot` file. Restart `vxconfigd` and retry the join.

V-5-1-4220

`VxVM vxconfigd ERROR V-5-1-4220 DG move: can't import diskgroup, giving up`

Description:

The specified disk group cannot be imported during a disk group move operation. (The disk group ID is obtained from the disk group that could be imported.)

Recommended action:

The disk group may have been moved to another host. One option is to locate it and use the `vxdg recover` command on both the source and target disk groups. Specify the `-o clean` option with one disk group, and the `-o remove` option with the other disk group.

See "Recovering from an incomplete disk group move" on page 27.

V-5-1-4267

`VxVM vxassist WARNING V-5-1-4267 volume` *`volume`* `already has at least one snapshot plex Snapshot volume created with these plexes will have a dco volume with no associated dco plex.`

Description:

An error was detected while adding a DCO object and DCO volume to a mirrored volume. There is at least one snapshot plex already created on the volume. Because this snapshot plex was created when no DCO was associated with the volume, there is no DCO plex allocated for it.

Recommended action:

For information on adding DCO volumes and volume snapshots, see the *Veritas Volume Manager Administrator's Guide.*

V-5-1-4277

`VxVM vxconfigd ERROR V-5-1-4277 cluster_establish: CVM protocol version out of range`

Description:

When a node joins a cluster, it tries to join at the protocol version that is stored in its `volboot` file. If the cluster is running at a different protocol version, the master rejects the join and sends the current protocol version to the slave. The slave re-tries with the current version (if that version is supported on the joining node), or the join fails.

Recommended action:

Make sure that the joining node has a Veritas Volume Manager release installed that supports the current protocol version of the cluster.

V-5-1-4551

`VxVM vxconfigd ERROR V-5-1-4551 dg_move_recover: can't locate disk(s), giving up`

Description:

Disks involved in a disk group move operation cannot be found, and one of the specified disk groups cannot be imported.

Recommended action:

Manual use of the `vxdg recover` command may be required to clean the disk group to be imported.

See "Recovering from an incomplete disk group move" on page 27.

V-5-1-4620

`VxVM vxassist WARNING V-5-1-4620 Error while retrieving information from SAL`

Description:

The `vxassist` command does not recognize the version of the SAN Access Layer (SAL) that is being used, or detects an error in the output from SAL.

Recommended action:

If a connection to SAL is desired, ensure that the correct version of SAL is installed and configured correctly. Otherwise, suppress communication between `vxassist` and SAL by adding the following line to the `vxassist` defaults file (usually `/etc/default/vxassist`):

```
salcontact=no
```

V-5-1-4625

```
VxVM vxassist WARNING V-5-1-4625 SAL authentication failed...
```

Description:

The SAN Access Layer (SAL) rejects the credentials that are supplied by the `vxassist` command.

Recommended action:

If connection to SAL is desired, use the `vxspcshow` command to set a valid user name and password. Otherwise, suppress communication between `vxassist` and SAL by adding the following line to the `vxassist` defaults file (usually `/etc/default/vxassist`):

```
salcontact=no
```

V-5-1-5150

```
VxVM vxassist ERROR V-5-1-5150 Insufficient number of active snapshot
mirrors in snapshot_volume.
```

Description:

An attempt to snap back a specified number of snapshot mirrors to their original volume failed.

Recommended action:

Specify a number of snapshot mirrors less than or equal to the number in the snapshot volume.

V-5-1-5160

```
VxVM vxplex ERROR V-5-1-5160 Plex plex not associated to a snapshot
volume.
```

Description:

An attempt was made to snap back a plex that is not from a snapshot volume.

Recommended action:

Specify a plex from a snapshot volume.

V-5-1-5161

```
VxVM vxplex ERROR V-5-1-5161 Plex plex not attached.
```

Description:

An attempt was made to snap back a detached plex.

Recommended action:

Reattach the snapshot plex to the snapshot volume.

V-5-1-5162

`VxVM vxplex ERROR V-5-1-5162 Plexes do not belong to the same snapshot volume.`

Description:

An attempt was made to snap back plexes that belong to different snapshot volumes.

Recommended action:

Specify the plexes in separate invocations of `vxplex snapback`.

V-5-1-5929

`VxVM vxconfigd NOTICE V-5-1-5929 Unable to resolve duplicate diskid.`

Description:

VxVM has detected disks with duplicate disk identifiers. Arrays with mirroring capability in hardware are particularly susceptible to such data corruption, but other causes are possible as explained below.

In releases prior to 3.5, VxVM selected the first disk that it found if the selection process failed. From release 3.5, the default behavior of VxVM was to avoid the selection of the wrong disk as this could lead to data corruption.

If VxVM could not determine which disk was the original, it would not import the disks until they were reinitialized with a new disk ID.

From release 5.0, VxVM checks the unique disk identifier (UDID) value that is known to the Device Discovery Layer (DDL) against the UDID value that is set in the disk's private region. The `udid_mismatch` flag is set on the disk if the values differ. If set, this flag is displayed in the output from the `vxdisk list` command.

A new set of `vxdisk` and `vxdg` operations are provided to handle such disks; either by writing the DDL value of the UDID to a disk's private region, or by tagging a disk and specifying that it is a cloned disk to the `vxdg import` operation.

Recommended action:

User intervention is required in the following cases:

- Case 1: Some arrays such as EMC and HDS provide mirroring in hardware. When a LUN pair is split, depending on how the process is performed, this can result in two disks that have the same disk identifier and UDID value. See "Handling Disks with Duplicated Identifiers" in the "Creating and Administering Disk Groups" chapter of the *Veritas Volume Manager Administrator's Guide* for full details of how to deal with this condition.
- Case 2: If disks have been duplicated by using the `dd` command or any similar copying utility, you can use the following command to update the UDID for one or more disks:

  ```
  # vxdisk [-f] updateudid disk1 ...
  ```

  This command uses the current value of the UDID that is stored in the Device Discovery Layer (DDL) database to correct the value in the private region. The `-f` option must be specified if VxVM has not set the `udid_mismatch` flag on a disk.
  For example, the following command updates the UDIDs for the disks `c2t66d0` and `c2t67d0`:

  ```
  # vxdisk updateudid c2t66d0 c2t67d0
  ```

- Case 3: If DMP has been disabled to an array that has multiple paths, then each path to the array is claimed as a unique disk.
  If DMP is suppressed, VxVM does not know which path to select as the true path. You must choose which path to use. Decide which path to exclude, and then select item 1 (`suppress all paths through a controller from VxVM's view`) or item 2 (`suppress a path from VxVM's view`) from `vxdiskadm` option 17 (`Prevent multipathing/Suppress devices from VxVM's view`).

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