Using the Logical Volume Manager

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Note

Before using this information and the product it supports, read the general information under “Appendix. Notices” on page 9.

First Edition (2000)

This edition applies to the Convenience Package for IBM OS/2 Warp Version 4 and to all subsequent releases and modifications until otherwise indicated in new editions.

Contents

About this book

This book provides information about using the Logical Volume Manager (LVM), a disk management tool. LVM replaces the Fixed Disk utility (FDISK) and is used to manage the disks and drives on your system. With LVM, you can create volumes and partitions, assign drive letters, span a disk across physical hard drives, and define volumes that include multiple hard drives.

Note: LVM uses two user interfaces: a GUI and a text interface. This book provides instructions for the GUI interface.

Who should read this book

This book is intended for users of OS/2 Warp 4.0 with the Convenience Package for OS/2 Warp 4.0 applied.

Conventions and terminology used in this book

The following sections describe the conventions and terminology used in this book.

Conventions

The following conventions are used in this book:

- **Boldface type** indicates the name of an item you need to select, field names, and folder names. It also indicates controls (when used in procedures), such as:
  - Menu bar choices
  - Radio buttons
  - Push buttons
  - List boxes
  - Check boxes
  - Entry fields
  - Read-only entry fields
- *Italic type* indicates technical terms, book and diskette titles, words of emphasis, or variable information that must be replaced by an actual value.
- **UPPERCASE TYPE** indicates a file or directory name, command name, or acronym.

Terminology

The following terminology is used to discuss LVM in this book.

File system

The function that stores data and indexing information on disk sectors, using a particular arrangement and method to access it. A disk volume must be capable of holding data to be used by applications and a directory structure for applications to organize and locate data. To prepare a volume for use by a file system, a formatting program is executed to create the indexing and directory infrastructure. After formatting is completed, the volume can be used by applications. Note that you cannot use LVM to format a volume.

Free space
The area on a hard disk that has *not* been allocated as partitions for use by a file system or an operating system. To use free space on a hard disk, you must first allocate the space into a volume using LVM, and then format the volume for a particular file system.

Hard disk
A physical device used to store data. A hard disk can have a label, or name, assigned to it and can be divided into one or more partitions.

Partition
A physical segment on a hard disk that has been allocated for use by a file system or an operating system. A partition can have a label assigned to it, but it does not have a drive letter. A hard disk can contain one or more partitions.

Partitions can be one of three types: extended, primary, or logical.

Extended partition
An *extended partition* is defined in the master boot record of a hard disk, but it must be divided into one or more logical partitions to be used. This arrangement exists to overcome the limit of four primary partitions. The maximum number of logical partitions within an extended partition is not a fixed number, but it is limited only by installation-dependent, practical considerations.

Note: The LVM utilities do not display or directly enable configuration of extended partitions. Operations on logical partitions are automatically performed within an extended partition.

Logical partition
Logical partitions are defined within an extended partition but are otherwise similar to primary partitions. There are operating system-dependent restrictions on booting from logical partitions, so they are generally used for data. OS/2 does not restrict booting from logical partitions. As a result, OS/2 can be installed on a logical partition as long as Boot Manager is installed on the active (bootable) primary partition.

Primary partition
Primary partitions are defined in the master boot record on the first sector of each hard disk. A physical disk can have a maximum of four primary partitions, or three primary partitions and one extended partition.

The one primary partition that has the boot indicator set in the master boot record is called the *active partition*. One primary partition must be marked active to start the computer from a hard disk. On most computers, this must be the first hard disk. The active partition must contain an operating system or a program, such as Boot Manager, from which you can select a partition that has an operating system.

Volume
Storage space on a hard disk that has been assigned a drive letter for use by a file system or operating system. A volume can contain one or more partitions and can have a label assigned to it. A logical volume can consist of one or more partitions, and it is logically treated as if it were a single, contiguous partition.

Two types of volumes are possible with LVM: compatibility volumes and LVM volumes:

Compatibility volume
A compatibility volume is compatible with previous versions of OS/2 and other operating systems. It corresponds to a single physical partition on a single physical hard disk. It can be made bootable.

LVM volume
An LVM volume is not recognized by or accessible to previous versions of OS/2 or other operating systems. An LVM volume can span multiple partitions and physical hard disks. It cannot be made bootable.

Related information

Additional information about using OS/2 Warp Version 4 can be found in the following places:

- The Convenience Package for IBM OS/2 Warp Version 4 README
- *OS/2 Desktop Guide*
- *File and Print Client Guide*

The above information is included on the Convenience Package for IBM OS/2 Warp Version 4 CD.

Using the Logical Volume Manager

The Logical Volume Manager (LVM) enables you to create and manage volumes on the hard disks in your system. LVM components are initially installed and configured during the Convenience Package for IBM OS/2 Warp 4.0 installation process.

You can perform the following tasks with LVM:

- Create compatibility volumes (partitions), which can be seen by previous versions of OS/2 and other operating systems
- Create logical volumes that span physical disks
- Delete compatibility volumes (partitions)
- Delete logical volumes

LVM can also be used after installation to perform additional configuration, if necessary.

Starting LVM

To start LVM:

1. Double-click **OS/2 System**.
2. Double-click **System Setup**.
3. Double-click **Logical Volume Manager**.

LVM provides both physical and logical views of the system. The physical view shows how the hard disks are configured. The logical view displays the volumes currently configured on the system. You can switch between the two views by selecting **View** from the toolbar and choosing the view you want.

Physical View

The physical view of LVM allows you to create and manage partitions on the hard disks in your system. This view has two windows to show how the disks are partitioned and the volumes that are associated with them. This view displays the partitions present on each hard disk, enabling you to create and manage individual partitions. When you select a partition, the details of that partition or the volume associated with that partition are displayed in the lower window.

The physical view includes the following information:

Volume Name The name that has been assigned to the volume. A volume consists of one or more partitions. It is assigned a drive letter and is treated as if it were a single, contiguous partition. You can specify the name with the **Create Volume** option, and you can change the name with the **Set/Change Name on Volume** option.

Partition Name
The name that has been assigned to the partition. You can specify this name with the **Create Partition** option.

Status Indicates the status of the partition.

File System Indicates the type of file system on the volume. Volumes that have not been formatted do not have a file type indicated.

Size (MB) Indicates the size, in megabytes (MB), of the volume.

Type Indicates the type of partition.

Logical View

The logical view displays the volumes, their size, the unused portion size, and the volume name, and it indicates if the volume is linked. You can use this view to create, delete, and name volumes.

The logical view includes the following information:

Name The name that has been assigned to the volume. A volume consists of one or more partitions. It is assigned a drive letter and is treated as if it were a single, contiguous partition. You can specify the name with the **Create volume** option, and you can change the name with the **Set/change name of volume** option.

Status Indicates the status of the volume (such as ″startable″).

File System Indicates the type of file system on the volume. Volumes that have not been formatted will not have a file type indicated.

Size (MB) Indicates the size, in megabytes (MB), of the volume.

% Used Indicates the amount of space used on a volume.

Unused (MB) Indicates the usable free space, in megabytes (MB).

Tyle Indicates the volume type.

Managing Volumes

The following sections describe creating and managing volumes.

Creating a Volume

Use **Create volume** to create a volume. A volume consists of one or more disk partitions. Each volume is then assigned a drive letter. Currently, volumes have drive letters assigned to them, but partitions do not. You can create two types of volumes:

- Bootable Volume
- Nonbootable Volume

Creating a Bootable Volume

A bootable volume is a volume that can be used to boot an operating system. Only compatibility volumes are bootable.

To create a bootable volume:

1. Select **Volume** from the toolbar.
2. Select **Create volume**.
3. Select **Create bootable volume**.
4. Type the new volume name in the space provided.
5. Choose the new drive letter associated with the volume and select the partition or free space to create the volume from.
6. Click **OK**. The new volume name and drive letter is now displayed.

Creating a Non-bootable Volume

A non-bootable volume is a volume that cannot be used to boot an operating system. It can be a compatibility volume or an LVM volume.

To create a non-bootable volume:

1. Select **Volume** from the toolbar.
2. Select **Create volume**.
3. Select **Create non-bootable volume**.
4. Select **Create compatibility volume** if you want the volume to be accessed by other operating systems and previous versions of OS/2. Otherwise, select **Create LVM volume** if you want the volume to span multiple disks, support Bad Block Relocation, or eventually be expanded.
5. Type the new volume name in the space provided.
6. Choose the new drive letter and select the partition(s) or free space to create the volume from.
7. Click **OK**. The new volume name and drive letter are now displayed.

Changes are effective when you save the changes and exit LVM. The system attempts to add the new volume without restarting; however, if the Disk Device Manager has exhausted its resources, the system will need to restart to make the changes effective.

Setting a Volume Startable

Use Set the volume startable to set the selected volume *startable*. A startable volume is the volume (or partition) that is used to start the system from a hard disk. It is the *active partition*. Only a compatibility volume on a primary partition can be set startable with LVM. Boot Manager, if installed, is automatically set as the startable partitions. Only one partition can be set as startable; if Boot Manager is to be active, no volumes can be set as startable. If you set a volume as startable, Boot Manager is disabled. Note that you cannot see Boot Manager from the LVM logical view because it has no drive letter assigned to it; you can see Boot Manager in the LVM physical view.

To set a volume startable:

1. Select **Volume**.
2. Select **Set volume startable**.
3. Select the volume you want to set startable.
4. Click **OK**.

Changing a Drive Letter Assigned to a Volume

Use **Set/change drive letter assigned to a volume** to change the drive letter associated with an existing volume. The new drive letter association will then remain unchanged until you change the drive letter again or delete the volume.

To change the drive letter assigned to a volume:

1. Select **Volume** from the toolbar.
2. Select **Set/change drive letter assigned to a volume**.
3. Select the volume that you want to modify. A warning is displayed that provides information about changing drive letters. Click **OK**.
4. Choose the new drive letter and click **OK**. The new drive letter is now displayed.

Note: You can also change the drive letter by right-clicking the drive letter and selecting **Set/change drive letter assigned to a volume** from the pop-up menu.

When the changes are saved, the system attempts to change the driver letter assignment without restarting; however, if the file system cannot be unmounted, or if the Disk Device Manager has exhausted its resources, the system will need to restart to make the changes effective.

Note: This option can also be used to make the volume visible to OS/2 after you have hidden it using **Hide volume from OS/2**.

Setting or Changing a Volume Name

Use **Set/change the volume name** to set or change the name of a volume. The volume name on the Boot Manager Startup menu is also changed, if applicable. The names you assign to volumes remain unchanged through restarting and hardware changes, and they always identify the same area on the disk. Volume names can be up to 20 characters long, can be entered in mixed case, and can contain spaces.

To set or change a volume name:

1. Select **Volume** from the toolbar.
2. Select **Set/change name on volume**.
3. Select the volume you want to change. A warning is displayed that provides information about changing drive letters. Click **OK**.
4. Type the volume name in the space provided and click **OK**. The new volume name is now displayed.

Note: You can also set or change the volume name by right–clicking the volume and selecting **Set/change name on volume** from the pop-up menu.

Deleting a Volume

Use **Delete volume** to delete volumes. All partition structures associated with the volume will be removed from the associated hard disk(s).

To delete a volume:

1. Select **Volume** from the toolbar.
2. Select **Delete volume**.
3. Select the volume you want to delete.
4. Click **OK** to delete the volume.

Note: You can also delete the volume name by right-clicking the volume and selecting **Delete volume** from the pop-up menu.

Hiding a Volume from OS/2

Use **Hide volume from OS/2** to make a volume invisible to OS/2.

To hide a volume from OS/2:

1. Select **Volume** from the toolbar.
2. Select **Hide volume from OS/2**.
3. Select the volume you want to hide.

4. Click **OK** to hide the volume.

Note: Use **Set/change drive letter assigned to a volume** to make the volume visible to OS/2 again.

Unhiding a Volume from OS/2

Use **Set/change drive letter assigned to a volume** to make a volume visible to OS/2.

To change the drive letter assigned to a volume:

1. Select **Volume** from the toolbar.
2. Select **Set/change drive letter assigned to a volume**.
3. Select the volume that you want to modify.
4. Choose the new drive letter and click **OK**. The new drive letter is now displayed.

Note: You can also change the drive letter by right-clicking the volume and selecting **Set/change drive letter assigned to a volume**.

When the changes are saved, the system attempts to change the driver letter assignment without restarting; however, if the file system cannot be unmounted, or if the Disk Device Manager has exhausted its resources, the system will need to restart to make the changes effective.

Managing Partitions

The following sections describe creating and managing partitions.

Creating a Partition

Use **Create Partition** to create a new partition. You can create partitions for other operating systems that do not recognize LVM volumes or linked volumes. You can also use this option to create a partition of a specific size and to allocate it from the beginning or end or free space.

Note: Partitions no longer have drive letters associated with them. You must create a volume to assign a drive letter.

To create a partition:

1. Select **Partition** from the toolbar.
2. Select **Create partition**.
3. Select the location, partition type, disk to create the partition from.
4. Click **OK**.

Note: You can also create a partition by right-clicking the free space you want to create the partition from and selecting **Create partition** from the pop-up menu.

Deleting a Partition

Use **Delete partition** to delete a partition. You cannot delete a partition that is part of a volume.

To delete a partition:

1. Select **Partition** from the toolbar.
2. Select **Delete partition**.
3. Select the partition you want to delete.
4. Click **OK**.

Note: You can also create a partition by right—clicking the partition you want to delete and selecting **Delete partition** from the pop-up menu.

Changing the Disk Name

Use **Change disk name** to change the name of the disk.

To change the disk name:

1. Select **Tools**.
2. Select **Change disk name**.
3. Select the disk whose name you want to change.
4. Type a new name for the disk in the space provided.
5. Click **OK**.

Changing the Partition Name

Use **Change partition name** to rename an existing partition.

To rename an existing partition:

1. Select **Partition**.
2. Select **Change partition name**.
3. Select the partition you want to rename.
4. Type a new name for the partition in the space provided.
5. Click **OK**.

Using the Boot Manager

Boot Manager allows you to specify which volume to boot from and allows you to set or change the Boot Manager options. Boot Manager is automatically set as the startable partition at the time it is installed.

Note: Boot Manager cannot be seen from the LVM logical view because it has no drive letter assigned to it; it can be seen using the LVM physical view.

Installing Boot Manager

Boot Manager is installed as a new primary partition at the beginning of the first free space block where a new primary partition is allowed. This partition is the smallest size allowed (1 cylinder), typically between 1MB and 10MB, depending on the size of the hard disk.

To install Boot Manger:

1. Select **Boot Manager** from the toolbar.
2. Select **Install Boot Manager**.
3. Select the disk where you want to install Boot Manager.
4. Click **OK**.

Removing Boot Manager

Use **Remove Boot Manager** to remove Boot Manager from the system.

To remove Boot Manager:

1. Select **Boot Manager** from the toolbar.
2. Select **Remove Boot Manager**.

Adding a Volume to the Boot Manager Menu

Use **Add volume to Boot Manager** to add a volume to the Boot Manager Startup menu. Only volumes that are bootable are displayed on the list. Choose this option if you have more than one operating system that you want to access when your system starts.

Note: When you create a bootable volume, it is automatically added to the Boot Manager Startup menu.

To add the volume to the Boot Manager Startup menu:

1. Select **Boot Manager**.
2. Select **Add Volume to Boot Manage**r.
3. Select the volume you want to add.
4. Click **OK**.

Removing a Volume from the Boot Manager Menu

Use **Remove volume from Boot Manager** to remove a volume from the Boot Manager Startup menu.

To remove a volume:

1. Select **Boot Manager**.
2. Select **Remove volume from Boot Manager**.
3. Select the volume to remove.
4. Click **OK**.

Setting or Changing Boot Manager Startup Values

Use **Set Boot Manager startup values** to set the default boot volume, set the timer inactive, change the timeout value, or change the display mode.

To set or change Boot Manager startup values:

1. Select **Boot Manager**.
2. Select **Set Boot Manager startup values**.
3. A window is displayed, enabling you to specify the following Boot Manager options:

   Default boot section
   The default boot volume that boots automatically each time you start the system.

   Timer Active
   Specifies that the default boot volume should be booted if no boot selection is made after the timeout period.

Time-out Value

The number of seconds for the timeout period, the period of time the Boot Manager Startup menu is displayed before the default boot volume is booted.

Note: This value is active only when the **Timer Active** value is **Yes**.

Display mode

Indicates the amount of information to be displayed on the Boot Manager menu. **Normal** displays only the name of the volumes on the Startup menu; **Advanced** displays more information about the volumes, including disk number, drive letter, partition type, volume size, file system type, and accessibility.

4. Make your selections for the startup options and click **Save the changes**.
5. Click **OK**.

Committing Changes

Use **Commit Changes** to commit any changes you have made up to this point. After you commit changes, the changes cannot be undone.

To commit changes:

1. Select **Tools** from the toolbar.
2. Select **Commit Changes**.
3. Press **OK**.

Changes are effective when you save the changes and exit LVM. The system attempts to add the new volume without restarting; however, if the Disk Device Manager has exhausted its resources, the system will need to restart to make the changes effective.

To exit without saving any changes you have made, close the LVM window. On the panel that appears, select **Do not commit changes**.

Appendix. Notices

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Index

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