VERITAS™

VERITAS Volume Manager 4.1

Hardware Notes

Solaris x64 Platform Edition

N13104F

November 2005

Disclaimer

The information contained in this publication is subject to change without notice. VERITAS Software Corporation makes no warranty of any kind with regard to this manual, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. VERITAS Software Corporation shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this manual.

VERITAS Legal Notice

VERITAS Software Corporation
350 Ellis Street
Mountain View, CA 94043
USA
Phone 650–527–8000 Fax 650–527–2908
www.veritas.com

Third-Party Legal Notices

Data Encryption Standard (DES) Copyright

Sun Microsystems Trademarks

Contents

Preface

The *VERITAS Volume Manager™ Hardware Notes* provides hardware information on VERITAS Volume Manager (VxVM) Release 4.1.

This guide is intended for system administrators responsible for installing, configuring, and maintaining systems under the control of VxVM. The purpose of this manual is to provide the system administrator with information on hardware requirements for VxVM 4.1.

This guide assumes that you have a:

- working knowledge of the Solaris™ operating system
- basic understanding of Solaris system administration
- basic understanding of storage management

This manual describes how to use the VxVM command line interface for administering hardware with VxVM. Detailed descriptions of the VxVM commands and utilities, their options, and details on their use are located in the VxVM manual pages.

Note Most VxVM commands require superuser or other appropriate privileges.

Conventions

Convention	Usage	Example
`monospace`	Used for path names, commands, output, directory and file names, functions, and parameters.	Read tunables from the `/etc/vx/tunefstab` file. See the `ls`(1) manual page for more information.
`monospace` (**`bold`**)	Indicates user input.	# **`ls pubs`** C:\> **`dir pubs`**
italic	Identifies book titles, new terms, emphasized text, and variables replaced with a name or value.	See the *User's Guide* for details. The variable *system_name* indicates the system on which to enter the command.
bold	Depicts GUI objects, such as fields, list boxes, menu selections, etc. Also depicts GUI commands.	Enter your password in the **Password** field. Press **Return.**
blue text	Indicates hypertext links.	See "Getting Help" on page vii.
#	Unix superuser prompt (all shells).	# **`cp /pubs/4.0/user_book /release_mgnt/4.0/archive`**
C:\>	Windows user prompt.	C:\> **`copy \pubs\4.0\user_book c:\release_mgnt\4.0\archive`**

Getting Help

For technical assistance, visit http://support.veritas.com and select phone or email support. This site also provides access to resources such as TechNotes, product alerts, software downloads, hardware compatibility lists, and the VERITAS customer email notification service. Use the Knowledge Base Search feature to access additional product information, including current and past releases of product documentation.

Diagnostic tools are also available to assist in troubleshooting problems associated with the product. These tools are available on disc or can be downloaded from the VERITAS FTP site. See the `README.VRTSspt` file in the `/support` directory for details.

For license information, software updates and sales contacts, visit https://my.veritas.com/productcenter/ContactVeritas.jsp. For information on purchasing product documentation, visit http://webstore.veritas.com.

Documentation Feedback

Your feedback on product documentation is important to us. Send suggestions for improvements and reports on errors or omissions to foundation_docs@veritas.com. Include the title and part number of the document (located in the lower left corner of the title page), and chapter and section titles of the text on which you are reporting. Our goal is to ensure customer satisfaction by providing effective, quality documentation. For assistance with topics other than documentation, visit http://support.veritas.com.

Hardware Notes

This document provides hardware support information for VERITAS Volume Manager (VxVM) Release 4.1.

The following topics are discussed in this guide:

Hardware Support in VxVM 4.1

This release of VxVM has been tested on Solaris 10 (64-bit).

You can extract a list of supported hardware including arrays from the VERITAS customer support web site at http://support.veritas.com.

The DMP Command Utility (vxdmpadm)

The `vxdmpadm` utility administers the DMP functionality of VxVM. Refer to the manual page of the `vxdmpadm`(1M) utility for a detailed description of the options and attributes of this command.

You can use the `vxdmpadm` utility option `listctlr` to list all controllers connected to disks that are attached to the host. For example, to list all controllers connected to disks on the host, use the following command:

```
# vxdmpadm listctlr all
```

to display the output from the above command:

```
CTLR-NAME       ENCLR-TYPE      STATE      ENCLR-NAME
=====================================================
c0              OTHER           ENABLED    Disk
c1              Disk            ENABLED    Disk
c2              Disk            ENABLED    Disk
```

The previous displayed output shows that:

- The first controller `c0` is connected to disk(s) that are not under any recognized DMP category.
- The second and third controllers (`c1` and `c2`) are connected to a Sun StorEdge 3310 disk array.

All the above controllers are in the ENABLED state which indicates that they are available for I/O operations.

The state DISABLED is used to indicate that controllers are unavailable for I/O operations. The unavailability can be due to a hardware failure or due to I/O operations being disabled on that controller by the System Administrator. The controller state can be changed by using the `vxdmpadm` utility.

To list all the paths that are connected to a particular controller, you can use the `getsubpaths` option with the `ctlr` attribute. For example, use the following command:

```
# vxdmpadm getsubpaths ctlr=c1
```

to display the output from the above command:

```
NAME       STATE     PATH-TYPE  DMPNODENAME  ENCLR-TYPE   ENCLR-NAME
=============================================================================
c1t0d0s2   ENABLED     -        c2t0d0s2     Disk          Disk0
c1t1d0s2   ENABLED     -        c2t1d0s2     Disk          Disk
c1t2d0s2   ENABLED     -        c2t2d0s2     Disk          Disk
c1t3d0s2   ENABLED     -        c2t3d0s2     Disk          Disk
c1t4d0s2   ENABLED     -        c2t4d0s2     Disk          Disk
c1t5d0s2   ENABLED     -        c2t5d0s2     Disk          Disk
c1t6d0s2   ENABLED     -        c2t6d0s2     Disk          Disk
```

```
c1t16d0s2   ENABLED     -         c2t16d0s2    Disk          Disk
c1t17d0s2   ENABLED     -         c2t17d0s2    Disk          Disk
c1t18d0s2   ENABLED     -         c2t18d0s2    Disk          Disk
c1t19d0s2   ENABLED     -         c2t19d0s2    Disk          Disk
c1t20d0s2   ENABLED     -         c2t20d0s2    Disk          Disk
c1t21d0s2   ENABLED     -         c2t21d0s2    Disk          Disk
c1t22d0s2   ENABLED     -         c2t22d0s2    Disk          Disk
```

The output display shows the paths that are connected to the controller named **c1**.

Additional information displays as follows:

- Path `c1t0d0s2` (represented by nodes in the `/dev/rdsk and /dev/dsk` directories) is in the ENABLED state.
- Path `c1t0d0s2` is represented by the DMP metanode `c2t0d0s2`, which is represented by device nodes in the `/dev/vx/dmp` and `/dev/vx/rdmp` directories.

You can use the `getsubpaths` option combined with the `dmpnodename` attribute to list all paths that are connected to a `LUN` (represented by a DMP device). For example, to list information about paths that lead to the LUN named `c1t0d0s2`, use the following command:

```
# vxdmpadm getsubpaths dmpnodename=c1t0d0s2
```

to display the output from the above command:

```
NAME        STATE     PATH-TYPE  CTLR-NAME  ENCLR-TYPE   ENCLR-NAME
=============================================================================
c2t0d0s2    DISABLED    -        c2         Disk          Disk
c1t0d0s2    ENABLED     -        c1         Disk          Disk
```

The listing above shows that the DMP device `c1t0d0s2` has two paths to it that are named `c1t0d0s2` and `c2t0d0s2`. Additional information indicates that only one of these paths is available for I/O operations. One of these paths is in the ENABLED state and the other is in the DISABLED state. Both paths are in a SEAGATE disk array.

To retrieve the name of the DMP device that controls a particular path, the `getdmpnode` option can be combined with the `nodename` attribute by using the following command:

```
# vxdmpadm getdmpnode nodename=c1t0d0s2
```

to display the output from the above command:

```
NAME        STATE     ENCLR-TYPE   PATHS  ENBL  DSBL  ENCLR-NAME
=============================================================
c2t0d0s2    ENABLED   Disk      2      2     0        Disk
```

This example output shows that the physical path `c1t0d0s2` is owned by the DMP device `c2t0d0s2`, which has two paths to it.

Installing an Array Support Library (ASL)

VxVM provides Dynamic Multipathing (DMP) support for new disk arrays in the form of Array Support Library (ASL) software packages. You can obtain ASL packages for new arrays from:

- The VxVM release CD-ROM CD1 in the `veritas_enabled` directory.
- The Storage Array Vendor's support site.
- The VERITAS Technical Support site, http://support.veritas.com. Select "Volume Manager" from the Product Family menu and "Volume Manager on Unix" from the Product men. Then click on Knowledge Base Search and enter "asl" followed by the vendor and/or model name.

VxVM 4.0 allows an ASL to be added to a running VxVM system (see "Adding an ASL package" on page 5). This means that you can add support for a particular disk array type (including multipathing support by Dynamic Multipathing, DMP) without having to: stop VxVM, reboot the system, or modify the VxVM package.

Note For the installed ASL to be discovered correctly, the array LUNs must be visible to the operating system through multiple paths, and they must be appropriately configured to support DMP. For instructions on how to configure the array correctly, please contact the array vendor.

You can also remove ASL packages from a running VxVM system (see "Removing an ASL Package" on page 6). If the associated disk array type contains active volumes, these will remain available during and after the addition or removal of the ASL package.

Only one version of an ASL for a specific type/model of disk array can be active in the system. To install a different version of an ASL, you need to first remove the previous version of the ASL package, then install the new package (see "Upgrading an ASL Package" on page 6).

Commands Used to Maintain ASL Packages

The following packaging commands are available for installing, removing, and listing ASL packages.

Install	Remove	Obtain Information
`pkgadd`	`pkgrm`	`pkginfo`

See the appropriate manual page for more information on these commands.

Adding an ASL package

Only one version of an ASL can be active in the system. If you find a version of the ASL is already installed, you need to refer to Upgrading an ASL Package.

Note Disk arrays that are supported by an ASL do not have to be connected to the system when the ASL package is installed.

To find out if package (*ASL_name*) is already installed; enter:

```
# pkginfo -l ASL_name
```

You will find the ASL packages on the Storage foundation CDROM CD1 in the */mount_point*/storage_foundation/veritas_enabled directory. They have the format, *packagename*.gz.tar.

To add an ASL package from CD-ROM, proceed as follows:

1. Change directory to the ASL packages directory;

   ```
   # cd /mount_point/storage_foundation/veritas_enabled
   ```

2. Copy the required package to a temporary directory:

   ```
   # cp packagename.tar.gz /tmp
   ```

3. Change directory to the temporary directory:

   ```
   # cd /tmp
   ```

4. Unzip and extract the package:

   ```
   # gzcat packagename.tar.gz | tar -xvf -
   ```

5. Use pkgadd to install the package:

   ```
   # pkgadd -d . ASL_Name
   ```

If vxconfigd is active, invoke Device Discovery Layer (DDL) to allow the newly installed ASL libraries to claim the disk arrays:

```
# vxdctl enable
```

If vxconfigd is not active, then invoke DDL the next time vxconfigd is activated.

(See VERITAS Volume Manager manual pages for command information).

6. Verify that disk array was claimed by the *ASL_name* library:

   ```
   # vxdmpadm listenclosure all
   # vxdisk list cxtxdxs2
   # vxdmpadm getsubpaths ctlr=cx
   ```


(where *x* is the appropriate control unit no.)

Note If disk array has multiple paths, use the above commands to verify that all paths to disk are claimed.

Removing an ASL Package

Before removing an ASL package, first find out if the package (*ASL_name*) is installed; enter:

```
# pkginfo -l ASL_name
```

1. To remove an ASL package you enter:

   ```
   # pkgrm ASL_name
   ```

2. If vxconfigd is active, invoke Device Discovery Layer (DDL) through the `vxdctl` command to allow the arrays to be reclaimed:

   ```
   # vxdctl enable
   ```

   If vxconfigd is not active, then invoke DDL the next time vxconfigd is activated.

   (See VERITAS Volume Manger manual pages for command information.)

3. Verify that disk array was claimed as "Disk".

   ```
   # vxdmpadm listenclosure all
   ```

Note If the disk array has multiple paths, they must all be claimed as "DISK" (use the vxddladm addjbod command); otherwise, duplicate diskid errors will be detected.

Upgrading an ASL Package

Before upgrading an ASL package (installing a new version of an already installed package), first find out if the old package (*ASL_name*) is already present; enter:

```
# pkginfo -l ASL_name
```

1. Remove the package (*ASL_name*):

   ```
   # pkgrm ASL_name
   ```

2. Proceed with Adding an ASL package.

DMP and JBOD Disk Array Support

DMP on JBOD drives enables DMP to multipath JBOD disk arrays connected to a system using VxVM. These JBOD disk arrays/disks can contain disks from any vendor. However, DMP can correctly detect multiple paths to these disks/disk arrays only if the following conditions are satisfied:

- The serial number field of the Standard SCSI INQUIRY DATA (bytes 36—47) should be “world wide unique” for any disk that is connected to a JBOD. This fact must be known to the user before the user attempts to configure DMP to add these disks to the JBOD category of DMP.

Caution If any disk does not provide a unique serial number, DMP cannot detect multiple paths to the disk correctly and results are unpredictable. Contact the JBOD disk/disk array vendors to get correct information about unique serial numbers on disks.

- The JBOD disk arrays that require multipathing functionality from DMP should be of the Active/Active or Active/Passive types.

Once it is known that disks connected to a JBOD disk array satisfy the above conditions, you must use the `vxddladm addjbod` command to add disks to the JBOD category. See vxddladm (1) for further information.