CONVERSANT® System

Version 8.0 and Release 9.0

Using mkimage with a Mirrored MAP/40P System

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Acknowledgment
This document was written by the CRM Information Development group.

Contents

Overview

The process of creating and restoring a MAP/40P backup with systems using disk mirroring requires the following:

- You are using the MAP/40P platform.
- You are using disk mirroring.
- You are using the **mkimage** command to create system backups.
- You have and are familiar with the CONVERSANT system and its documentation.

You also must have downloaded and installed the appropriate patch on your system, as identified in the following table:

System configuration	Patch
Version 8.0	mtce+Np1
Version 8.0 with Remote Field Update A (RFU+A)	mtce+ap1
Release 9.0	mtce+ap1

Note:
These patches can be downloaded from the Avaya support Web site (http://support.avaya.com).

Background

The patch makes it possible for you to disable mirroring prior to using the **mkimage** command to back up your system. Without mirroring disabled, **mkimage** creates an invalid backup that cannot be restored. Additionally, the patch allows you to re-establish mirroring after the **mkimage** backup has been created.

Document organization

This document has the following sections:

- Creating a **mkimage** backup with a mirrored system

- Re-establishing mirroring for a restored system
- Quick Reference

Creating a mkimage backup with a mirrored system on page 9 describes preparing and creating a backup, creating a standard **mkimage** backup, and re-establishing mirroring after you have created the backup.

Re-establishing mirroring for a restored system on page 19 describes how to re-establish mirroring after you have restored the system from a **mkimage** backup.

The *Quick Reference* on page 27 lists the commands used in the other sections of the document. You can use this information if you are already familiar with the procedures.

Related documents

This document refers to backup and restore procedures in *CONVERSANT System Version 8.0 System Reference, 585-313-215.*

Creating a mkimage backup with a mirrored system

Creating a **mkimage** backup involves the following steps:

1. Removing mirror images
2. Converting root, stand, and swap volumes to partitions
3. Backing up the system to tape
4. Converting partitions back to volumes
5. Re-establishing mirrored volumes

These steps are detailed in the following procedures.

Removing mirror images

1. Log in as root.
2. Type **stop_vs** and press **Enter**.

   The voice system stops and displays a new prompt.
3. Type **/mtce/bin/mirrorvexvol** and press **Enter**.

   The system displays a list of volumes similar to the following:

```
 appl 2
fax 2
mtce 2
oracle 2
rootdisk6vol 2
rootvol 2
standvol 2
support 2
swapvol 2
tmp 2
unused1 2
voice1 2
vs 2
```

   This command displays the number of mirror images that exist for each volume. The system should show a *2* for each volume in the list it displays.
4. Type **/mtce/bin/rmvolmirr** and press **Enter**.

```
Choose a Volume Name from the following list:


        ALL appl fax mtce oracle rootdisk6vol rootvol standvol
support swapvol tmp unused1 voice1 vs


Enter Volume Name or ALL:
```

   The system prompts you for the volumes whose mirror images you want to remove from the second drive.
5. Type **ALL** and press **Enter**.

   The system displays messages indicating that it is removing the mirror images from the second drive.
6. Type **/mtce/bin/mirrorvexvol** and press **Enter**.

```
appl 1
fax 1
mtce 1
oracle 1
rootdisk6vol 1
rootvol 1
standvol 1
support 1
swapvol 1
tmp 1
unused1 1
voice1 1
vs 1
```

The system should show a *1* for each volume in the list it displays.

7. Proceed to Converting volumes to partitions on page 12.

Converting volumes to partitions

1. Type **/etc/vx/bin/vxunroot** and press **Enter**.

   The system displays the following:

   ```
   This operation will require a system reboot.  If you choose to
   continue with this operation, your kernel will be updated to
   discontinue use of the Volume Manager for your root and swap
   devices.

   Do you wish to do this now [y,n,q,?] (default: y)
   ```

2. Press **Enter** to select the default response.

   The system converts the root, stand, and swap volumes into partitions, displaying the following:

   ```
   Restoring kernel configuration...
   46 blocks
   UX:idbuild: INFO:
           The unix kernel will be rebuilt now.
           This will take some time. Please wait.
   UX:idbuild: INFO: The unix kernel has been rebuilt.
   UX:idcpunix: INFO: Saved the previous UNIX Operating System
   kernel as unix.old.
   UX:idcpunix: INFO: Installed new UNIX Operating System kernel.


    A shutdown is now required to install the new kernel.
    After exiting the utility, use shutdown -g0 -i6 -y to
    shutdown the machine, at your convenience.
   ```

3. Type **shutdown -g0 -i6 -y** and press **Enter**.

   The system shuts down and boots itself.

4. When the system displays the console login prompt, proceed to Backing up the system to tape on page 13.

Backing up the system to tape

1. Log in as root.
2. Type **stop_vs** and press **Enter**.

   The voice system stops.
3. Type **mkimage** and press **Enter**.

   The system displays the following message:

```
UX:idbuild: INFO:
The unix kernel will be rebuilt now.
This will take some time. Please wait.

UX:idbuild: INFO: The unix kernel has been rebuilt.

CHECKING THE SYSTEM RUN LEVEL: PLEASE WAIT.....

************************************************************
WARNING: This process will put the system in single user mode!!!
************************************************************
Do you wish to continue (y/n)?
```

4. Type **y** and press **Enter**.

   The system displays the following message:

```
STOPPING THE ORACLE DATABASE: PLEASE WAIT......

THE SYSTEM WILL NOW BE PUT INTO SINGLE USER MODE.
RE-LOGIN AFTER THE PROMPT AND RE-EXECUTE THIS COMMAND
TO CONTINUE THE MKIMAGE PROCESS.

Console Login:
```

5. Log in as root.
6. Perform a standard backup using the **mkimage** command, as detailed in the section "Backing Up the System Using mkimage" in *CONVERSANT System Version 8.0 System Reference, 585-313-215*.

   The system boots automatically after the backup is created.
7. When the system displays the console login prompt, proceed to Converting partitions to volumes on page 14.

Converting partitions to volumes

1. Log in as root.
2. Type **/etc/vx/bin/vxroot rootdisk** and press **Enter**.

   The Volume Manager sets up your boot disk as a managed disk.

   Note:
   During this operation, the system displays the block counts of completed copy operations. You can ignore these counts unless they are accompanied by some error and the operation aborts.

   The system displays the following:

```
Saving original configuration...
46 blocks
0 blocks
0 blocks
Generating new configuration...
Writing new configuration...
42 blocks
The kernel will now be rebuilt to incorporate configuration
changes for the Volume Manager.
UX:idbuild: INFO:
        The unix kernel will be rebuilt now.
        This will take some time. Please wait.

UX:idbuild: INFO: The unix kernel has been rebuilt.
UX:idcpunix: INFO: Saved the previous UNIX Operating System kernel
as unix.old.
UX:idcpunix: INFO: Installed new UNIX Operating System kernel
```

3. Type **shutdown –i6 –g0 -y** and press **Enter**.

   The system shuts down and boots itself.

4. When the system displays the console login prompt, proceed to Re-establishing mirrored volumes on page 15.

Re-establishing mirrored volumes

1. Log in as root.
2. Type **vxdiskadm** and press **Enter**.

   The system displays the following:

```
Volume Manager Support Operations
Menu: VolumeManager/Disk

1      Add or initialize one or more disks
 2      Encapsulate one or more disks
 3      Remove a disk
 4      Remove a disk for replacement
 5      Replace a failed or removed disk
 6      Mirror volumes on a disk
 7      Move volumes from a disk
 8      Enable access to (import) a disk group
 9      Remove access to (deport) a disk group
 10     Enable (online) a disk device
 11     Disable (offline) a disk device
 12     Mark a disk as a spare for a disk group
 13     Turn off the spare flag on a disk
 list   List disk information
 ?      Display help about menu
 ??     Display help about the menuing system
 q      Exit from menus

Select an operation to perform:
```

3. Type **6** and press **Enter**.

   The system displays the following information:

```
Mirror volumes on a disk
Menu: VolumeManager/Disk/Mirror

This operation can be used to mirror volumes on a disk.  These
volumes can be be mirrored onto another disk or onto any
available disk space.  Volumes will not be mirrored if they are
already mirrored.  Also, volumes that are comprised of more than
one subdisk will not be mirrored.

Mirroring volumes from the boot disk will produce a disk that
can be used as an alternate boot disk.
```

```
At the prompt below, supply the name of the disk containing the
volumes to be mirrored.

Enter disk name [<disk>,list,q,?]
```

4. Type **rootdisk** and press **Enter**.

   The system displays the following:

```
You can choose to mirror volumes from disk rootdisk onto any
available disk space, or you can choose to mirror onto a
specific disk.  To mirror to a specific disk, select the name of
that disk.

To mirror to any available disk space, select "any".

Enter destination disk [<disk>,list,q,?] (default: any)
```

5. Type **disk01** and press **Enter**.

   The system displays the following:

```
The requested operation is to mirror all volumes on disk
rootdisk in disk group rootdg onto available disk space on disk
disk01.

NOTE: This operation can take a long time to complete.

Continue with operation? [y,n,q,?] (default: y) y
```

6. Type **y** and press **Enter**.

   The system mirrors the volumes to the second disk, then displays the following:

```
Mirroring of disk rootdisk is complete.

Mirror volumes on another disk? [y,n,q,?] (default: n) n
```

7. Type **n** and press **Enter**.

   The system displays the following:

```
Volume Manager Support Operations
Menu: VolumeManager/Disk

1      Add or initialize one or more disks
2      Encapsulate one or more disks
3      Remove a disk
4      Remove a disk for replacement
5      Replace a failed or removed disk
6      Mirror volumes on a disk
7      Move volumes from a disk
```

```
8       Enable access to (import) a disk group
9       Remove access to (deport) a disk group
10      Enable (online) a disk device
11      Disable (offline) a disk device
12      Mark a disk as a spare for a disk group
13      Turn off the spare flag on a disk
list    List disk information

?       Display help about menu
??      Display help about the menuing system
q       Exit from menus

Select an operation to perform: q
```

8. Type **q** and press **Enter**.

   You have exited the Volume Manager.

9. Type **/mtce/bin/mirrorvexvol** and press **Enter** to verify that the images exist.

   The system displays the number of mirror images for each volume. This number should be *2*, as shown in the following example:

```
appl 2
fax 2
mtce 2
oracle 2
rootdisk6vol 2
rootvol 2
standvol 2
support 2
swapvol 2
tmp 2
unused1 2
voice1 2
vs 2
```

Re-establishing mirroring for a restored system

These instructions assume that you have restored the system from a backup using procedures in the section "Restoring the System Using mkimage" of *CONVERSANT System Version 8.0 System Reference, 585-313-215*, and that the system has successfully booted.

Note:
Upon booting the system for the first time, the system displays *vxconfigd* errors. This is normal, since the vxdaemon is not configured and running.

Re-establishing mirroring involves the following steps:

1. Starting the vxdaemon and encapsulating disks
2. Verifying that the disks are online and ready to be mirrored
3. Mirroring the volumes to the second drive

Starting the vxdaemon and encapsulating disks

1. Type **/usr/sbin/vxinstall** and press **Enter**.

   The system displays the following:

   ```
   The Volume Manager appears to be installed already.  You should
   use vxdiskadm to add more disks to the system.  Installation
   with vxinstall will attempt to reinstall the Volume Manager from
   the beginning. Depending upon how your system is currently
   configured, a reinstallation may fail and could leave your
   system unusable.

   Are you sure you want to reinstall [y,n,q,?] (default: n) y
   ```

2. Type **y** and press **Enter**.

   The system responds with the following prompt:

   ```
   Are you absolutely sure [y,n,q,?] (default: n)
   ```

3. Type **y** and press **Enter**.

   The system searches for disks and creates a name for them, displaying the results as follows:

   ```
   Volume Manager Installation
   Menu: VolumeManager/Install


   The Volume Manager names disks on your system using the
   controller and disk number of the disk, substituting them into
   the following pattern:

           c<controller>b<bus>t<target>d<disk>

   Some examples would be:

           c0b0t0d0        - first controller, bus 0, first target,
   first disk
           c1b0t0d0        - second controller, bus 0, first
   target, first disk
           c1b0t1d0        - second controller, bus 0, second
   target, first disk

   The Volume Manager has detected the following controllers on
   your system:

           c0:
   ```

```
Hit RETURN to continue.
```

4. Press **Enter**.

   The system displays the following:

```
Volume Manager Installation
Menu: VolumeManager/Install

You will now be asked if you wish to use Quick Installation or
Custom Installation. Custom Installation allows
you to select how the Volume Manager will handle the
installation of each disk attached to your system.

Quick Installation examines each disk attached to your system
and attempts to create volumes to cover all disk partitions that
might be used for file systems or for other similar purposes.

If you do not wish to use some disks with the Volume Manager, or
if you wish to reinitialize some disks, use the Custom
Installation option Otherwise, we suggest that you use the Quick
Installation option.

Hit RETURN to continue.
```

5. Press **Enter**.

   The system displays the following:

```
Volume Manager Installation Options
Menu: VolumeManager/Install

1      Quick Installation
2      Custom Installation

?      Display help about menu
??    Display help about the menuing system
q      Exit from menus

Select an operation to perform:
```

6. Type **1** and press **Enter**.

   The system displays the following:

```
Volume Manager Quick Installation
Menu: VolumeManager/Install/QuickInstall

The c0b0t0d0 disk is your Boot Disk.  You can not add it as a
new disk.  If you encapsulate it, you will make your root
filesystem and other system areas on the Boot Disk into volumes.
```

```
This is required if you wish to mirror your root filesystem or
system swap area.

Encapsulate Boot Disk [y,n,q,?] (default: n)
```

7. Type **y** and press **Enter**.

   The system displays the following:

```
Enter disk name for c0b0t0d0 [<name>,q,?] (default: rootdisk)
```

8. Press **Enter**.

   The system displays the following:

```
The c0b0t0d0 disk has been configured for encapsulation.

Hit RETURN to continue.
```

9. Press **Enter**.

   The system detects the attached disks and displays them:

```
Volume Manager Quick Installation
Menu: VolumeManager/Install/QuickInstall/c0
Generating list of attached disks on ....

<excluding root disk >

 The Volume Manager has detected the following disks on
controller c0:

  c0b0t1d0

Hit RETURN to continue.
```

10. Press **Enter**.

    The system asks you if you want to initialize all disks:

```
Volume Manager Quick Installation For Controller c0
Menu: VolumeManager/Install/QuickInstall/c0

Initialize all disks on this controller ? (destroys data on
these disks)
[y,n,q,?] (default: n)
```

11. Press **n** and press **Enter**.

    Important:
    You MUST answer **n** for this prompt.

The system notifies you that it will try to encapsulate the disks:

```
Volume Manager will now try to encapsulate all the disks on this
controller.

Disks not having valid partitons will be initialized.

Hit RETURN to continue.
```

12. Press **Enter**.

    The system prompts you for the default disk names:

```
Volume Manager Quick Installation
Menu: VolumeManager/Install/QuickInstall/c0/Encap

Use default disk names for these disks? [y,n,q,?] (default: y)
```

13. Type **y** and press **Enter**.

    The system accepts the default disk name and asks you if you want to perform a surface analysis:

```
The c0b0t1d0 disk will be given disk name disk01

The c0b0t1d0 disk appears to be empty. Adding as a new disk.

Perform surface analysis (highly recommended)
[y,n,q,?] (default: y)
```

14. Type **n** and press **Enter**.

    Important:
    You must answer **n** for this prompt.

    The system prompts you to hit RETURN to continue.

15. Press **Enter**.

    The system summarizes your choices and asks you to confirm them:

```
Volume Manager Quick Installation
Menu: VolumeManager/Install/QuickInstall

The following is a summary of your choices.

        c0b0t0d0        Encapsulate
        c0b0t1d0        New Disk

Is this correct [y,n,q,?] (default: y)
```

16. Type **y** and press **Enter**.

The system displays the following message:

```
The system now must be shut down and rebooted in order to
continue the reconfiguration.
Shutdown and reboot now [y,n,q,?] (default: n)
```

17. Type **y** and press **Enter**.

    The system begins the shutdown process and boots four times.

18. When the system displays the console prompt after the fourth reboot, proceed to Verifying disks are online and ready to be mirrored on page 25.

Verifying disks are online and ready to be mirrored

1. At the console login prompt, log in as root.
2. Type **/usr/sbin/vxdiskadm** and press **Enter**.

   The system displays the Volume Manager menu:

```
Volume Manager Support Operations
Menu: VolumeManager/Disk

 1      Add or initialize one or more disks
 2      Encapsulate one or more disks
 3      Remove a disk
 4      Remove a disk for replacement
 5      Replace a failed or removed disk
 6      Mirror volumes on a disk
 7      Move volumes from a disk
 8      Enable access to (import) a disk group
 9      Remove access to (deport) a disk group
 10     Enable (online) a disk device
 11     Disable (offline) a disk device
 12     Mark a disk as a spare for a disk group
 13     Turn off the spare flag on a disk
 list   List disk information

 ?      Display help about menu
 ??     Display help about the menuing system
 q      Exit from menus

Select an operation to perform:
```

3. Type **list** and press **Enter**.

   The system displays the following:

```
List disk information
Menu: VolumeManager/Disk/ListDisk

Use this menu operation to display a list of disks.  You can
also choose to list detailed information about the disk at a
specific disk device address.

Enter disk device or "all" [<address>,all,q,?] (default: all)
```

4. Press **Enter**.

   The system displays the status of all the disks, similar to the following:

```
DEVICE       DISK         GROUP        STATUS
c0b0t0d0     rootdisk     rootdg       online
c0b0t1d0     disk01       rootdg       online

Device to list in detail [<address>,none,q,?] (default: none)
```

5. Verify that the status of each disk is *online*.
6. Type **q** and press **Enter**.

   The system displays the Volume Manager menu:

```
Volume Manager Support Operations
Menu: VolumeManager/Disk

 1      Add or initialize one or more disks
 2      Encapsulate one or more disks
 3      Remove a disk
 4      Remove a disk for replacement
 5      Replace a failed or removed disk
 6      Mirror volumes on a disk
 7      Move volumes from a disk
 8      Enable access to (import) a disk group
 9      Remove access to (deport) a disk group
 10     Enable (online) a disk device
 11     Disable (offline) a disk device
 12     Mark a disk as a spare for a disk group
 13     Turn off the spare flag on a disk
 list   List disk information

 ?      Display help about menu
 ??     Display help about the menuing system
 q      Exit from menus

Select an operation to perform:
```

7. Proceed to Steps 3 through 9 in Re-establishing mirrored volumes on page 15 to mirror the volumes on the second hard disk drive.

Quick Reference

This section is for quick reference only. Avaya HIGHLY recommends that you follow the detailed sections *Creating a mkimage backup with a mirrored system* on page 9 and *Re-establishing mirroring for a restored system* on page 19 to thoroughly understand all the steps in the complete process.

The following table lists the commands used to create mirror images of all the volumes on the system.

Commands (in order)	**Function**
/mtce/bin/mirrorvexvol	Verify two mirrors for each volume
/mtce/bin/rmvolmirr	Turn off mirroring
/etc/vx/bin/vxunroot	Convert root, stand, swap from volumes to partitions
shutdown –i6 –g0 –y	Reboot system after vxunroot
mkimage	Perform mkimage of system
/etc/vx/bin/vxroot	Convert root, stand, swap from partitions to volumes
shutdown –i6 –g0 –y	Reboot system after vxroot
/usr/sbin/vxdiskadm	Mirror volumes from primary to secondary disk

The following table lists the commands used to restore system files.

Commands (in order)	**Function**
/usr/sbin/vxinstall	Encapsulate drives and volumes
/usr/sbin/vxdiskadm	Mirror volumes from primary disk to secondary disk