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Mirroring the rootvg Volume Group for AIX 3.1 or 3.2

Special Notices

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> **Note:** The information in this document is **not** applicable for AIX 4.1.

Procedure

About This Document

This document describes how to mirror the rootvg volume group to create a redundant volume group for the purpose of booting in case of a system crash.

Mirroring the root volume group is a complex procedure, requiring a significant level of AIX knowledge, and extreme care in maintaining the consistency of the mirrored copy. For these reasons, IBM does NOT recommend mirroring rootvg in AIX 3.1 or 3.2.

Warning: Please do not use this document if the system is a /usr client, diskless client, or dataless client.

This document describes how to mirror the rootvg volume group to create a redundant volume group for the purpose of booting in case of a system crash.

Mirroring rootvg in AIX 31 or 32 is not officially supported.

About Mirroring

Mirroring allows your system to remain available in the event of a disk failure and will even allow an automatic boot from an alternate disk drive if necessary. The following example assumes that the operating system was installed on hdisk0 and you are mirroring onto hdisk1; if this isn't the case, substitute the names of your disks for hdisk0 and hdisk1 in the following example.

Notes:

1. Having "high availability" in the case of mirroring reduces the performance of the machine.
2. It is best for the mirrored disk to be on another SCSI controller.

Disclaimer: IBM does not take responsibility for this procedure, although it has been verified. It is always recommended that a full-system backup (mksysb, smit startup, or backup) be performed prior to doing any disk-reorganization procedure.

1. Extend rootvg to hdisk1:

   ```
   extendvg rootvg hdisk1
   ```

2. If the rootvg is on two disks and both of them are mirrored, QUORUM must be disabled so that the volume group will be varied on if one of the disks goes down.

   Note: This can only be done on AIX levels 3.2.3e and above. If the level of the AIX operating system is from before 3.2.3e, skip this step.

   To disable QUORUM, run the following:

   ```
   chvg -Qn rootvg
   ```

WARNING: Please do not proceed further if the system is a /usr client, diskless client, or dataless client.

3. Create a **new** boot logical volume:

   ```
   mklv -y hd5x -t boot -a e rootvg 2 hdisk1
   ```

4. Edit the /etc/filesystems file and add the following stanza to the bottom of the file:

   ```
   /blv:
           dev           = /dev/hd5x
           vol           = "spare"
           mount         = false
           check         = false
           free          = false
           vfs           = jfs
           log           = /dev/hd8
   ```

5. Update the new boot logical volume:

   ```
   bosboot -a -l /dev/hd5x -d /dev/hdisk1
   ```

6. Update NVRAM with a new list of disks from which to attempt to IPL:

   ```
   bootlist -m normal hdisk0 hdisk1
   ```

   Note: The bosboot and bootlist commands need to be executed on **both** boot images after **any** command is run that updates the ODM. Failure to do so could result in serious problems when booting from the mirrored copy. The most common commands which modify ODM are those which:

   - Add/change/delete system/device configuration

- Add/change/delete logical volumes or volume groups (even volume groups other than rootvg)
- Install or update software

7. Create a mirrored copy of all the file systems, the file system log, and the paging space on hdisk1:

```
mklvcopy hd1 2 hdisk1            #  /u file system
mklvcopy hd2 2 hdisk1            #  /usr file system
mklvcopy hd3 2 hdisk1            #  /tmp file system
mklvcopy hd4 2 hdisk1            #  / (root) file system
mklvcopy hd6 2 hdisk1            #  paging space
mklvcopy hd8 2 hdisk1            #  file system log
```

   For 3.2 only:

```
mklvcopy hd9var 2 hdisk1         #  /var file system
```

8. Create a NEW system dump device on the second disk, and set the device to be the secondary dump device:

```
mklv -y hd7x -t sysdump -a e rootvg 2 hdisk1
sysdumpdev -P -s /dev/hd7x
```

9. Synchronize (update) all the new copies (mirrored copies) created: (NOTE: This takes a while.)

```
syncvg -v rootvg
```

10. reboot the system

```
shutdown -Fr
```

Switching Back to the Primary Disk

Warning Do not attempt to reintegrate a disk containing rootvg mirrors that was previously removed from rootvg. This disk will appear to be a valid, but will have a different copy of the VDGA. Reintergrating can cause unpredictable results.

If you have booted from a mirror but later corrected the primary disk, brought down the system, and connected the primary back to boot from it again, you may get the following errors during reboot:

```
0516-068: lresynclp: Unable to completely resynchronize...
0516-932: /etc/syncvg: unable to synchronize volume group...
```

The system will, however, proceed to boot.

Now, when the system is up, you will see (with "lsvg -p rootvg") that the primary shows up as "removed" while the secondary shows up as "active". Other problems you will encounter are an inability to create logical volumes on the primary, "lsvg -l rootvg" showing most LVs as "stale", "lsdev -Cc disk" showing the primary as "Available" but "lspv <primary_hdisk>" showing it as "removed".

All this is because /dev/ipldevice is still pointing to the secondary (the previous boot disk). To make the primary available again, you need to do the following (before you boot from the primary):

1. Open the primary physical volume for logical and physical output:

   ```
   chpv -va <primary_hdisk>
   ```

2. Synchronize the logical volume copies that are not current.

   ```
   syncvg -v rootvg
   ```

The same needs to be done for the secondary if you have booted from the primary and now want to boot from the secondary.

If the replacement of a failed mirrored rootvg disk causes symptoms other than those previously described, restoring a mksysb backup has proven to be the fastest, most reliable method of recovering rootvg.

Reader's Comments

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