OS/2 Warp Server for e-business

Quick Beginnings: Installing OS/2 Warp Server for e-business

SCT7-S2NA-00

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Note

Before using this information and the product it supports, read the general information under “Appendix D. Notices” on page 97.

First Edition

This edition applies to OS/2 Warp Server for e-business and to all subsequent releases and modifications until otherwise indicated in new editions.

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About This Book

This book first describes the new features of OS/2 Warp Server for e-business, and then leads you through planning, installing, and configuring the product.

Who Should Read This Book

This book is for network administrators who are experienced with OS/2 and local area networks (LANs). Network administrators install, manage, control, and configure a network. They also define the resources to be shared, and they determine who can use those resources. Network administrators ensure that all or part of any program available on the network is shared according to the applicable program license agreement or conditions of use.

Conventions and Terminology Used in This Book

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.
- `Monospace type` indicates coding examples, special characters, text you must type, or text displayed on the computer screen.

Double-Byte Character Set (DBCS) Information

OS/2 Warp Server for e-business runs on both single-byte character set (SBCS) systems and double-byte character set (DBCS) systems. *SBCS* is a graphic character set in which each character occupies 1 byte. *DBCS* is a graphic character set in which each character occupies 1 or 2 bytes. Languages such as Japanese and Chinese, which contain more symbols than can be represented by 256-code combinations, require double-byte character sets.

Related Books and Information

The publications and online information listed below give details about components and products not covered in this book.

- “OS/2 Warp Server for e-business Publications”
- “Redbooks about OS/2 Warp Server for e-business” on page xvi
- “Technical Databases for OS/2 Products” on page xvi

OS/2 Warp Server for e-business Publications

Additional documentation and help is provided in the following formats:

- “Online Help”
- “Online Books”
- “PostScript-Formatted Books” on page xiii
- “PDF-Formatted Books” on page xiv
- “HTML-Formatted Books” on page xv

Online Help

Online help provides information about general topics, procedures, and messages. There are several ways to access online help:

- For context-sensitive help for a window, press F1 or click the **Help** menu or button.
- Select a topic from the **Help Index** by opening the **Assistance Center** folder, and then opening the **Information** folder.
- To view command-line help, type `help` at an OS/2 command prompt and press Enter. For help on a specific command, type `help`, followed by the command. For example, for help about the **LVM** command, type `help lvm` and press Enter. For a two-word command, such as **net use**, type `help "net use"` and press Enter.

Online Books

To view an online book, open the **Assistance Center** folder, and then open the appropriate folder. Click the category you want, and then open the book that you want to view.

After you open a book, you can click on links to other topics, search for specific information, or print the entire book or a portion of the book.

See *Using Online Information* in the **Assistance Center** folder for book names and descriptions.

The OS/2 Warp Server for e-business book library contains occasional references to book titles that are not listed above. The following table lists possible references and their corresponding book:

If you see a reference to:	Then refer to this book:
OS/2 Warp LAN Server Network Administrator Reference, Volume 1: Planning, Installation, and Configuration *Planning, Installation, and Configuration* *OS/2 LAN Server Up and Running!*	*Quick Beginnings*
OS/2 Warp LAN Server Network Administrator Reference, Volume 2: Performance Tuning	*Performance Tuning*
OS/2 Warp LAN Server Network Administrator Reference, Volume 3: Network Administrator Tasks	*Network Administrator Tasks*
IBM Multi-Protocol Transport Services—AnyNet for OS/2: Configuration Guide	*MPTS Configuration Guide*
OS/2 Warp Desktop Guide	*OS/2 Desktop Guide*
OS/2 Warp Command Reference *LAN Server 4.0 Commands and Utilities*	*Command Reference*
Troubleshooting *Problem Determination Guide*	*Serviceability and Troubleshooting Guide*

PostScript-Formatted Books

The *OS/2 Warp Server for e-business Server Pak CD* contains compressed (zipped) PostScript versions of the following books in the **\BOOKS\PSZIP** directory:

Title of Book	Zipped Filename
Migrating to OS/2 Warp Server for e-business, SG24-5135	MIGRATE.ZIP
Network Administrator Tasks	NETADMIN.ZIP
OS/2 Keyboards and Codepages	KEYBOARD.ZIP
Performance Tuning	PERFTUNE.ZIP
Quick Beginnings	INSTALL.ZIP

Uncompressing a Zipped PostScript File: Each PostScript book is compressed with the **PKZIP2.EXE** utility. You can uncompress each book with the **PKUNZIP2.EXE** utility that is included with OS/2 Warp Server for e-business. You must uncompress the book file on a computer that has **PKUNZIP2.EXE** or a similar utility.

To uncompress a zipped PostScript file:

1. Insert the *OS/2 Warp Server for e-business Server Pak CD* into the CD-ROM drive.
2. Open an OS/2 window.
3. Type the following command and press Enter:

   `pkunzip2 e:\books\pszip\filename`

where *e:* is your CD-ROM drive letter and *filename* is the zipped PostScript file name.

For example, to uncompress the file named **NETADMIN.ZIP**, type the following command and press Enter:

```
pkunzip2 e:\books\pszip\netadmin.zip
```

Note: The file extension on the uncompressed PostScript file is **.PS**.

Printing a PostScript Book File: After you uncompress a PostScript book, you can print it from a computer on which a PostScript-compatible printer object is defined on the Desktop.

To print a PostScript file after you have uncompressed it:

1. Make sure that the correct driver is selected in the printer object's settings.

   The word *PSCRIPT* should be part of the driver name.
2. Open the **OS/2 System** folder, and then open the **Drives** folder on the OS/2 Desktop.
3. Open the drive, and then the folder where the PostScript file is located.
4. Drag the file object onto your PostScript printer object.

PDF-Formatted Books

The *OS/2 Warp Server for e-business Server Pak CD* contains PDF (Portable Document Format) versions of the following books in the **\BOOKS\PDF** directory:

Title of Book	Filename
Migrating to OS/2 Warp Server for e-business, SG24-5135	MIGRATE.PDF
Network Administrator Tasks	NETADMIN.PDF
OS/2 Keyboards and Codepages	KEYBOARD.PDF
Performance Tuning	PERFTUNE.PDF
Quick Beginnings	INSTALL.PDF

Viewing a PDF File: You can view, navigate, and print any PDF book from a computer that has Adobe Acrobat Reader or a similar program. You can obtain a copy of Adobe Acrobat Reader from the Internet at the following address:

```
http://www.adobe.com
```

To view the PDF book after you have installed Adobe Acrobat Reader:

1. Start Adobe Acrobat Reader.
2. Click **Open** from the **File** pull-down menu.

   The **Open** window is displayed.
3. Click the drive letter of your CD-ROM drive.
4. Click the **BOOKS\PDF** directory.

5. Click the file name of the book you want to open.
6. Click the **Open** button.

HTML-Formatted Books

The *OS/2 Warp Server for e-business Server Pak CD* contains compressed (zipped) HTML versions of the following books in the **\BOOKS\HTMLZIP** directory:

Title of Book	Filename
Migrating to OS/2 Warp Server for e-business, SG24-5135	MIGRATE.ZIP

Uncompressing a Zipped HTML File: Each HTML book contains several files that are compressed with the **PKZIP2.EXE** utility. You can uncompress each book with the **PKUNZIP2.EXE** utility that is included with OS/2 Warp Server for e-business. You must uncompress the book file on a computer that has **PKUNZIP2.EXE** or a similar utility.

Note: Before you uncompress a zipped HTML file, you should create a directory where you want to place the unzipped HTML files.

To uncompress a zipped HTML file:

1. Insert the *OS/2 Warp Server for e-business Server Pak CD* into the CD-ROM drive.
2. Open an OS/2 window.
3. Type the following command and press Enter:

   `pkunzip2 e:\books\htmlzip\filename x:\book`

   where *e:* is your CD-ROM drive letter, *filename* is the zipped HTML file name, and *x:\book* is the drive letter and directory name where you want to place the unzipped HTML files.

   For example, to uncompress the file named **MIGRATE.ZIP** to a directory named **D:\BOOK**, type the following command and press Enter:

   ```
   pkunzip2 e:\books\htmlzip\migrate.zip d:\book
   ```

Viewing an HTML File: You can view, navigate, and print any HTML book from a computer that has an HTML browser. Netscape Communicator is included on the *OS/2 Warp Server for e-business CD*.

To view the HTML book:

1. Start the HTML browser.
2. Click **Open** from the **File** pull-down menu.

   The **Open** window is displayed.
3. Click the drive letter of the directory where you unzipped the HTML files.
4. Click the directory where you unzipped the HTML files.
5. Click the file name of the book you wish to open.
6. Click the **Open** button.

Redbooks about OS/2 Warp Server for e-business

The International Technical Support Organization (ITSO) provides redbooks, both printed and online, with information about various products. Redbooks, named for their red covers, are ″how to″ books written by IBM professionals worldwide.

Look for information about the following OS/2 Warp Server for e-business redbooks on the Internet at `http://www.redbooks.ibm.com`:

- *Migrating to OS/2 Warp Server for e-business, SG24-5135*
- *Inside OS/2 Warp Server for e-business, SG24-5136*
- *Beyond DHCP--Work Your TCP/IP Internetwork with Dynamic IP, SG24-5280*

Technical Databases for OS/2 Products

Personal Software Services provides technical information and assistance for the Personal Systems Support Family (PSSF) of products. This includes support for OS/2, PC DOS, and IBM software applications that run on PC operating systems, including Windows NT.

You can browse and search technical databases and download fixes or device drivers on the Internet at `http://ps.software.ibm.com`.

Chapter 1. Overview of OS/2 Warp Server for e-business

Congratulations on choosing IBM OS/2 Warp Server for e-business. OS/2 Warp Server for e-business provides server functionality in both single microprocessor (uniprocessor) and symmetrical multiprocessor (SMP) configurations.

This software is part of the IBM Software Servers family of IBM and Lotus products. OS/2 Warp Server for e-business is a platform for multifunction, compatible servers covering a broad range of needs from an entry-level database server to a server for comprehensive systems management of sophisticated networks. OS/2 Warp Server for e-business also provides workgroup functions with Lotus Domino and gets you up and running quickly as a server on the Internet.

OS/2 Warp Server for e-business provides performance and capacity enhancements for both single and multiple processor systems. The installation process determines the processor configuration, installs both the uniprocessor and SMP kernels on the hard drive, and uses the appropriate kernel.

Because many corporations use the *Configuration, Installation, and Distribution (CID)* installation process, enhancements to that process were a priority. OS/2 Warp Server for e-business includes a shell to collect installation data and to generate a response file for input to the CID installation of individual services. All operating system services are CID-installable. For detailed information about CID changes and enhancements, see the **README.CID** file on the *Installation Diskette* and *Migrating to OS/2 Warp Server for e-business, SG24-5135* on the *OS/2 Warp Server for e-business Server Pak CD*.

The processes to prepare the hard disk for installation have been updated. OS/2 Warp Server for e-business Logical Volume Manager support, described in “Logical Volume Manager” on page 3, lets you define file systems that span physical disks. You can define a Journaled File System (JFS) that gives you larger file capability and enhanced recovery compared to other OS/2 file systems.

New hardware that becomes available after OS/2 Warp Server for e-business is installed can be supported with modifications to the diskettes used to start the installation process.

OS/2 Warp Server for e-business adds value to your existing LAN by providing interoperability with other LANs. OS/2 Warp Server for e-business interoperates with:

- OS/2 Warp Server and previous OS/2 LAN Server releases
- OS/2 LAN Server clients, such as WorkSpace on-Demand, OS/2 Warp 4, OS/2 Warp 3, DOS LAN Services, and LAN Support Program (LSP)
- LAN Server on VM, MVS, AIX, and AS/400
- Microsoft NT servers
- Microsoft Windows NT/98/95/ clients
- Microsoft Windows for Workgroups

- Microsoft LAN Manager clients and servers
- Artisoft LANTastic
- DEC Pathworks

The following sections provide an overview of the major components of OS/2 Warp Server for e-business. Updated or discontinued components are also listed. See “Chapter 3. Preinstallation Planning” on page 13 for details to help you determine which installable and configurable components are right for you.

- “OS/2 Base Operating System”
- “Logical Volume Manager” on page 3
- “Journaled File System” on page 3
- “Year 2000 and the Euro” on page 3
- “Updated Desktop” on page 4
- “File and Print Sharing Services” on page 4
- “TCP/IP Services” on page 4
- “Netscape Communicator” on page 4
- “Java Support” on page 5
- “Neighborhood Browser Enabler” on page 5
- “Windows NT User Account Manager” on page 5
- “LDAP Client Support” on page 5
- “I2O Support” on page 5
- “Tivoli Management Agent” on page 6
- “Lotus Domino Go Webserver and IBM WebSphere Application Server” on page 6
- “Personally Safe ’n’ Sound Backup and Recovery” on page 6
- “Advanced Print Services” on page 7
- “Remote Access Services” on page 7
- “Additional New Features” on page 7
- “Replaced or Discontinued Components” on page 8

OS/2 Base Operating System

The base operating system for OS/2 Warp Server for e-business is an advanced, multitasking, 32-bit operating system that runs DOS, Windows, and OS/2 16-bit and 32-bit applications and utilizes SMP hardware configurations.

Logical Volume Manager

The Logical Volume Manager (LVM) provides flexibility for configuring and managing disk drives on your system. LVM replaces the Fixed Disk Utility (FDISK). Disk drives and partitions are configured as logical volumes with a new set of utilities, which supports the following enhancements:

- The drive letter for a disk volume is explicitly assigned when the volume is added, and it is persistent across OS/2 system restarts.
- A disk volume drive letter can be changed at any time; however, drive letters assigned to operating system volumes should not be changed. See “Chapter 5. Creating and Managing Volumes and Hard Disk Partitions” on page 53 for more information.
- Under most conditions, OS/2 does not need to be rebooted after a disk volume drive letter is added or changed.
- The disk volume drive letters do not need to be contiguous.
- CD-ROM drive letters can remain unchanged when disk volumes are added.
- LAN drive letter assignments can remain unchanged when disk volumes are added.
- Logical volumes can span multiple partitions and physical disks.

For detailed information about LVM, see “Logical Volume Manager” on page 15.

Journaled File System

The Journaled File System (JFS) is a scalable, 32-bit, performance-oriented file system. To facilitate quick recovery and restart after system failures, JFS uses database journaling techniques, enabling it to restore file systems quickly, which contributes to improved server availability. JFS raises the previous file-size limit of 2 gigabytes (GB) to 2 terabytes (TB). The partition size limit is raised from 64GB to 2TB. JFS volumes can be increased in size, using Logical Volume Manager (LVM), without having to be reformatted.

For detailed information about JFS, see “Journaled File System (JFS)” on page 20.

Year 2000 and the Euro

OS/2 Warp Server for e-business is fully enabled to support the Year 2000 (Y2K) and *euro currency* transitions.

The new currency in Europe goes by the name *euro*. The euro is the monetary unit of the European Monetary Union (EMU) that was introduced alongside national currencies on the first of January 1999. The original members of the EMU are Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and

Spain. The national currencies of these countries have a fixed exchange rate with the euro, and will be withdrawn after a transition period, which is planned for completion in 2002.

Support for the euro sign as the currency symbol is available when you specify country information during the installation process.

Updated Desktop

The Desktop in OS/2 Warp Server for e-business is based on the Desktop of OS/2 Warp 4. In addition, new icons are on the Desktop, and some existing icons are in a different location than they were in previous versions of OS/2 Warp Server. Take a few minutes after installing OS/2 Warp Server for e-business to become familiar with the new Desktop. Refer to *OS/2 Desktop Guide* for more information about the Desktop.

File and Print Sharing Services

File and Print Sharing Services enables the server to share directories, printers, and serial devices across a local area network (LAN).

TCP/IP Services

TCP/IP Services enables the server to distribute the TCP/IP Internet protocol configuration to client workstations. Highlights of the TCP/IP services include:

- *Dynamic Host Configuration Protocol (DHCP)* enhancements, which include Remote IPL (RIPL) support and BootP server capability
- *Dynamic Domain Name Server (DDNS)* enhancements, which enable the network administrator to more easily manage IP addresses
- Improved buffer management, resulting in increased performance
- Improved printer streaming and printer security

Refer to the TCP/IP online documentation in the **Assistance Center** folder on the Desktop for details about TCP/IP configuration after installation. Additional information is available in the redbook *Beyond DHCP--Work Your TCP/IP Internetwork with Dynamic IP, SG24-5280*.

Netscape Communicator

Netscape Communicator 4.04b lets you access and navigate the Internet with Netscape Navigator, send and receive e-mail with Netscape Messenger, keep track of the latest postings in your favorite newsgroups with Netscape Collabra, and create your own Web pages with Netscape Composer. Some applications and services, such as those found at IBM Software Choice, use the browser as a graphical user interface (GUI) for installing, uninstalling, or updating other software programs.

Java Support

The *OS/2 Warp Developers Kit, Java Edition, Version 1.1.7* delivers a full implementation of Java, including both the *Runtime* and *Development* packages. This release improves performance and provides euro support. Significant enhancements in graphics, throughput, and scalability set new standards for Java Virtual Machine (JVM) performance.

Neighborhood Browser Enabler

The Neighborhood Browser Enabler is an OS/2 Warp Server for e-business service that functions as a master browser for Windows clients. The master browser service permits OS/2 Warp Server for e-business domain resources to be viewed and shared from the Windows NT 4.0, Windows 98, and Windows 95 Network Neighborhood.

Windows NT User Account Manager

The Windows NT User Account Manager eases the management of user and group accounts in a heterogeneous server environment. This feature allows user and group accounts that are defined and managed in the OS/2 Warp Server domain to be replicated to a Windows NT 4.0 server.

LDAP Client Support

OS/2 Warp Server for e-business supports the *Lightweight Directory Access Protocol (LDAP)*, a standards-based Internet directory protocol.

The *OS/2 LDAP Client Toolkit for C and Java Version 1.0* is for C and Java programmers who want to enable new or existing applications to access, search, and update LDAP servers, using LDAP V2 or LDAP V3 protocols.

I2O Support

OS/2 Warp Server for e-business helps simplify the attachment of new devices. I2O is an industry-standard architecture that defines a new interface between a processor and I/O adapters. This specification provides for movement of function from the system CPU to the adapter card. Use of I2O, either on the system board or as an adapter in servers, reduces the CPU load, which helps increase system throughput. OS/2 Warp Server for e-business supports I2O for SCSI adapters and for ethernet and token-ring LAN adapters.

Tivoli Management Agent

The Tivoli Management Agent (TMA) extends the client/server hierarchy and enhances the scalability of a Tivoli Management Environment (TME). TME is a systems management tool for enterprise-wide, heterogeneous networks. The TMA increases the number of resources that can be managed and, at the same time, enables those resources to be used more efficiently.

Besides providing full functionality down to the endpoints, the TMA reduces the physical requirements to manage a system. The TMA is a replacement for the SystemView agent and supports OS/2 using TCP/IP.

Lotus Domino Go Webserver and IBM WebSphere Application Server

OS/2 Warp Server for e-business includes Lotus Domino Go Webserver 4.6.2.6. Lotus Domino Go Webserver is a scalable, high-performance Web server that is easy to install and maintain. It includes state-of-the-art security, site indexing capabilities, and support for *JDK 1.1.x*. Lotus Domino Go Webserver makes it possible to maintain a productive Web presence in a diverse and dynamic environment.

After you install Lotus Domino Go Webserver, you can add Java support by installing IBM WebSphere Application Server 1.1. IBM WebSphere Application Server is a plug-in for Lotus Domino Go Webserver and includes:

- A Java servlet engine that implements the JavaSoft Java Servlet API
- IBM additions and extensions to the Java Servlet API for enhanced session tracking and personalization
- Support for JavaServer Pages (JSP), a powerful approach to dynamic Web pages
- A database connection manager for caching and reusing connections to JDBC-compliant databases
- Data access JavaBeans (additional Java classes for accessing JDBC-compliant databases)
- CORBA Support—an object request broker (ORB) and a set of services that are compliant with the Common Object Request Broker Architecture (CORBA)

Personally Safe 'n' Sound Backup and Recovery

Personally Safe 'n' Sound (PSnS Backup and Recovery) is a powerful backup utility that lets you safeguard your OS/2 system against loss of data. It allows you to set up a Backup Strategy for each activity you perform on your machine. The strategy, once employed, provides protection against all of the likely causes of data loss: user errors, hardware malfunctions, malicious damage, and disasters.

For more information about using PSnS, see *OS/2 Warp Server Backup/Restore User's Guide* and the other online books that come with it. More information is available on the Internet at the following address:

http://www.software.ibm.com/os/warp/warp-server

Advanced Print Services

Advanced Print Services, also known as Print Services Facility/2 or PSF/2, allows you to print file formats that your printer typically does not support. Advanced Print Services automatically performs data stream transformations to convert the data in a document into the type of data required by the printer. For example, Advanced Print Services can transform a PostScript document into an advanced function presentation (AFP) document that can be printed on a high-speed IBM printer, or it can transform an AFP document into one that can be printed on an HP LaserJet printer.

Advanced Print Services lets users send print jobs from computers running OS/2, Windows, DOS, or AIX.

Remote Access Services

Remote Access Services, a replacement for LAN Distance, includes a remote access server that allows NetBIOS and point-to-point protocol (PPP) clients, including Microsoft Windows NT, Windows 98, Windows 95, IBM OS/2 Internet Dialer, and IBM 8235 users, to remotely access the LAN. The following services are available:

- Answering incoming calls to establish connections
- Routing and filtering data to bridge the Remote Access Client workstation to the LAN
- Providing security for LAN resources
- Performing other administrative functions for the wide area network (WAN)
- Assigning IP addresses with DDNS support

Remote Access Services allows multiple remote workstations to dial in concurrently and access LAN resources. The number of remote workstations supported is determined by your server's processing power and its communications adapters.

Additional New Features

The following additional features are new with OS/2 Warp Server for e-business:

- *Long format* option during installation. See "Formatting the Installation Volume" on page 32 for more information.
- *CHKINST.EXE* "software sniffer" utility checks the system prior to installation to determine what preparation is required and then reports the results. See "CHKINST System Checking Utility" on page 26 and *Migrating to OS/2 Warp Server for e-business, SG24-5135* for more information.
- Increase in maximum number of ACLs, open files, connections, searches, and shares. The maximum number of ACLs for the Journaled File System (JFS) is limited only by available disk space. The following capacity parameters in the **Server** section of the **IBMLAN.INI** file have been increased:

```
maxopens
maxsearches
maxconnections
maxshares
```

These changes increase the number of users, files, searches, and shares the server can maintain. See *Performance Tuning* for more information.

Replaced or Discontinued Components

The following components, previously installed with OS/2 Warp or OS/2 Warp Server, are replaced in OS/2 Warp Server for e-business:

- *Fixed Disk Utility (FDISK.COM)*, replaced by *Logical Volume Management Tool (LVM.EXE)*
- *Fixed Disk Presentation Manager Utility (FDISKPM.EXE)*, replaced by *Logical Volume Manager Graphical User Interface (LVMGUI.CMD)*
- *Java 1.0*, replaced by *Java 1.1.7*
- *Pulse*, replaced by *CPU Monitor (CPUMON)*
- *LAN Distance*, replaced by *Remote Access Services*
- *SystemView Agent (Netfinity TME 10)*, replaced by *Tivoli Management Agent (TMA)*

The following components, previously installed with OS/2 Warp or OS/2 Warp Server, are not part of OS/2 Warp Server for e-business:

- *Password Coordinator*
- *Network Signon Coordinator*
- *BonusPak*
- *OS/2 Warp Tutorial*
- *OpenDoc*
- *WarpGuide*
- *VoiceType*
- *Hibernate* (Trapdoor)
- *Novell NetWare Client for OS/2*
- *Dual boot* is not supported
- *Easy Path* installation
- *Mobile File Sync*
- *PCOMM Lite 4.1*
- *Keyworks*
- *HP JetAdmin*
- Installation from diskettes, replaced by installation from CD
- Remote client installation is not supported

Chapter 2. Requirements for the Server

Prior to installing OS/2 Warp Server for e-business, make sure you have the required hardware and software and that your hardware is supported by OS/2 Warp Server for e-business.

Supported Hardware

You can find the most current information on supported hardware and additional device support on the Internet at the following address:

`http://www.software.ibm.com/os/warp/support`

The Personal Computer Manufacturer (PCM) table lists systems that have been tested and verified to work with OS/2. The PCM table is available at the following address:

`http://www.software.ibm.com/os/warp/hw-cert`

New hardware that becomes available after OS/2 Warp Server for e-business is installed can be supported with modifications to the diskettes used to start the installation process. You can find the most current information on additional device drivers on the Internet at the following address:

`http://service.software.ibm.com/os2ddpak/index.htm`

See “Modifying the Installation Diskettes for New Hardware” on page 74 to add a device driver to the installation diskettes or to replace a driver that was included on the diskettes.

System Requirements

To install OS/2 Warp Server for e-business and use its services on the server, you need *at least* the following minimum hardware:

- One or more Intel-compatible Pentium or higher processors with a speed of at least 133 MHz.

  Note: A multiprocessor system must either comply with the Intel Multiprocessor Specification, Version 1.4 or 1.1, or it must be one of the following computers, each of which has its own proprietary SMP architecture:
  - Compaq Proliant 2000
  - Tricord PowerServer, models 30 and 40
  - IBM PC Server 720
- A minimum of 32MB of random access memory (RAM), but 64MB or more provides better performance, depending on which services are installed.

- A minimum of 120MB of available hard disk space for the base operating system. A minimum of 200MB is required for the base operating system and all default installation items. A total of 500MB is recommended for a typical installation, depending on which services and components are installed. For installation requirements of services and components, see the table in “Hard Disk Space Requirements”.
- A 1.44MB, 3.5-inch diskette drive, configured as drive A.
- A 640 x 480 (16-color) or higher resolution VGA display.
- An IBM-compatible mouse.
- A CD-ROM drive supported by OS/2.
- A LAN adapter card supported by MPTS.
- Remote Access Services requires the supported remote access adapters, which are a subset of the supported MPTS LAN adapters.
- A modem that supports speeds of 9600bps or higher, if you plan to use Remote Access Services.
- An Internet-enabled LAN or a modem, if you plan to use the Internet.

Hard Disk Space Requirements

Note: The requirements in this section are based on information available at publication time.

Service	Number of Megabytes (MB)
Default installation: OS/2 base operating system plus default components	120.0
All optional OS/2 components	180.0
File and Print Sharing Services	15.0
TCP/IP Services	30.0
Remote Access Services	6.0
Netscape Communicator	11.0
Tivoli Management Agent	1.5
Personally Safe ’n’ Sound	7.2
LDAP Services Toolkit	4.2
Advanced Print Services	54.0
First Failure Support Technology (FFST) 1.2	0.1
Online Books	10.0
Total (if all components and services are installed)	439.0

Keyboards Supported during Installation

For SBCS versions of OS/2 Warp Server for e-business, code page 850 is the only code page that is supported during the first phase of the installation process or if you start the system from utility diskettes. As a result, you must select one of the Latin-1 keyboards, even if you normally select a non-Latin-1 keyboard. You can still set the country code to any valid country. This setting may affect the default country and keyboard settings used later in the installation process, including those used by the Logical Volume Management Tool (LVM), and for command line processing when the system is booted from utility diskettes. However, later in the installation, you can specify your preferred country and keyboard settings.

The following keyboards are supported during the first phase of OS/2 Warp Server for e-business installation:

Country Code	Country Name
be	Belgium
br	Brazil
cf	Canadian French
dk	Denmark
fr	France
gr	Germany
it	Italy
la	Latin America
nl	Netherlands
no	Norway
sf	Swiss French
sg	Swiss German
sp	Spanish
su	Finland
sv	Sweden
uk	United Kingdom
us	United States
ux	US International

Display and Graphics Adapter Considerations

The installation program automatically detects graphics adapters or chips in your system, and it automatically selects an appropriate graphics driver. If your graphics adapter is not recognized, the installation program defaults to a driver that supports VGA mode only (640 x 480 resolution with 16 colors). If that happens, you can find instructions on how to obtain and install support specifically for your adapter from *OS/2 Device Driver Pak Online* at the following address:

http://service.software.ibm.com/os2ddpak/index.htm

If you find no specific driver for your graphics adapter, consider installing the *Generic VESA Unaccelerated GRADD (GENGRADD)* to obtain Super VGA resolutions and color support.

If you experience video problems after you have installed a graphics device driver, use the following steps to correct the problem:

1. Restart the system.
2. When the white band **OS/2** is displayed in the upper-left corner of the screen, press Alt+F1.
3. Press F3 to reset the system to VGA mode.

Ensure that your display is capable of synchronizing to the refresh rates that your graphics adapter is capable of setting. Some graphics adapters implement an EEPROM, which may be programmed with specific refresh timings for each resolution. Verify that these timings are compliant with your monitor's capabilities prior to installation. This verification is generally a matter of running the adapter utility that accompanied the adapter card or system unit.

For example, ATI Mach32 adapters should be configured to run at 60Hz VGA resolution (640 x 480, 16-color resolution) prior to installation.

Chapter 3. Preinstallation Planning

Before installing OS/2 Warp Server for e-business, you should be familiar with concepts and terminology related to installation, including Logical Volume Manager, Journaled File System, and information about selecting a file system.

While "Chapter 1. Overview of OS/2 Warp Server for e-business" on page 1 gave you an overview of the product, this section explains new concepts in greater detail, allowing you to make informed decisions about configuring your network before you begin installation.

Review the following concepts and terminology before you install OS/2 Warp Server for e-business:

- "Terminology"
- "Boot Manager" on page 15
- "Logical Volume Manager" on page 15
- "File System Descriptions" on page 20

Terminology

Before you install OS/2 Warp Server for e-business, you should be familiar with the terminology listed below:

Active partition
: The one primary partition that has the boot indicator set in the master boot record. 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.

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 small 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 Logical Volume Manager (LVM) utilities do not display or directly allow configuration of extended partitions. Operations on logical partitions are automatically performed within an extended partition.

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. In OS/2 Warp Server for e-business, a volume can be formatted for use by JFS, 386 HPFS, HPFS, or FAT file systems. Note that volumes cannot be formatted within the LVM utility.

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 may have a label, or name, assigned to it. A hard disk can be divided into one or more partitions.

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, it can be installed on a logical partition as long as Boot Manager is installed on the active (bootable) primary partition.

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

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

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.

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 may contain one or more partitions, and it may have a label, or name, assigned to it. A logical volume may 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. See “Logical Volumes” on page 17 for more information about these types of volumes.

Boot Manager

Boot Manager allows you to install more than one operating system on the same hard disk. A system configured with Boot Manager displays a menu at startup that allows you to choose which operating system to boot from. Each operating system resides in its own volume.

To install and set up Boot Manager, you must use the Logical Volume Management Tool (LVM). This can be done during installation.

If Boot Manager is not installed, then the installable volume must be set to C:.

You should install the base operating system into its own volume (set as installable), so that if reinstallation becomes necessary, you can format the volume and then install the operating system to the newly formatted volume without affecting applications and data.

Logical Volume Manager

Logical Volume Manager (LVM) is a set of new OS/2 disk management functions and utilities. LVM allows user configuration of physical and logical volumes (usually referred to as *drives* in previous versions of OS/2) with much greater flexibility than before. Features such as *persistent drive letters*, *dynamic drive letter assignment*, *disk spanning*, and *dynamic volume expansion* greatly reduce downtime when disk configuration changes are made on a server.

LVM Utilities

The *Logical Volume Management Tool (LVM.EXE)* is used to configure new LVM features as well as perform basic partitioning functions, which were done with the Fixed Disk Utility (FDISK.COM) in previous versions of OS/2.

A new Java application, *Logical Volume Manager Graphical User Interface (LVMGUI.CMD)*, likewise replaces the previous FDISK Presentation Manager utility (FDISKPM.EXE).

The utilities FDISK and FDISKPM are not included with OS/2 Warp Server for e-business.

Note: After volumes have been created with LVM, FDISK should no longer be used to manage partitions.

The following chart illustrates the differences between drives as they were defined by FDISK and drives as they are defined by LVM. Note that with FDISK, a *partition* is equivalent to a drive. However, with LVM, a *volume* is equivalent to a drive.

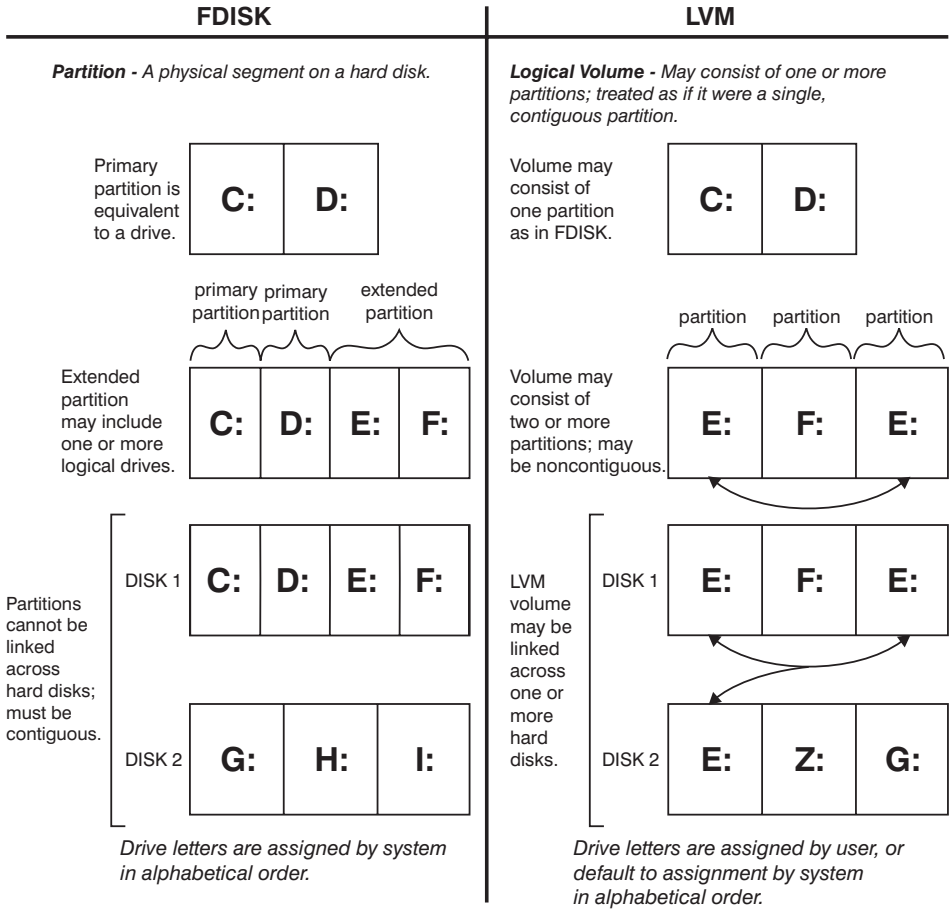

Figure 1. Comparison chart of FDISK and LVM concepts.

Starting the LVM Utilities after Installation

For your convenience, volume management and configuration functions are available with three LVM interfaces: text mode window, graphical user interface (GUI), and command line. The table below lists the three interfaces, how to access each interface after installation is completed, and where to find more information about performing volume management tasks in each interface.

Table 1. Logical Volume Manager Interface Options

LVM Interface Type	How to start LVM after installation is complete	Where to find additional LVM task information
Text mode window	1. Open an OS/2 window. 2. Type `lvm` and press Enter.	"Chapter 5. Creating and Managing Volumes and Hard Disk Partitions" on page 53

Table 1. Logical Volume Manager Interface Options (continued)

LVM Interface Type	How to start LVM after installation is complete	Where to find additional LVM task information
Graphical user interface (GUI)	1. Open the OS/2 System folder on the Desktop. 2. Open System Setup. 3. Double-click the Logical Volume Manager icon. or 1. Open an OS/2 window. 2. Type `lvmgui` and press Enter.	*Network Administrator Tasks*
Command line	1. Open an OS/2 window. 2. Type `lvm` followed by command line parameters and press Enter. For information about valid parameters, type `help lvm` and press Enter to display the *Command Reference*.	*Command Reference*

Logical Volumes

A *logical volume* is one or more partitions with an associated drive letter. It is treated as if it were a single, contiguous partition. Volumes have persistent drive letters associated with them. Partitions that are not part of a logical volume have no associated drive letter and cannot be accessed by applications. You can create two types of logical volumes with LVM: compatibility volumes and LVM volumes. Each volume created by LVM has a *volume designation*.

- "Compatibility Volumes"
- "LVM Volumes"
- "Volume Designations" on page 18

Compatibility Volumes

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, and it can be made bootable. When you install OS/2 Warp Server for e-business, you will create a compatibility volume and set it *installable* to be the target for installation.

LVM Volumes

An *LVM volume* is a new type of volume that is not recognized or accessed by previous versions of OS/2 or other operating systems.

Volume Designations

Four types of volume designations are possible with LVM: bootable, installable, nonbootable, and startable.

Bootable

Bootable is a volume designation, used by Logical Volume Manager, indicating that the volume contains a bootable operating system. When a bootable volume is created, it is automatically added to the Boot Manager menu. For example, if you have two operating systems installed in two different volumes on your computer, you can designate each volume as bootable. Then, using Boot Manager, you can select which of the volumes to boot. Note that bootable volumes exist only when Boot Manager is present; otherwise, the bootable volume is designated as *startable*.

A bootable volume can be used to boot an operating system from Boot Manager.

Installable

Installable is a volume designation, used by Logical Volume Manager during installation, indicating that OS/2 Warp Server for e-business will be installed on the volume. Only one volume can be set as installable.

Nonbootable

Nonbootable is a volume designation, used by Logical Volume Manager, indicating that the volume contains nonbootable data rather than a bootable operating system. For example, you might have an operating system installed in one volume on your computer, and you might save your data in another volume. To ensure that the system can be properly booted by the hardware, you would designate the volume that contains the operating system as *bootable* and designate the volume that contains your data as *nonbootable*. Because some systems do not support booting beyond certain hard disk limits, specifying a volume as nonbootable allows you to make use of those areas for data.

A nonbootable volume cannot be used to boot an operating system from Boot Manager.

Startable

Startable is a volume designation, used by Logical Volume Manager, indicating the volume that is used when the computer starts. A startable volume must contain either Boot Manager or a bootable operating system. For example, if Boot Manager is installed, it is automatically set as the startable partition, and the Boot Manager menu is displayed when the computer starts. If Boot Manager is not installed, you must set, as startable, a volume that contains an operating system. Then, when you turn on your computer, that operating system will start automatically.

Only one volume or partition can be set startable.

A startable volume is the primary partition that is used to start the system, by virtue of being the active partition.

Volume Type Comparison

The following chart compares characteristics of compatibility volumes and LVM volumes.

Table 2. Comparison of Compatibility Volumes and LVM Volumes

Characteristic	Compatibility Volume	LVM Volume
Can be set installable, startable, or bootable	Yes	No
Maximum size	Size of disk device (the actual usable size may be limited by the intended file system)	2TB (terabytes)
Allowable file systems	386 HPFS, HPFS, FAT	JFS, 386 HPFS, HPFS, FAT
Can span multiple partitions and disks	No	Yes
Expandable	No	Yes, if formatted with JFS, or if unformatted
Supports Fault Tolerance feature of 386 HPFS	Yes	No
Partition ID values (for more information about this topic, see Appendix B of *Storage Device Driver Reference for OS/2, S71G-1897*)	x'06' (16-bit FAT > 32MB) x'07' (Installable File System)	x'35' (OS/2 Logical Volume Manager)

Disk Spanning

Disk spanning can be thought of as drive linking. It allows you to link multiple partitions on multiple physical disks (hard disks) into a single, LVM volume. Disk spanning allows you to create any size LVM volume by linking multiple physical disks together. The LVM volume appears as one drive letter, compatible with all file operations presently used.

Dynamic Volume Expansion

Dynamic volume expansion allows you to increase the size of an LVM volume to accommodate additional needed capacity without affecting the data already on the volume. Expansion works only with JFS, not other file systems. The LVM volume expands when you link additional partitions (which can be on the same physical disk or on other physical disks). Additional space is always added to the end of the current LVM volume space.

Dynamic Drive Lettering

Dynamic drive lettering allows you to manage drive letters on LVM volumes and compatibility volumes without having to restart the system under most circumstances. Previous OS/2 implementations statically allocated the number of drives at boot time, forcing you to restart the system whenever you added or deleted drives.

Persistent Drive Letters

After you to assign a drive letter to a new LVM volume or compatibility volume, that drive letter will remain persistent until you explicitly change it or delete the volume. This function prevents problems resulting from drive order changing with repartitioning or adding new hardware.

For example, if you add a new hard disk and configure it as a new volume, you can assign a drive letter later in the alphabetic sequence than the CD-ROM drive letter, thus preventing the CD-ROM drive letter from changing. If you invoke the **NET USE** command to access LAN drives, you can assign a letter to the new volume later in the alphabetic sequence than any preferred LAN drive letters, even if the drive letters are not in use at the time you run **LVM.EXE** or **LVMGUI.CMD**.

Note: Drive letters should not be changed where the operating system or any of its components reside. If you change a drive letter on a volume that has files open, you must restart the system after you exit LVM. Changing a drive letter may also cause problems with applications that require **LIBPATH** entries or use hard coded paths.

File System Descriptions

A file system is the software implementation of a method for managing user data on a disk or other medium. It is the part of the operating system that provides access to data and programs on a disk. Each type of *Installable File System* (IFS) has implementation-specific details, such as directory formats and file layouts.

The following file systems are explained below:

- "Journaled File System (JFS)"
- "High Performance File System (HPFS)" on page 23
- "386 High Performance File System (386 HPFS)" on page 23
- "FAT File System" on page 23

Refer to "Appendix A. File System Comparison Chart" on page 85 for a side-by-side comparison of file system characteristics.

Journaled File System (JFS)

The Journaled File System (JFS) is a file system that uses database journaling techniques, such as recording file changes sequentially, to maintain file system integrity. JFS provides a high-performance, 32-bit file system implementation for the OS/2 Warp Server for e-business environment. JFS is tailored primarily for the high throughput and reliability requirements of servers from single processor systems to advanced multiprocessor and clustered systems where performance and reliability are desired.

JFS uses the proven technology of the existing AIX JFS implementation, and it is enhanced to provide support for extended attributes, unicode names, and case-insensitive searches. Also, a number of significant features are added to JFS to make it more competitive and scalable, resulting in fundamental changes to the file system layout. These features include extent-based allocation, sorted directories, and dynamic space allocation for file system objects.

Additional features of JFS include:

- The ability to create and maintain volumes up to 2TB (terabytes) in size, in contrast to the 386 HPFS and HPFS limit of 64GB and the FAT limit of 2GB.
- File sizes of up to 2TB, while 386 HPFS, HPFS, and FAT allow file sizes of 2GB.
- Compatibility with applications already using 386 HPFS and HPFS.
- Improved recovery time from system failures by using journaling techniques.
- Dynamic volume expansion in conjunction with LVM, resulting in improved file system scalability compared to the other file systems.

Note: The Journaled File System can be used only on LVM volumes, and therefore is not bootable. See “Volume Designations” on page 18 for more information about bootable volumes.

Journaling Techniques

JFS provides improved structural consistency, recoverability, and much faster restart times than current nonjournaled file systems, such as 386 HPFS, HPFS, FAT, and traditional UNIX file systems. File systems are subject to corruption in the event of system failure because a logical file operation takes multiple media reads and writes to accomplish, and the operation may not be totally reflected on the media at any given point in time. These other file systems rely on restart-time utilities, such as **CHKDSK**, which examine all of a file system’s meta-data to detect and repair structural integrity problems. This is a time-consuming and error-prone process which, in the worst case, can lose or misplace data.

In contrast, JFS uses techniques originally developed for databases to log information about operations performed on file system meta-data as *atomic transactions*. An atomic transaction is one that allows a function to be completed or to return to its original state if a power interruption or abnormal end occurs. In the event of a system failure, a file system is restored to a consistent state by replaying the log and applying log records for the appropriate transactions. The recovery time associated with this log-based approach is much faster because the replay utility need only examine the log records produced by recent file system activity, rather than examine all file system meta-data.

Variable Block Size

JFS supports block sizes of 512, 1024, 2048, and 4096 bytes on a per volume basis, allowing you to optimize space utilization based upon your application environment. Smaller block sizes reduce the amount of internal fragmentation within files and directories, and they are more space efficient. However, small blocks can increase path length because block allocation activities may occur more often than if a larger block

size was used. The default block size is 4096 bytes because performance, rather than space utilization, is generally the primary consideration for server systems.

Object Names

Unicode File Names and Directory Names: JFS is enabled for National Language Support (NLS) and will store and manipulate all file and directory names that it manages as strings of unicode characters. This storage method guarantees that directories are correctly sorted no matter which code page is used during a particular file system session. Thus, JFS provides the performance benefits of sorted directories while being enabled for full multinational access.

Case Sensitivity: JFS supports case for names in a fashion consistent with the HPFS implementation. Names are stored and returned as received (case is preserved), but case is ignored during directory searches.

Maximum File Name and Directory Name Length: Like HPFS, JFS limits the length of a file or directory name to 254 unicode characters. This satisfies the requirements of existing OS/2 applications.

JFS supports path names of up to 260 characters in length. This limit is imposed by the Installable File System Manager (IFSM).

Online File System Expansion

JFS supports the expansion of a mounted and actively accessed volume. Should a JFS logical volume run out of space, you can increase the volume's size without the disruption of backing up the contents, reformatting the volume, and then restoring the contents.

Online Free Space Defragmentation

JFS supports the defragmentation of free space in a mounted and actively accessed volume with the **DEFRAGFS** utility. When a volume's free space has become fragmented, defragmenting the file system allows JFS to provide more I/O-efficient disk allocations and to avoid some out of space conditions.

Sparse and Dense File Support

JFS supports both sparse and dense files on a per volume basis. Sparse files and dense files are read similarly, but they are written differently.

A successful read operation returns a block of data. If the block that is read has not been written to, then JFS returns a block of zero-filled bytes (a buffer full of binary zeros, or nulls). This is true for both sparse and dense files.

Sparse files allow data to be written to random locations within a file without allocating *previously unwritten intervening file blocks* (blocks in the file that are placed before the highest block written, but that have not been written to themselves). For example, if you

create a file and it is written to block 100, then blocks 0 through 99 are considered previously unwritten intervening file blocks until you explicitly write to them. If the file system is formatted for sparse files, then 1 block is allocated.

With sparse files, the file size reported is the highest byte that has been written, but the actual allocation of any given block in the file does not occur until a write operation is performed on that block.

Sparse files are of interest to applications that require a large, logical space, but use only a small subset of this space.

For *dense files*, disk resources are allocated to cover the file size. In the above example, the first write (a block of data to block 100 in the file) causes 100 blocks of disk space to be allocated to the file. In other words, if the system is formatted for dense files, then 100 blocks are allocated.

Because OS/2 applications most commonly use dense files, a new volume is designated for dense files by default.

High Performance File System (HPFS)

HPFS file name rules are more flexible than those of FAT, allowing you to create more descriptive file names. HPFS allows file names of up to 254 characters. Spaces and periods are also allowed.

HPFS has features that make it a better choice than FAT for larger volumes, up to 64GB. HPFS puts the directory at the seek center of the volume and is designed to allocate contiguous space for files, thus helping to prevent disk fragmentation. Use HPFS instead of FAT on larger volumes because the savings in disk space is dramatic.

386 High Performance File System (386 HPFS)

386 HPFS is a server-optimized variant of HPFS. It provides improved access to large disk volumes, and it optimizes performance in a server environment where many files are open simultaneously from clients.

You must install OS/2 Warp Server for e-business before you install 386 HPFS. 386 HPFS is available as a separate feature. For information about 386 HPFS, see the README on the 386 HPFS Upgrade for OS/2 Warp Server for e-business CD.

FAT File System

The *File Allocation Table (FAT)* file system is a file system compatible with DOS. FAT file systems have a file allocation table that keeps track of the files and their locations on the hard disk. File names cannot exceed 8 characters, and the file name extension cannot exceed 3 characters. A period is always required between the file name and the extension. Spaces are not allowed, and fewer nonalphanumeric characters are allowed compared to other file systems.

Select the FAT file system if you intend to share data in the volume with a version of DOS that is running independently of OS/2 Warp Server for e-business. For example, if you occasionally need to start DOS from a diskette and access the data on a OS/2 Warp Server for e-business volume, that volume must be formatted for the FAT file system. DOS uses the FAT file system and does not recognize files created by JFS, 386 HPFS, or HPFS. Although a copy of DOS running in native mode does not recognize the other file systems, this is not true for DOS sessions that run under OS/2 Warp Server for e-business. If you plan to run your DOS programs in the DOS sessions that are part of OS/2 Warp Server for e-business, you can format for any file system. However, the programs running in these DOS sessions will not recognize the longer file names supported by JFS, 386 HPFS, and HPFS.

Considerations for Sharing Files in a Multinational Environment

In today's global business environment, there is a critical need for fast access to all files within a directory, regardless of the language character set (code page) used to create the file originally or the code page being used by the system at the time the search for the file is conducted.

The concept of *multinational sharing of files* is that individual files may be created using one code page (language character set) and accessed using a different code page.

In contrast to 386 HPFS, HPFS, and FAT, JFS stores all file and directory names in unicode. This storage method guarantees that directories are correctly sorted no matter which code page is used during a particular file system session. Thus, JFS provides the performance benefits of sorted directories while being enabled for full multinational access.

If HPFS files created using different code pages reside within a single directory, HPFS may be unable to maintain the directories upon which its search algorithms depend. When this problem arises, some files in such a directory may become inaccessible.

FAT file systems tolerate multinational access well because they do not maintain sorted directories. However, the performance cost of unsorted directory structures prevents FAT from being a viable alternative for most software environments.

Chapter 4. Installing and Configuring the Server

This section provides guidance for installing OS/2 Warp Server for e-business on a server or hard disk without any existing disk partitions or operating systems. Limited guidance is available for installing OS/2 Warp Server for e-business on a system with existing partitions or operating systems. Refer to *Migrating to OS/2 Warp Server for e-business, SG24-5135* for detailed information about migrating your existing system to OS/2 Warp Server for e-business.

As you begin the server installation process, you will find that the online help screens provide most of the guidance you need. You can view the help screens at any time during the installation process by pressing F1. This section is intended to supplement the help screens by providing additional conceptual information along with the procedures.

The following tasks comprise the installation process:

1. "Preparing the System" on page 27
    a. "Selecting the Installation Volume" on page 28
    b. "Formatting the Installation Volume" on page 32
2. "Installing and Configuring Hardware and Software Options" on page 33
3. "Installing and Configuring Server Components" on page 46

The table below lists additional resources about installing OS/2 Warp Server for e-business:

For information about	Refer to
Installing to a system without existing partitions or without an existing operating system	"Preparing the System" on page 27
Installing to a system with existing partitions or with an existing operating system	"Installing to a System with Existing Partitions or Operating Systems" on page 26
Creating installation diskettes	"Creating Installation Diskettes" on page 73
Adding device drivers to the installation diskettes	"Modifying the Installation Diskettes for New Hardware" on page 74
Installing to a system with removable media	"Appendix C. Partitioned Removable Media Considerations" on page 95
Installing to a laptop system	"Installing to a Laptop System" on page 93
Remote IPL	*Network Administrator Tasks*
DCHP Boot	*Network Administrator Tasks*
Migrating your system	*Migrating to OS/2 Warp Server for e-business, SG24-5135*
Installing using the CID method	*Migrating to OS/2 Warp Server for e-business, SG24-5135*

For information about	Refer to
Troubleshooting installation problems	“Appendix B. Troubleshooting Installation Problems” on page 89 or *Serviceability and Troubleshooting Guide* or README.TXT

Installing to a System with Existing Partitions or Operating Systems

On systems that already contain partitioned hard disks or existing operating systems, selection options may be different, and additional steps may be necessary. Review the following topics before installing OS/2 Warp Server for e-business to a system with existing partitions or operating systems:

- “CHKINST System Checking Utility”
- “LVM Volume Conversion Utility (VCU)” on page 27

CHKINST System Checking Utility

The **CHKINST** utility *(CHKINST.EXE)* checks the system prior to installation to determine what preparation is required and then reports the results.

Run the CHKINST utility before installing OS/2 Warp Server for e-business if you are installing to a system with existing partitions or operating systems.

To run the CHKINST utility at a command prompt:

1. Place the *OS/2 Warp Server for e-business CD* in the CD-ROM drive.
2. Type `e:\chkinst /t:s: /l1:c:\filename.log`, where *e:* is your CD-ROM drive letter, *s*: is the planned installation volume, and *c:**filename.log* is the full path and file name where CHKINST will create an output log file. CHKINST sends its results to the display and to the specified file.

CHKINST performs the following system checks:

- Detects components in use that you must remove prior to installation if you choose not to format the installation volume. Such components include LAN Distance, IBM Peer, Local Security, and 386 HPFS access controls, if present.
- Detects components that are not supported by OS/2 Warp Server for e-business that may cause the operating system to fail, and then issues a warning message stating that the components will be removed. Such components include OpenDoc, AskPSP, and TrueMode.
- Detects components that are not supported by OS/2 Warp Server for e-business that will likely *not* cause any failures if they remain on the system, issues a warning message, and reports the files that have a current replacement. No configuration file information is migrated for these components. Such components include OS/2 Tutorial, IBM Works, and VoiceType.
- Logs each item found and includes a drive letter, if applicable.

See the *Command Reference* for additional examples about using the CHKINST utility.

Note: Refer to *Migrating to OS/2 Warp Server for e-business, SG24-5135* for detailed information about using the CHKINST utility and how to remove certain components when you are upgrading your system.

LVM Volume Conversion Utility (VCU)

The LVM *Volume Conversion Utility (VCU)* is executed during installation to convert existing partitions into LVM compatibility volumes and to replace Boot Manager if it is already installed. Under some conditions VCU may detect inconsistencies in your current partitioning that are incompatible with LVM, and the installation will stop to ask if you want to proceed. VCU may also make certain changes that require the system to be restarted, and it will issue a message informing you to do so. For more information about VCU messages, see "VCU Has Detected Corrupt Partitions" on page 89.

For detailed migration information, see *Migrating to OS/2 Warp Server for e-business, SG24-5135*.

Preparing the System

This phase of installation determines whether the target system meets the prerequisites for installing the operating system. It also makes the volume selected for installing the operating system *bootable* and prepares the hard disk for installation, formatting if necessary. Necessary files are copied, and then the system is restarted.

A bootable CD is included with OS/2 Warp Server for e-business. You can use the *Server Pak Installation CD* to start the system and begin the installation process. Because some systems might require bootable diskettes instead of a bootable CD, you can create installation diskettes to start the system and begin the installation process. See "Creating Installation Diskettes" on page 73 for instructions.

Starting the Installation with a CD

To begin the installation process:

1. Gather the *OS/2 Warp Server for e-business Server Pak Installation CD* and the *Server Pak CD*.
2. Insert the *Server Pak Installation CD* into the CD-ROM drive.
3. Turn on or restart the system.
4. Follow the prompts on the screen as directed. For more information, refer to the online help screens by pressing F1.

Starting the Installation with Diskettes

Note: You must create installation diskettes before following these steps. See "Creating Installation Diskettes" on page 73 for instructions.

To begin the installation process:

1. Gather the *OS/2 Warp Server for e-business Installation Diskette*, *Diskette 1*, *Diskette 2*, and the *Server Pak CD*.
2. Insert the *Installation Diskette* into the diskette drive.
3. Insert the *Server Pak CD* into the CD-ROM drive.
4. Turn on or restart the system.
5. Follow the prompts on the screen as directed. For more information, refer to the online help screens by pressing F1.

Selecting the Installation Volume

When the **Installation Volume Selection** screen is displayed, you can choose to accept the default volume or to specify a different volume.

At this time you might want to consider other changes in the volume configuration, even if the default installation volume is acceptable. For example, you might decide to create some data volumes or to assign a different drive letter to the CD-ROM device. New volumes do not need to be formatted now, but creating them will establish drive letters. If Boot Manager is not already installed, you might want to add it now.

If, for any reason you want to run the Logical Volume Management Tool now, select **Specify a different volume** instead of **Accept the default volume**.

- Select **Accept the default volume** if you want to install OS/2 Warp Server for e-business on the volume that is displayed. See “Accepting the Default Installation Volume” for information about accepting the default installation volume.
- Select **Specify a different volume** if you want to install OS/2 Warp Server for e-business on a volume other than the one that is displayed. In addition, select this option if you have multiple primary partitions set up on your hard disk, so you can verify that the correct partition or volume is active. See “Setting the Installation Volume with Logical Volume Manager” on page 29 for information about setting the installation volume.

  If Boot Manager is not already installed and you want to install it now, select this option. If you plan to keep your existing operating system on one volume and install OS/2 Warp Server for e-business on a new volume, you must install Boot Manager. For more information about installing Boot Manager, see “Installing Boot Manager” on page 63.

Accepting the Default Installation Volume

If you choose to accept the default installation volume, OS/2 Warp Server for e-business will be installed to the volume specified. Next, the **Formatting the Installation Volume** screen is displayed. For help with formatting the installation volume, see “Formatting the Installation Volume” on page 32.

Setting the Installation Volume with Logical Volume Manager

When compatibility volumes are modified, all data on those volumes is deleted. Be sure to back up all existing data before you modify a volume. Press Enter to continue the installation, or press F3 to exit the installation and back up your data.

A message indicating the minimum volume size for installation is displayed; however, you should define the installation volume greater than the minimum, depending on which components you plan to install. See “Hard Disk Space Requirements” on page 10 for information about hard disk space requirements for OS/2 Warp Server for e-business. Press Enter to start the Logical Volume Management Tool.

The LVM logical view is displayed, showing any existing volumes. You can either create a new volume to be the installation volume, or you can select an existing volume to be the installation volume.

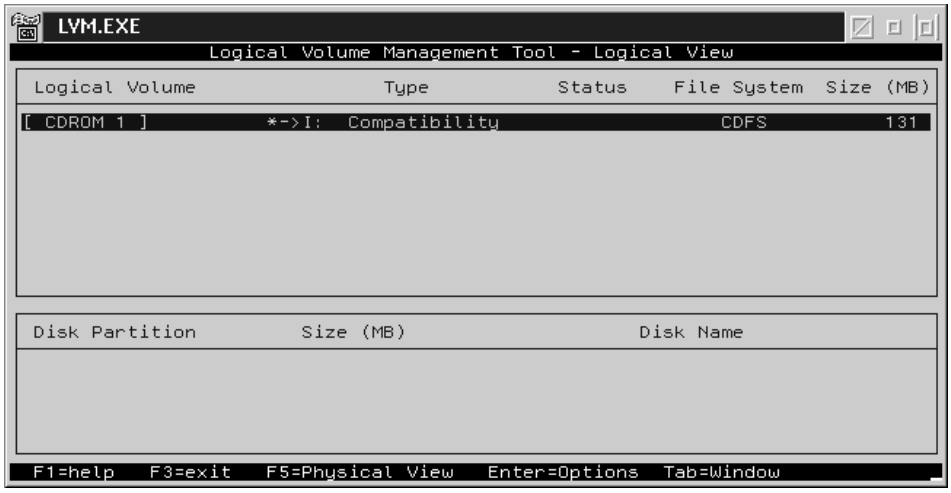

Figure 2. The LVM logical view displays any existing volumes, including CD-ROM drives.

If you wish to create a new volume to be the installation volume, see “Creating a New Volume to be the Installation Volume” on page 30.

If the existing partition or volume on which you want to install the product is not set as *installable*, see “Selecting an Existing Volume to be the Installation Volume” on page 31 for instructions.

If you wish to create other volumes, such as LVM volumes to format for JFS, see “Creating a Nonbootable Volume” on page 62, and then continue with installation.

Note: Be sure to record the drive letters of any LVM volumes you create. You will need to know the drive letters when you format the volume for JFS.

Creating a New Volume to be the Installation Volume: To create a new volume to be the installation volume:

1. Press Enter to display the **Options** menu.
2. Highlight **Create a new volume** and press Enter.
3. Highlight **Create a volume that can be made bootable** and press Enter.
4. Highlight a drive letter from the list and press Enter.
5. Type the new volume name in the space provided and press Enter twice.
6. Highlight a hard disk on which to create the volume and press Enter.
7. Highlight **Allocate from free space** and press Enter.
8. Highlight the free space block you want and press Enter.
9. Enter a name for the partition that will be included in the new volume and press Enter.
10. Enter a size, in megabytes, for the partition and press Enter.

    The new volume is displayed in the LVM logical view.
11. Highlight the volume you just created.
12. Press Enter to display the **Options** menu.
13. Highlight **Set the volume installable** and press Enter.

    When a volume is set installable, the word *installable* is displayed in the **Status** column.
14. Press F3 to exit LVM.
15. Highlight **Save the changes and exit** and press Enter.

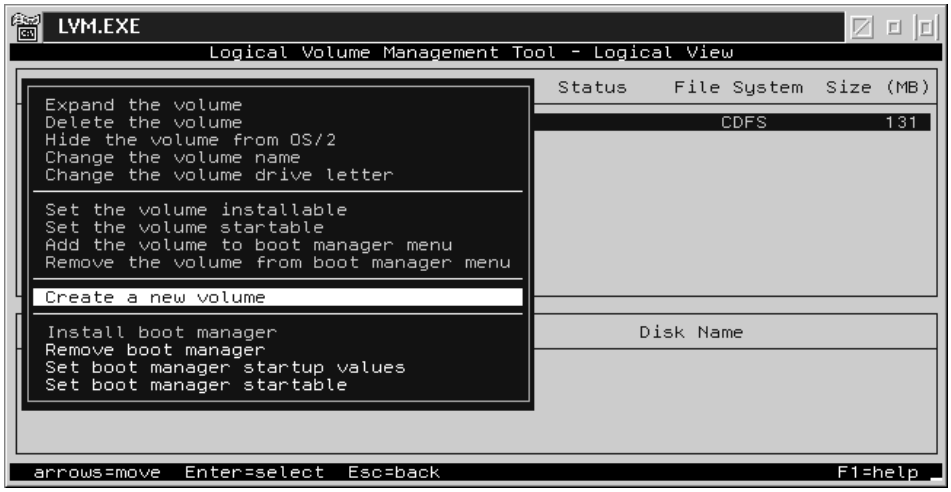

Figure 3. In the LVM logical view, press Enter to display the **Options** *menu.*

The disk partitioning is completed. If you are prompted to restart the system so that the partitions and volumes can be recognized during installation, follow the prompts on the screen to restart the system and continue installation.

After the system is restarted, follow the prompts until the **Installation Volume Selection** screen is displayed. Make sure that the correct installation volume is displayed, and then select **Accept the default volume**.

After you have selected the installation volume, the **Formatting the Installation Volume** screen is displayed. For help with formatting the installation volume, see “Formatting the Installation Volume” on page 32.

Selecting an Existing Volume to be the Installation Volume: When a volume is set installable, the word *installable* is displayed in the **Status** column.

To select an existing volume to be the installation volume:

1. Select the volume that you want to set installable by using the arrow keys to highlight it.
2. Press Enter to display the **Options** menu.
3. Highlight **Set the volume installable** and press Enter.

   When a volume is set installable, the word *installable* is displayed in the **Status** column.
4. Press F3 to exit LVM.
5. Highlight **Save the changes and exit** and press Enter.

The **Installation Volume Selection** screen is displayed. Make sure that the correct installation volume is displayed, and then select **Accept the default volume**.

After you have selected the installation volume, the **Formatting the Installation Volume** screen is displayed. For help with formatting the installation volume, see "Formatting the Installation Volume".

Formatting the Installation Volume

The volumes on a hard disk must be formatted before data can be stored there. If the volume on which you will install OS/2 Warp Server for e-business has already been formatted by DOS or OS/2, it is not necessary to format it again, unless the volume is too small to accommodate OS/2 Warp Server for e-business.

Formatting a hard disk erases all files that currently reside there. If you need the existing files, be sure to back up the files before you format the volume.

Select one of the following three options to format the installation volume:

1. **Do not format the volume**. If you select this option, the volume is not formatted. Instead, the program adds OS/2 Warp Server for e-business files to the files that already exist on the volume. The existing files either remain intact or are replaced.
2. **Perform a long format**. If you select this option, the volume is formatted with the file system that you will select. This option formats *each sector* on the volume to a known state consistent with the file system you select. Generally, you should perform a long format when you are formatting a volume for the first time, if you are reformatting a volume with a different file system, or if you are installing an operating system to the volume.
3. **Perform a quick format**. If you select this option, the volume is formatted with the file system that you will select. This option formats only the *boot sector* and the *directory sectors* on the volume to a known state. The remaining sectors are not touched. Therefore, the old data still exists, but it is not visible. The existing data is overwritten by the new files as they are allocated. Generally, you should perform a quick format if you are reformatting a volume with the same file system.

If you select either **Perform a long format** or **Perform a quick format**, the **Select the File System** screen is displayed. For help on selecting the file system, see "Selecting the File System".

Selecting the File System

During this point of the installation process, the installation volume can be formatted to use the High Performance File System (HPFS) or the File Allocation Table (FAT) file system. It is recommended that you use HPFS for the installation volume.

The base operating system cannot be installed on a volume formatted for the Journaled File System (JFS) because JFS volumes are not bootable. Some components, however, can be installed to other volumes, and these volumes can generally be formatted for JFS, HPFS, or FAT, unless restricted by the individual component. See "Formatting a Volume for a File System after Installation" on page 72 for information about formatting a volume with a file system after installation.

Select a file system for the installation volume:

1. High Performance File System (HPFS)
2. File Allocation Table (FAT) file system

If you want to format a volume with JFS during installation, see “Formatting a Volume for JFS during Installation” on page 39.

After the volume is formatted, system files are copied from the *Server Pak CD* to the server.

If you are using the *Server Pak Installation CD*, the system is automatically restarted, and installation is continued.

If you are using installation diskettes, remove the diskette when prompted, and then press Enter to restart the server and continue installation.

When the server is restarted, the **System Configuration** window is displayed. For help about configuring hardware and software options, see “Installing and Configuring Hardware and Software Options”.

Installing and Configuring Hardware and Software Options

This phase of installation collects information about the components of the system that will be installed, and then allows you to select hardware and software options.

Installing and Configuring System Hardware

The **System Configuration** windows display the hardware and country choices currently defined on the system. If the current choices are correct, click **Next**. Otherwise, click the icon beside the choice you want to change.

The first **System Configuration** window allows you to install and configure the following options:

- Locale
  - “Country” on page 34
  - “Keyboard” on page 35
- System
  - “Mouse” on page 35
  - “Serial Device Support” on page 35
  - “Primary Display” on page 35
  - “Secondary Display” on page 35
- Currently Installed Peripherals
  - “CD-ROM Device Support” on page 35

– “Multimedia Device Support” on page 35

– “Printer” on page 35

– “SCSI Adapter Support” on page 36

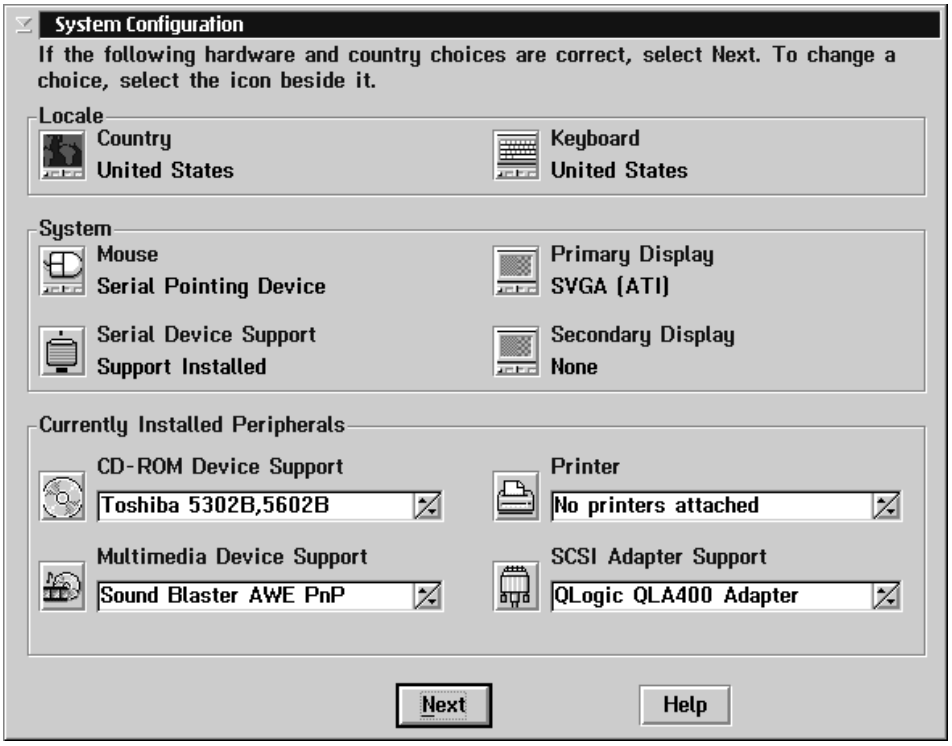

Figure 4. The first **System Configuration** *window.*

Country

Click **Country** to install support for a country other than the one listed. The country you select is used to set the locale information, including date and time format, decimal separator, currency symbol, and time zone. It is also used to determine which version of WIN-OS/2 to install, such as Latin, Greek, Hebrew, Arabic, Thai, Turkey, or Central European, for SBCS versions of OS/2 Warp Server for e-business.

The operating system uses the primary code page each time it starts, and it can switch to the alternate code page when necessary. A *code page* contains the language characters, letters, numbers, and symbols the computer uses to print or display information in a particular language.

If you select a country that uses the euro as its currency, you can click the **Use Euro Locale** option, which makes the euro sign the currency symbol to use when displaying monetary values.

See *OS/2 Keyboards and Codepages* in the **Assistance Center** folder after installation for more information about keytop character assignments and code pages.

Keyboard

Click **Keyboard** if you want to install a keyboard layout other than the one listed. When you select a keyboard, you indicate to the operating system the character to expect when you press a key. The keytop character arrangement varies from country to country.

See *OS/2 Keyboards and Codepages* for more information about keytop character assignments and code pages.

Mouse

Click **Mouse** to install a mouse or pointing device other than the one listed.

Serial Device Support

Click **Serial Device Support** to add support for a device, such as a modem, serial plotter, or serial printer, assigned to ports COM1, COM2, or COM3. This option is not required for mouse support.

Primary Display

Click **Primary Display** to install a primary display driver other than the one listed.

Secondary Display

Click **Secondary Display** to install a secondary display driver other than the one listed.

CD-ROM Device Support

Click **CD-ROM Device Support** to install support for a device other than the one listed.

Multimedia Device Support

Click **Multimedia Device Support** to install audio card drivers or to change the settings for audio cards.

Printer

Click **Printer** to install support for a printer or plotter. If you have a printer attached to your system, make sure that you select this option.

You can select a printer after installation by using the **Selective Install** option. See “Changing Hardware and Software Support after Installing OS/2 Warp Server for e-business” on page 69 for more information.

SCSI Adapter Support

Click **SCSI Adapter Support** to install support for an adapter other than the one listed. If you are installing to a laptop system, see “Installing to a Laptop System” on page 93 for device driver recommendations and considerations.

The second **System Configuration** window allows you to install configure the following options:

- “Advanced Power Management” on page 37
- “SCSI II Optical Support” on page 37
- “External Diskette Drive” on page 37
- “PCMCIA Support” on page 38
- “UltraBay Device Swapping” on page 38

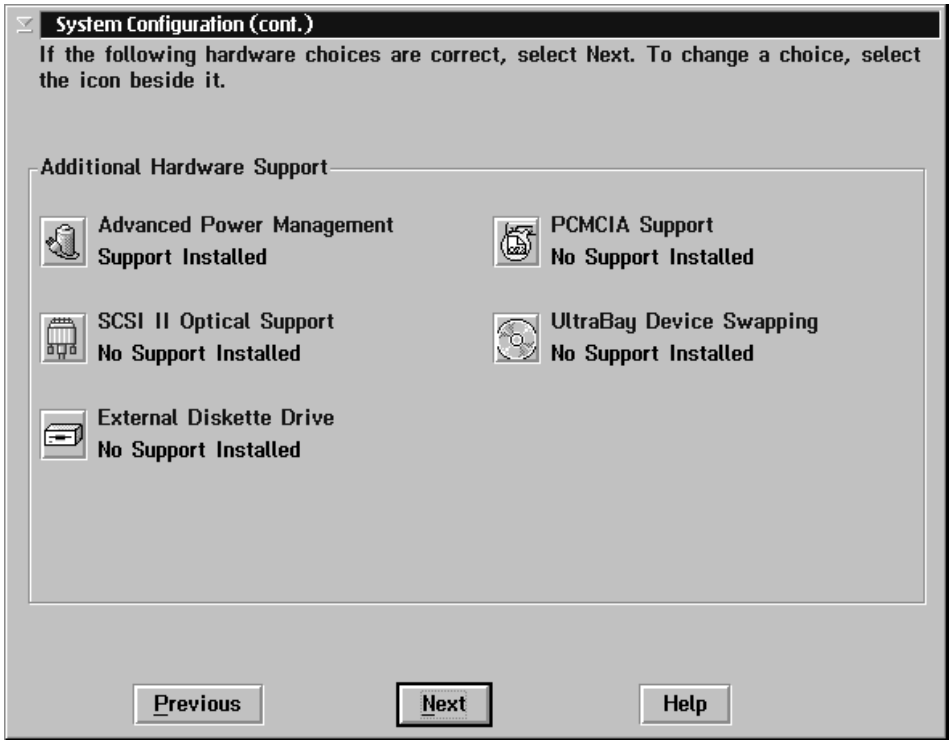

Figure 5. The second **System Configuration** *window.*

Advanced Power Management

Click **Advanced Power Management** if you have a server that has Advanced Power Management capabilities. During the initial installation of the operating system, this option is installed if the installation program detects this capability. Otherwise, it is not installed.

SCSI II Optical Support

Click **SCSI II Optical Support** to install support for SCSI II Optical drives with 512-byte sector optical media.

External Diskette Drive

Click **External Diskette Drive** to install support for an external diskette drive attached to your laptop computer.

PCMCIA Support

Click **PCMCIA Support** if you have a computer that has a *Personal Computer Memory Card International Association (PCMCIA)* adapter. During the initial installation of the operating system, this option is installed if the installation program detects such an adapter. Otherwise, it is not installed.

UltraBay Device Swapping

Click **UltraBay Device Swapping** to install support for interchangeability of your external diskette drive and CD-ROM UltraBay device on your IBM ThinkPad.

Selecting Features to Install

The **OS/2 Warp Server for e-business Setup and Installation** window displays which features of the operating system that can be installed. You can also format volumes for file systems, such as JFS. See “Formatting a Volume for JFS during Installation” on page 39 for instructions.

The check mark next to a feature means the feature is selected for installation. If you do not want to install a feature, remove the check mark. If a feature has a **More** button to its right, click **More** to see additional choices.

For example, if you want to install some of the font groups that come with the operating system, make sure **Fonts** is selected. Then click **More** to see a list of font groups. When the list is displayed, place check mark to the left of any font groups you want to install.

The following operating system features are available to install:

- “Assistance Center” on page 40
- “Fonts” on page 40
- “System Utilities” on page 41
- “System Components” on page 42
- “Printer Utilities” on page 43
- “Tools and Games” on page 43
- “OS/2 DOS Support” on page 44
- “WIN-OS/2 Support” on page 44
- “Multimedia Software Support” on page 45
- “Java Development” on page 45
- “Symmetric Multiprocessor (SMP) Support” on page 46

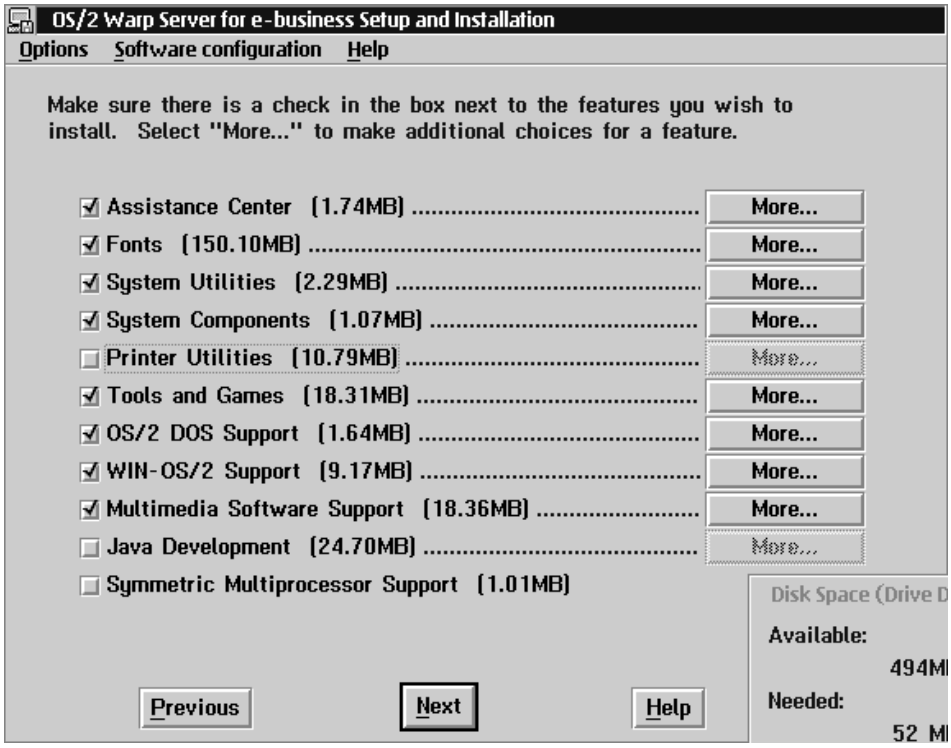

Figure 6. The **OS/2 Warp Server for e-business Setup and Installation** *window.*

Formatting a Volume for JFS during Installation

If you created an LVM volume earlier in the installation process, you can format it for JFS during installation. Doing this will allow you to install some components to the JFS volume. When the system displays the **OS/2 Warp Server for e-business Setup and Installation** window after rebooting during the installation process, you can format the volume.

To format an LVM volume for JFS:

1. From the **OS/2 Warp Server for e-business Setup and Installation** window, choose **Format** from the **Options** pull-down menu.
2. Select the volume you want to format. (This is the drive letter of the LVM volume you created earlier.)
3. Choose **Format Disk** from the **Selected** pull-down menu.

   The **Format Disk** window is displayed.
4. Type a volume name in the **Volume Label** entry field.
5. Select a file system type of JFS.
6. Click on the **Format** button.

   The **Format Progress** window is displayed.

7. Click **OK** when the formatting is complete.
8. Close the **Format Disk** window.

The **OS/2 Warp Server for e-business Setup and Installation** window displays the features of the operating system that can be installed. You can also format volumes from this window by clicking **Format** from the **Options** pull-down menu.

Assistance Center

Click **Assistance Center** to install online books and other technical information on the system. After installation, you can access the Assistance Center from the Desktop.

Fonts

OS/2 system fonts are automatically installed to the boot drive of OS/2 Warp Server for e-business. These system fonts are either OS/2 bitmap or Adobe Type Manager (ATM) fonts, and they contain the following character sets: Latin, Cyrillic, Hebrew, Greek, and Arabic. The OS/2 bitmap fonts also contain the Thai character set. The following OS/2 system fonts are automatically installed:

OS/2 Bitmap Fonts	ATM Fonts
Courier	Courier
Helv	Helvetica
System Monospace	
System Proportional	
System VIO	
Tms Rmn	Times New Roman
Warp Sans	

Click **Fonts** to indicate which *additional* font groups you want to install on the system. Select the volume where the additional font files will be installed. The fonts will be installed to the **\PSFONTS** directory of the volume you select. The following font groups are available:

- Unicode
- Japanese
- Simplified Chinese
- Traditional Chinese
- Korean
- Arabic legacy
- Greek legacy
- Thai

These additional fonts can be used on systems that function as print servers when you want to print documents that contain these additional character sets. The *Unicode* fonts are used to display all other characters that are outside the character sets of the

system fonts. If the Unicode fonts or other additional fonts are not installed, Java, Locale Settings, Netscape Navigator, and other applications that use these character sets will not display the characters.

System Utilities

The following system utilities are available:

- “Backup Hard Disk”
- “Change File Attributes”
- “Display Directory Tree”
- “Manage Partitions”
- “Label Diskettes”
- “Link Object Modules”
- “Picture Viewer”
- “PMREXX” on page 42
- “Recover Files” on page 42
- “Restore Backed-up Files” on page 42
- “Sort Filter” on page 42
- “Installation Utilities” on page 42
- “Create Utility Diskettes” on page 42
- “Serviceability and Diagnostic Aids” on page 42

Backup Hard Disk: This utility backs up one or more files from one disk to another.

Change File Attributes: This utility displays the current file state. It is also used to turn on or off the read-only attribute and the archive bit of selected files in a directory or for all files in a directory level.

Display Directory Tree: This utility displays all the directory paths found on a specified drive. It also lists the files in the root directory and in each subdirectory.

Manage Partitions: This utility creates or deletes a partition or logical drive or makes a partition startable.

Label Diskettes: This utility creates or changes the volume identification label on a disk.

Link Object Modules: This utility combines program modules together to create executable programs.

Picture Viewer: This utility prints or displays picture files.

PMREXX: This utility provides you with a windowed environment for running REXX programs and, by extension, any programs called by REXX. (REXX is a procedure language that can be used to write batch procedures. You can also use REXX as a macro language or as a traditional application programming language.)

Recover Files: This utility retrieves files from a disk that contains defective sectors.

Restore Backed-up Files: This utility copies one or more files that were previously backed up from one disk to another.

Sort Filter: This utility reads data from a standard input device (such as a keyboard), sorts the data, and writes it to a standard output device (such as a screen).

Installation Utilities: These utilities are required for response file (unattended or CID) installation and by some installation programs.

Create Utility Diskettes: Click **Create Utility Diskettes** to install a utility that creates bootable base OS/2 utility diskettes, which can access compatibility and logical volumes of all formats, such as JFS, 386 HPFS, HPFS, and FAT. These utility diskettes include the three bootable diskettes (such as the ones included with the OS/2 Warp Server for e-business product package) and a fourth diskette that contains some useful utilities for troubleshooting and tools to aid in system recovery.

This option also installs a utility to create bootable base OS/2 diskettes for CID. See the **README.CID** file for more information.

Serviceability and Diagnostic Aids: These utilities enable your system to gather information that can be used to isolate and correct system problems.

System Components

The following system components are available with this option:

- "Security"
- "High Performance File System (HPFS)"
- "Journaled File System" on page 43

Security: Click **Security** to install application programming interface (API) support for security applications. With this support, the security applications that you buy or develop can provide enhanced file, print, and process security.

High Performance File System (HPFS): If you have formatted a volume with HPFS during installation, this option is required and cannot be deselected. Click **High Performance File System** to install HPFS if you plan to use the HPFS file system later.

If you install HPFS, the installation program automatically sets up the HPFS cache and adds an IFS statement to the **CONFIG.SYS** file.

Journaled File System: If you have formatted a volume with JFS during installation, this option is required and cannot be deselected. Click **Journaled File System** to install JFS if you plan to use the JFS file system later.

If you install JFS, the installation program automatically adds an IFS statement to the **CONFIG.SYS** file.

Printer Utilities

Click **Printer Utilities** to install network printer utilities. The following printer utilities may be installed:

- MarkVision for OS/2
- MarkNet Port Driver

You can select the drive letter for the MarkVision for OS/2 and MarkNet Port Driver components.

Tools and Games

Click **Tools and Games** to install one or more of the tools and games on your system. The following tools and games are available:

- "Enhanced Editor"
- "Search and Scan Tool"
- "OpenGL 1.0 3D Graphics Library"
- "Optional Bitmaps"
- "Solitaire-Klondike"
- "CPU Monitor" on page 44
- "Chess" on page 44
- "Mahjongg Solitaire" on page 44

Enhanced Editor: This tool allows you to create and edit multiple files.

Search and Scan Tool: This tool allows you to search for files on your hard disk or to find text inside files.

OpenGL 1.0 3D Graphics Library: This option installs OpenGL, a precise, 3D rendering application programming interface (API). OpenGL provides 3D graphics support for technical and engineering applications, presentation graphics applications, desktop publishing applications, and end users.

Optional Bitmaps: Click **Optional Bitmaps** to have more selections available as background pictures for the OS/2 Warp Server for e-business Desktop.

Solitaire-Klondike: Click **Solitaire-Klondike** to install Klondike-style Solitaire.

CPU Monitor: Click **CPU Monitor** to install a tool that monitors the use of system resources using a graph.

Chess: Click **Chess** to install a chess game.

Mahjongg Solitaire: Click **Mahjongg Solitaire** to install a tile-matching game.

OS/2 DOS Support

Click **OS/2 DOS Support** to install one or more DOS session choices. Check the items you wish to install:

- "DOS Protect Mode Interface"
- "Virtual Expanded Memory Management"
- "Virtual Extended Memory Support"

DOS Protect Mode Interface (DPMI) and Virtual Extended Memory Support (VEMS) are DOS enhancements that are used by WIN-OS/2. If you choose to install WIN-OS/2 support, these two options cannot be deselected.

DOS Protect Mode Interface: Click **DOS Protect Mode Interface** if you want to run DOS programs written to the DOS Protected Mode Interface (DPMI) specification.

Virtual Expanded Memory Management: Click **Virtual Expanded Memory Management** if you want to run programs written to the Lotus/Intel/Microsoft Expanded Memory Specification (LIM EMS). This specification allows for up to 32MB of expanded memory.

Virtual Extended Memory Support: Click **Virtual Extended Memory Support** if you want to run programs written to the Lotus/Intel/Microsoft/AST Extended Memory Specification (LIMA XMS). This specification allows for the accessing of High Memory Area, Extended Memory Blocks, and Upper Memory Blocks.

WIN-OS/2 Support

Click **WIN-OS/2 Support** to install the WIN-OS/2 features you want. You can also indicate the volume (drive letter) where the WIN-OS/2 support should reside. WIN-OS/2 support can reside in the same volume as OS/2, or it can be placed in another volume.

You can install the following WIN-OS/2 features:

- **Destination drive.** Select the volume where files required for WIN-OS/2 support should be installed. The volume where you are installing WIN-OS/2 support must be formatted.
- **Readme files.** Select this option if you want to install more information about WIN-OS/2 support.
- **Accessories.** Select this option if you want to install the following WIN-OS/2 accessories:
  - Calculator

  - Calendar
  - Cardfile
  - Character Map
  - Clock
  - Media Player
  - Notepad
  - Object Packager
  - Paint Brush
  - Write

  Click **Help** for a description of each accessory.
- **Screen savers.** Select this option if you want to install screen savers.
- **Sound.** Select this option if you have a sound card installed and you want to be able to assign sounds to system events.

Click **Automatic Configuration** if you want the new WIN-OS/2 Desktop to look like your existing WIN-OS/2 or Windows Desktop (if one is already installed). If you do not already have a WIN-OS/2 or Windows Desktop installed on your system, this option installs the standard WIN-OS/2 Desktop for you.

Click **Advanced Configuration** if you want to change the appearance of your WIN-OS/2 Desktop. You can choose from the following options:

- Standard WIN-OS/2 Desktop (without any customized features)
- Copy your existing WIN-OS/2 Desktop
- Preserve your existing WIN-OS/2 Desktop

If you select WIN-OS/2 support, several TrueType fonts, such as Arial and Courier New, will be automatically installed.

Multimedia Software Support

Click **Multimedia Software Support** to set the following options:

- **Destination Drive.** Select the volume where files required for Multimedia Software Support should be installed.
- **Base Multimedia Support.** This option will install the OS/2 files that provide multimedia capabilities to your system.
- **Software Motion Video.** This option will install support for viewing high-resolution digital movies on your Desktop. You must have Base Multimedia Support installed in order to use Software Motion Video.

Java Development

Click **Java Development** to include the Java features. Place a check mark next to each Java feature you want to install.

Note: The default installation volume for Java support is the lowest drive letter formatted with either the HPFS or JFS file system. This drive letter may be different than the OS/2 boot volume, which is the default volume for installing most components.

Select the HPFS or JFS volume where files for Java support will be installed. Available Java features include:

- **Toolkit.** Select this option to install the following:
  - The javac compiler
  - C header files and libraries for building platform-specific methods
  - Debug versions of all executable files
- **Toolkit Documentation.** Select this option to install the Toolkit documentation on your system.
- **ICAT (Debugger) for OS/2 Java.** Select this option to install the debugger feature on your system.
- **Samples.** Select this option to install sample Java applets on your system.

OS/2 Java is the IBM OS/2 implementation of the Java technology from Sun Microsystem, Inc.

Symmetric Multiprocessor (SMP) Support

Click **Symmetric Multiprocessor (SMP) Support** to take advantage of the multiple processors on your SMP server.

When you select this option, you might be prompted to enter the source drive and directory of your manufacturer's platform-specific driver (PSD) file. Enter the full path for the PSD file, and then click **Install**. Click **Cancel** if you want to cancel installation of SMP support.

Installing and Configuring Server Components

After you have selected the hardware and software options, the **Installing OS/2 Warp Server for e-business** window is displayed. Click **Next** to continue installation of hardware and software support and to configure the server.

The **Information** window is displayed, prompting you to enter your name, department, and company. The information you enter here will be used during configuration to establish default names for your user ID, server, and domain.

Click **Next** to begin the server component installation, which includes the following tasks:

1. "Installing Hardware and Software Support" on page 47
2. "Configuring the Server before Installation" on page 50

During the installation process, you can choose whether or not to configure some items now or later. The **Configuration** window has an index of services that can be configured.

Installing Hardware and Software Support

You can install and configure some or all of the following services from the **OS/2 Warp Server for e-business Setup and Installation** window.

- **File and Print Sharing Services.** Allows you to use or share directories, printers, and serial devices across a LAN. Includes services such as Messenger, Netlogon, and Neighborhood Browser Enabler (NBE). NBE enables the server to function within its domain as a master browser for Windows clients. The master browser function provides Windows NT, Windows 98, and Windows 95 clients with the ability to view the domain's LAN Server machines and their resources via the Network Neighborhood object. This service is automatically installed when you select **File and Print Sharing Services**. There is not an option to deselect this service. For information about autostarting this service after installation, see "Autostarting Neighborhood Browser Enabler after Installation" on page 80.
- **TCP/IP Services.** Allows you to install functions so the server can distribute TCP/IP configuration for client workstations.
- **Remote Access Services.** Allows remote users to connect to the LAN.
- **Netscape Communicator.** Allows you to access the Internet
- **Tivoli Management Agent.** Allows a network administrator to manage hardware and software from a central location.
- **Personally Safe 'n' Sound (PSnS Backup and Recovery).** Allows you to back up files on your server.
- **Lightweight Directory Access Protocol (LDAP) Services Toolkit.** Allows the infrastructure to be built for clients, applications, and servers of multiple vendors to access information in a single, directory database in a consistent manner.
- **Advanced Print Services.** Converts print jobs into the type of data your printer supports.

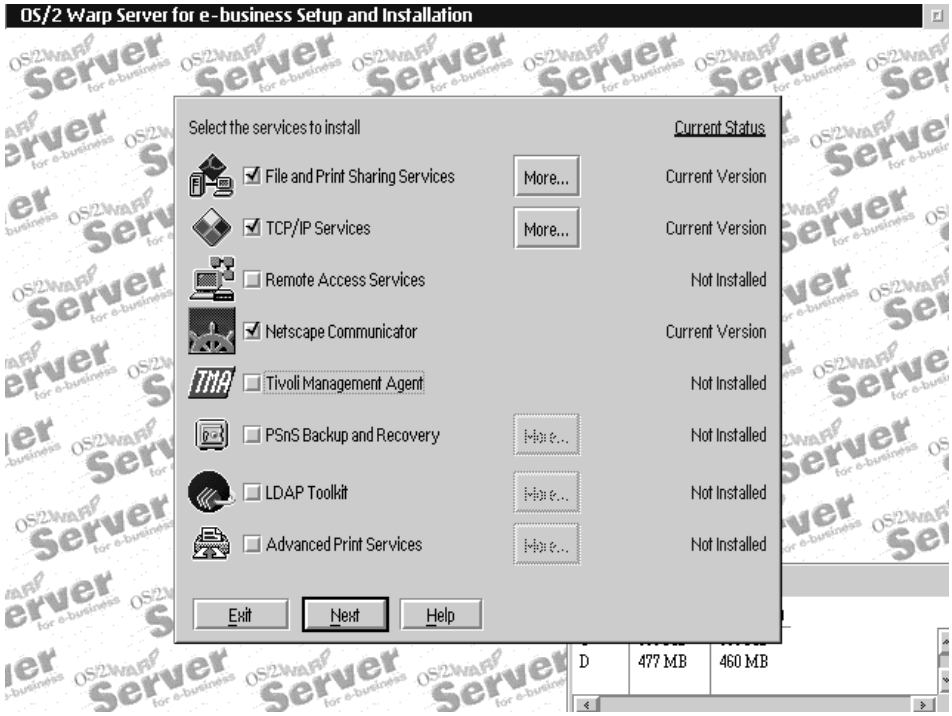

Figure 7. The OS/2 Warp Server for e-business services Setup and Installation window.

File and Print Sharing Services

This component includes a number of file and print sharing services as described below:

- **File and Print Sharing Services Installation/Configuration.** Allows you to use or share directories, printers, and serial devices across a LAN.
- **File and Print Sharing Administration.** Allows you to administer file and print sharing for client workstations.
- **User Profile Management.** Provides user ID validation and user and group management facilities.
- **Generic Alerter Service.** Generates alerts to report server problems over the network.
- **Virtual DOS LAN API Support.** Provides support for the LAN Server APIs in specific DOS sessions and in emulated DOS sessions when using the current version of the OS/2 program.
- **Network Messaging.** Allows you to exchange messages with other users and receive messages from resources, such as printers, finishing a print job.
- **Remote Boot Service for OS/2 Workstations (Remote IPL).** Allows you to support remote IPL of OS/2 workstations. If you select Remote IPL, you will need to run the **RIPLINST** utility to complete the setup of Remote IPL.

- **Remote Boot Service for DOS Workstations (Remote IPL).** Allows you to support remote IPL of DOS workstations. If you select Remote IPL, you will need to run the **RIPLINST** utility to complete the setup of Remote IPL.
- **Uninterruptable Power Supply (UPS) Support.** Provides protection against loss of data during power failures. Upon power interruption, users with active sessions to the affected server are notified of the impending shutdown, and then an orderly server shutdown is performed.
- **Migration Import Utility.** Provides the support to migrate a domain control database (DCDB) from PC LAN Program Version 1.3 to the current version of LAN Server.

TCP/IP Services

This option enables the server to distribute TCP/IP configuration to client workstations. For each service you install, you must configure it in the **TCP/IP Services** folder after installation is completed.

Select the TCP/IP services items that you want to install:

- **DHCP/DDNS Server Support.** Automatically assigns TCP/IP addresses and registers TCP/IP host names to the workstations attached to the LAN.
- **Virtual Private Network (VPN) Support.** Allows remote users to establish secure connections to their corporate intranets over the insecure Internet.
- **Network File System (NFS) Support.** Provides remote, transparent access to files and file systems.

Remote Access Services

Remote Access Services, or PPP Server, a replacement for LAN Distance, includes a remote access server that allows NetBIOS and point-to-point protocol (PPP) clients, including Windows NT, Windows 98, Windows 95, IBM OS/2 Internet Dialer, and IBM 8235 users, to remotely access the LAN.

Netscape Communicator

Netscape Communicator lets you access and navigate the Internet with Netscape Navigator, send and receive e-mail with Netscape Messenger, keep track of the latest postings in your favorite newsgroups with Netscape Collabra, and create your own Web pages with Netscape Composer. Some applications and services, such as those found at IBM Software Choice, use the browser as a graphical user interface (GUI) for tasks related to installing, uninstalling, or updating other software programs.

Tivoli Management Agent

The Tivoli Management Agent (TMA) extends the server/client hierarchy and enhances the scalability of a Tivoli Management Environment. Tivoli is a systems management tool for enterprise-wide, heterogeneous networks. The TMA increases the number of resources that can be managed and, at the same time, enables those resources to be used more efficiently.

PSnS Backup and Recovery

Personally Safe 'n' Sound (PSnS Backup and Recovery) allows you to safeguard your system against possible loss of information by taking backups of your OS/2 files and folders. The software allows for automatic or manual file backup, and you can selectively restore files. You designate how your backups are stored, and the software manages backup and retrieval for you. Diskette drive support is automatically included. The following devices are available for backup:

- Optical Drive Support
- LAN Drive Support
- SCSI Tape Drive Support
- ADSM Device Support
- Partitioned Removable Media Support
- Remote Drive Support

Lightweight Directory Access Protocol (LDAP) Toolkit

The LDAP Toolkit allows the infrastructure to be built for clients, applications, and servers of multiple vendors to access information in a single, directory database in a consistent manner.

The following components are part of the LDAP Toolkit:

- **LDAP Toolkit.** Select this item if you want to install the header files (**.h**) and libraries needed to develop an LDAP application.
- **LDAP Examples.** Select this item if you want to install the source for the sample LDAP programs, the header files, and the makefile.
- **LDAP Documentation.** Select this item if you want to install the LDAP Programming Reference (**.htm** files). After installing, load **progref.htm** with your Web browser to access the programming reference.
- **JAVA/JNDI Support.** Select this item if you want to install the JAVA/JNDI support.
- **JAVA Documentation.** Select this item if you want to install the JAVA/JNDI documentation.

Advanced Print Services

Advanced Print Services allows you to choose how printers are attached to your server, and increases your printing capability by automatically performing data stream transformations to convert the data in a document into the type of data required by the printer. This enables you to print formats that are typically not supported by the printer, such as converting PostScript files to print on non-PostScript printers.

Configuring the Server before Installation

Note: Do not click **Install** until you have finished configuring all the items that you want to install.

The **Configuration** window contains two sections:

- The section on the left side of the window contains a list of items that you can configure. A *green check mark* next to an item means that the item is correctly configured; a *red arrow* means that the item must be configured; and a *blue box* means that the item is configured correctly with the default value.
- The section on the right side of the window is the area in which you configure the currently selected item from the list on the left side of the window. In the list, click the item that you want to configure. Select and configure one item at a time.

  For information about configuration options for each item, click **Help**.

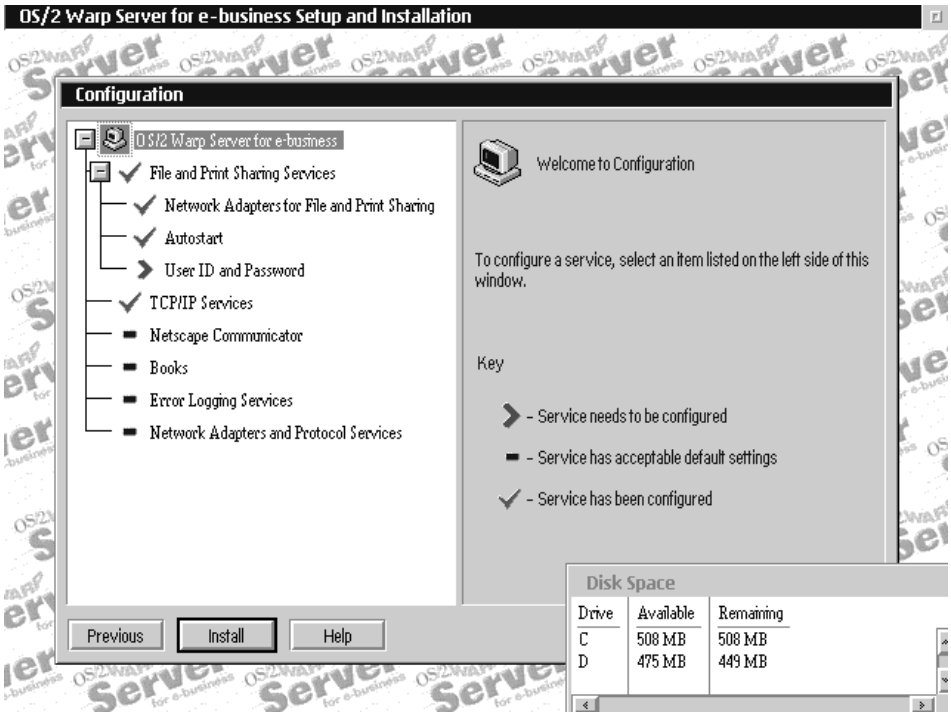

Figure 8. The **Configuration** *window lets you configure the services you want to install.*

To configure items:

1. Click the item to configure.

   The corresponding page for that item opens on the right side of the window.
2. Make your configuration choices for the item.
3. When you are finished configuring the first item, click another item from the list to open its corresponding configuration page.
4. Continue selecting and configuring items until you have configured all the items that you want to install.

5. When you have finished configuring all the items that you want, click **Install** to accept the configuration choices and continue installation.

Necessary files are copied from the *Server Pak CD* to the server. The system is restarted automatically, and installation and configuration continues. The system is restarted automatically for a final time.

Registering OS/2 Warp Server for e-business

After the system is restarted for the final time during installation, the **Software Registration** window is displayed. You can choose to register the product now or later. If you choose to register the product later, you can open the **System Registration** icon on the Desktop and complete the registration form as instructed.

Chapter 5. Creating and Managing Volumes and Hard Disk Partitions

The Logical Volume Manager (LVM) allows you to create and manage partitions and volumes on the hard disks in your system. LVM components are initially installed and configured during the OS/2 Warp Server for e-business installation process. After you install OS/2 Warp Server for e-business, you can use LVM to perform additional volume management tasks.

This section describes how to use the text mode window interface of the Logical Volume Management Tool (LVM.EXE).

To start LVM:

1. Open an OS/2 window.
2. Type `lvm` and press Enter.

LVM provides both logical and physical views of the system. The *logical view* displays the volumes currently configured on the system. The *physical view* shows how the hard disks are partitioned, including free space. Switch between the two views by pressing F5.

Note: Previous versions of OS/2, such as OS/2 Warp 4, cannot recognize volumes, but they do recognize partitions. Therefore, you might notice drive letter discrepancies between previous versions of OS/2 and OS/2 Warp Server for e-business. You can use LVM with OS/2 Warp 4; however, *you must use only the LVM physical view to manage partitions*.

The following LVM files are necessary if you plan to use LVM on OS/2 Warp 4:

```
lvm.exe (os2 directory)
lvm.dll (dll directory)
lvm.msg (system directory)
lvmh.msg (system directory)
```

Managing Volumes with the LVM Logical View

The LVM logical view displays the volumes currently configured on the system. You can use this view to create and manage volumes on your system and to specify Boot Manager support options. Boot Manager is a utility that allows you to have multiple operating systems on a system. The Boot Manager menu displays when you start the system, allowing you to choose which operating system to use.

The logical view is divided into two windows. Press Tab to move the highlight selector between the two windows.

The upper window displays the volumes currently in use. This window is used to create, delete, hide, name, and expand volumes, plus specify Boot Manager support options.

The lower window displays partition information for the volume you have highlighted in the upper window. Operations on a highlighted partition can be performed without switching to the physical view.

The LVM logical view displays the volumes currently configured on the system,

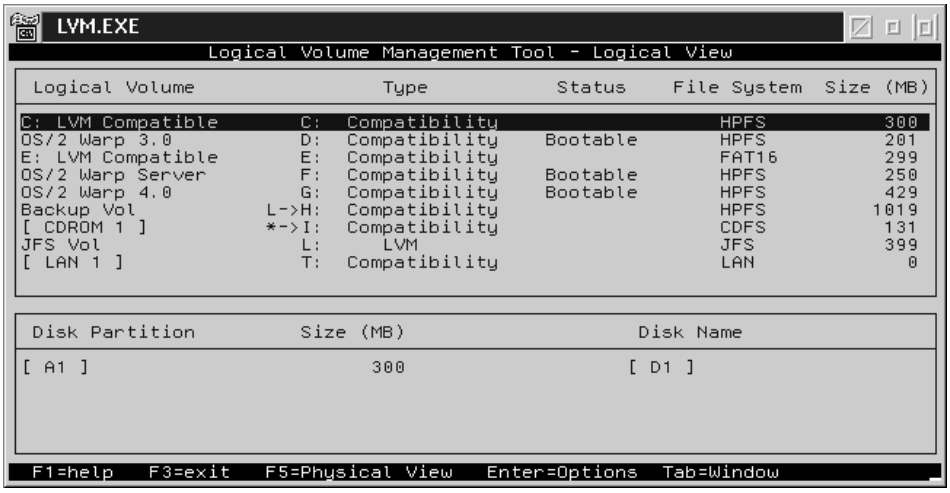

Figure 9. The LVM logical view displays the volumes currently configured on the system.

including volumes on hard disks, network drives, CD-ROM drives, and partitioned removable media.

Other information in the upper logical view window includes:

Logical Volume
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 when you create a volume with the **Create a new volume** option, or you can change the name with the **Change the volume name** option.

Drive Letter Preferences
The new drive letter assignments until you exit LVM and save the changes. Drive letter preferences are displayed to the left of the assigned drive letters. An asterisk (*) indicates that no drive letter preference has been assigned.

Current Drive Letter Assignments
The drive letter assignments to which the volumes are currently assigned. Assigned drive letters are displayed to the left of the **Type** column.

Temporary Volumes for Non-LVM Devices
LVM displays temporary volumes to represent non-LVM devices, such as CD-ROM drives and network drives, which have drive letters assigned to them.

Drive Letter Conflicts

LVM displays drive letter conflicts or discrepancies in the logical view as follows:

`X:->Y:`, where *X* is the drive letter preference of the volume, and *Y* is the drive letter to which the volume is currently assigned. This notation is displayed only if the two drive letters, X and Y, are different.

Type Two types of volumes are possible with LVM: Compatibility volumes and LVM volumes.

- *Compatibility* volumes created by LVM can be marked bootable or startable, are accessible by other operating systems, and can be formatted for 386 HPFS, HPFS, or FAT. The OS/2 base operating system must be installed on a compatibility volume.
- *LVM* volumes can be formatted for JFS, 386 HPFS, HPFS, or FAT, and can link multiple partitions into a single volume. LVM volumes can be accessed only by OS/2 versions that contain LVM.

Status A volume designation indicating if a volume is startable, bootable, or installable. See “Volume Designations” on page 18 for more information.

- If set *Startable*, the respective volume is used to start the system. If any volume other than the Boot Manager partition is set startable, no volume is displayed as bootable, and Boot Manager does not run. Boot Manager is typically set as the startable partition, but it does not display in the logical view.
- If set *Bootable*, the respective volume is displayed on the Boot Manager menu when the system is started. LVM volumes cannot be bootable.
- If set *Installable*, the respective volume is designated as the target for installing OS/2 Warp Server for e-business. The *installable* designation is displayed and set only during installation, and it implies that the installable volume is also bootable or startable, depending on whether or not Boot Manager is installed. If Boot Manager is installed, the volume that is set installable is also bootable. If Boot Manager is not installed, the volume that is set installable is also startable.

File System

Indicates the type of file system used on the volume. Any volumes that have not been formatted have a file system type indicated as *None*.

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

To modify a volume setup, highlight the volume, and then press Enter to display the **Options** menu. You can perform the following tasks in the logical volume view:

- “Expanding a Volume” on page 56
- “Deleting a Volume” on page 57
- “Hiding a Volume from OS/2” on page 57
- “Changing a Volume Name” on page 57
- “Changing a Drive Letter Assigned to a Volume” on page 58

- “Setting a Volume Installable” on page 59
- “Setting a Volume Startable” on page 59
- “Adding a Volume to the Boot Manager Menu” on page 59
- “Removing a Volume from the Boot Manager Menu” on page 60
- “Creating a New Volume” on page 60
- “Installing Boot Manager” on page 63
- “Removing Boot Manager” on page 63
- “Setting or Changing Boot Manager Startup Values” on page 64

Expanding a Volume

Use **Expand the volume** to expand an LVM volume. You may expand a volume if the volume does not have a file system associated with it (if it is unformatted) or if the volume has the JFS file system associated with it. If file systems other than JFS are associated with the volume you want to expand, you must first delete the volume, and then re-create it.

To expand a volume:

1. Select an LVM volume to be expanded by using the arrow keys to highlight it.
2. Press Enter to display the **Options** menu.
3. Highlight **Expand the volume** and press Enter.
4. Read the instructions for choosing a disk and press Enter to continue.
5. Highlight a disk and press Enter.

   A window is displayed, allowing you to specify information about the volume you want to expand.
6. Highlight your choice of **Use existing partition** or **Allocate from free space** and press Enter.
7. Highlight a partition or free space block from the list and press Enter.
8. Type a name for the partition and press Enter.
9. If a window is displayed instructing you to specify a partition size, type a partition size value and press Enter.
10. If you want to add more partitions to the LVM volume, go back to step 5 for additional disk selection.
11. If you are finished adding partitions to the LVM volume, press F6 to end the partition selection and to activate your choices.
12. Press F3 to exit LVM.
13. Highlight **Save the changes and exit** and press Enter.

When the changes are saved, the system attempts to expand the volume without restarting; however, if other LVM operations are performed during the same LVM session, the system might need to be restarted to make the changes effective. You are prompted when a restart is required.

Deleting a Volume

Use **Delete the volume** to delete an existing volume. All partition structures associated with the volume will be removed from the associated hard disks.

To delete a volume:

1. Select the volume you want to delete by using the arrow keys to highlight it.
2. Press Enter to display the **Options** menu.
3. Highlight **Delete the volume** and press Enter.
4. Confirm that this is the correct volume to delete and press Enter.
5. Highlight **Delete the volume** and press Enter.
6. Press F3 to exit LVM.
7. Highlight **Save the changes and exit** and press Enter.

When the changes are saved, the system attempts to delete the volume without restarting; however, if the file system cannot be unmounted, the system needs to be restarted to make the changes effective. You are prompted when a restart is required.

Hiding a Volume from OS/2

Use **Hide the volume from OS/2** to remove a drive letter and make a volume invisible to OS/2. Use this choice to block access to a volume by the file system. For example, if you have a Windows volume, you might not want to access it from OS/2. Therefore, you would need to hide the volume. A volume that is hidden is no longer accessible by OS/2, but all the associated data still exists on the hard disk.

To hide a volume from OS/2:

1. Select the volume you want to hide by using the arrow keys to highlight it.
2. Press Enter to display the **Options** menu.
3. Highlight **Hide the volume from OS/2** and press Enter.
   The drive letter is no longer displayed.
4. Press F3 to exit LVM.
5. Highlight **Save the changes and exit** and press Enter.

Note: Use **Change the volume drive letter** to make the volume visible to OS/2 again.

When the changes are saved, the system attempts to hide the volume without restarting; however, if the file system cannot be unmounted, the system needs to be restarted to make the changes effective. You are prompted when a restart is required.

Changing a Volume Name

Use **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 the volume you want to change by using the arrow keys to highlight it.
2. Press Enter to display the **Options** menu.
3. Highlight **Change the volume name** and press Enter.
4. Type the volume name in the space provided and press Enter. The new volume name is now displayed.
5. Press F3 to exit LVM.
6. Highlight **Save the changes and exit** and press Enter.

Changing a Drive Letter Assigned to a Volume

Use **Change the volume drive letter** to change the drive letter associated with an existing volume, or to make the volume visible to OS/2 after you have hidden it using **Hide the volume from OS/2**. The new drive letter association remains unchanged until you change the drive letter again or delete the volume.

Note: Changing the drive letter assigned to a volume can have unforeseen effects. The drive letter currently assigned to the volume must not appear in any **PATH**, **DPATH**, or **LIBPATH** statements in your **CONFIG.SYS** file. Furthermore, the drive letter should not be referenced in any of the **.INI** files on the system. If these conditions are not met, your system might not start properly, and some programs might not run correctly.

To change the drive letter assigned to a volume:

1. Select the volume you want to change by using the arrow keys to highlight it.
2. Press Enter to display the **Options** menu.
3. Highlight **Change the volume drive letter** and press Enter.
4. Read the warning message that is displayed, and then press Enter to continue.
5. Highlight the new drive letter and press Enter.

   The new drive letter is displayed.
6. Press F3 to exit LVM.
7. Highlight **Save the changes and exit** and press Enter.

When the changes are saved, the system attempts to change the drive letter assignment without restarting; however, if the file system cannot be unmounted, or if the drive letter conflicts with one that is already in use by a non-LVM device, the system needs to be restarted to make the changes effective. You are prompted when a restart is required.

When you assign a new drive letter to a volume, LVM indicates which drive letters belong to non-LVM devices in the drive letter selection window:

>X<, where *X* is the drive letter.

This notation indicates that you can select this drive letter for the volume you are reassigning, but you will also need to restart the system after you exit LVM.

Setting a Volume Installable

A volume can be set installable only during installation of OS/2 Warp Server for e-business.

See “Setting the Installation Volume with Logical Volume Manager” on page 29.

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 it is installed, is automatically set as the startable partition. Only one partition can be set as startable; therefore, if Boot Manager is to be active, no volumes can be set as startable. If you set a volume as startable with LVM, Boot Manager is disabled. Note that Boot Manager cannot be seen from the LVM logical view because no drive letter is assigned to it, but it can be seen in the LVM physical view.

To set a volume startable:

1. Select the volume that you want to set startable by using the arrow keys to highlight it.
2. Press Enter to display the **Options** menu.
3. Highlight **Set the volume startable** and press Enter.

   When a volume is set startable, the word *startable* is displayed in the **Status** column.
4. Press F3 to exit LVM.
5. Highlight **Save the changes and exit** and press Enter.

Adding a Volume to the Boot Manager Menu

Use **Add the 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 wish to access when your system starts. For example, if you have a previous version of OS/2 Warp Server on one volume and OS/2 Warp Server for e-business on another volume, you might want both volumes to display on the Boot Manager Startup menu. Doing this allows you to start the system with either version of OS/2 Warp Server.

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 the volume to be added by using the arrow keys to highlight it.

2. Press Enter to display the **Options** menu.
3. Highlight **Add the volume to Boot Manager menu** and press Enter.

The status of the volume is now *Bootable*.

Removing a Volume from the Boot Manager Menu

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

To remove a volume from the Boot Manager Startup menu:

1. Select the volume to be removed by using the arrow keys to highlight it.
2. Press Enter to display the **Options** menu.
3. Highlight **Remove the volume from Boot Manager** and press Enter.

The word *Bootable* is no longer displayed in the **Status** column.

Creating a New Volume

Use **Create a new volume** to create a volume on one or more selected hard disks. You can create bootable or nonbootable volumes. If you are creating an installation volume for OS/2 Warp Server for e-business, you must create a bootable volume.

If you want to keep your existing C: drive available with its own operating system, and then set up D: as the target compatibility volume for installing OS/2 Warp Server for e-business, you must first install Boot Manager. Only one volume is bootable unless Boot Manager is installed. See “Installing Boot Manager” on page 63 for instructions.

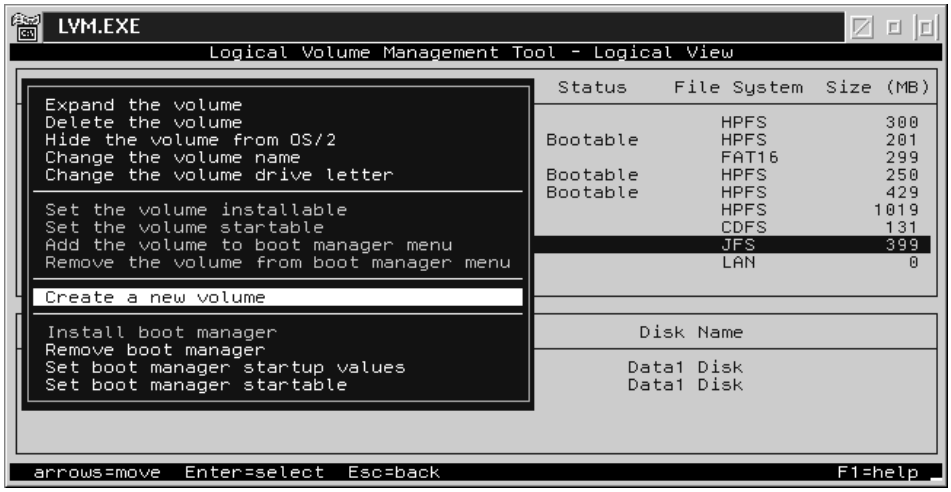

Figure 10. Use the LVM logical view to create a volume.

Creating a Bootable Volume

Use **Create a volume that can be made bootable** to create a bootable volume. A bootable volume is a volume that can be used to boot an operating system from Boot Manager. When you create a bootable volume, it is automatically added to the Boot Manager Startup menu. A volume created as bootable is a compatibility volume. Create a nonbootable volume when you want an LVM volume or when you want to use the Journaled File System (JFS).

To create a volume that can be made bootable:

1. Press Enter to display the **Options** menu.
2. Highlight **Create a new volume** and press Enter.
3. Highlight **Create a volume that can be made bootable** and press Enter.
4. Highlight a drive letter in the list and press Enter.
5. Type the new volume name in the space provided and press Enter twice.
6. Highlight a hard disk on which to create the volume and press Enter.
7. Highlight **Allocate from free space** and press Enter.
8. Highlight the free space block you want and press Enter.
9. Enter a name for the partition that is included in the new volume and press Enter.
10. Enter a size, in megabytes, for the partition and press Enter.

    The new volume is displayed in the LVM logical view.
11. Press F3 to exit LVM.
12. Highlight **Save the changes and exit** and press Enter.

Changes are effective when you save the changes and exit LVM. The system attempts to add the new volume without restarting; however, under some circumstances, the system needs to be restarted to make the changes effective. You are prompted when a restart is required.

When you create a volume, LVM indicates which drive letters belong to non-LVM devices in the following format:

>X<, where *X* is the drive letter.

This notation indicates that you can select this drive letter for the volume you are creating, but you will also need to restart the system after you exit LVM.

Creating a Nonbootable Volume

Use **Create a volume that does not need to be bootable** to create a nonbootable volume. A nonbootable volume is a volume that is not used to boot an operating system. Create a nonbootable volume when you want to create an LVM volume or to use the Journaled File System (JFS). Nonbootable volumes usually contain data (not operating systems); however, you can install certain components of OS/2 Warp Server for e-business to a nonbootable volume.

Note: Nonbootable volumes can be either compatibility volumes or LVM volumes. LVM volumes cannot be set as installable, bootable, or startable.

To create a volume that is not bootable:

1. Press Enter to display the **Options** menu.
2. Highlight **Create a new volume** and press Enter.
3. Highlight **Create a volume that does not need to be bootable** and press Enter.
4. Highlight **Create a compatibility volume** and press Enter if you want the volume to be accessed by other operating systems or previous versions of OS/2, or highlight **Create an LVM volume** and press Enter if you want the volume to span multiple partitions or if you want to format the volume for JFS.
5. Highlight a drive letter in the list and press Enter.
6. Type the new volume name in the space provided and press Enter.
7. Read the instructions for selecting a disk and using F6, and then press Enter to continue.
8. Highlight the hard disk on which to create the volume and press Enter.
9. Highlight **Allocate from free space** and press Enter.
10. Highlight which free space block to use and press Enter.
11. Enter a name for the partition that is included in the new volume and press Enter.
12. Enter a size, in megabytes, for the partition and press Enter.
13. If you are creating an LVM volume, either go back to step 8 to add another partition to the volume, or press F6 to indicate that partition selection is complete.
14. Press F3 to exit LVM.

15. Highlight **Save the changes and exit** and press Enter.

Changes are effective when you save the changes and exit LVM. The system attempts to add the new volume without restarting; however, under some circumstances, the system needs to be restarted to make the changes effective. You are prompted when a restart is required.

When you create a volume, LVM indicates which drive letters belong to non-LVM devices in the following format:

>X<, where *X* is the drive letter.

This notation indicates that you can select this drive letter for the volume you are creating, but you will also need to restart the system after you exit LVM.

Installing Boot Manager

Use **Install Boot Manager** to install Boot Manager on the system. 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. Only one partition can be set as startable; therefore, if Boot Manager is installed, no volumes have a status of startable. Note that Boot Manager cannot be seen from the LVM logical view because no drive letter is assigned to it, but it can be seen in the LVM physical view.

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 Manager:

1. Press Enter to display the **Options** menu.
2. Highlight **Install Boot Manager** and press Enter.

Boot Manager is now installed.

Removing Boot Manager

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

To remove Boot Manager:

1. Press Enter to display the **Options** menu.
2. Highlight **Remove Boot Manager** and press Enter.

Boot Manager is now removed from the system. You must now set a volume as startable for the system to boot from the hard disk. See “Setting a Volume Startable” on page 59.

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, and change the display mode.

For Boot Manager support, the Boot Manager partition must be set as startable. To deactivate Boot Manager support without deleting its partition or any of the environment information, set a volume as startable using the procedure described in “Setting a Volume Startable” on page 59.

To set or change Boot Manager startup values:

1. If you want to change the default boot selection, select the volume by using the arrow keys to highlight it.
2. Press Enter to display the **Options** menu.
3. Highlight **Set Boot Manager startup values** and press Enter.

   A window is displayed, allowing you to specify Boot Manager options.

   - **Default boot selection** allows you to choose the default boot volume that boots automatically each time you start the system, unless you select another volume from the Boot Manager menu during the timeout period.

     The currently configured default boot volume is displayed when the **Boot Manager Options** window is opened. Press Enter to change the default boot volume to the volume you selected before opening **Set Boot Manager startup values**.
   - For **Timer active**, you can select **Yes** or **No**. Toggle between **Yes** and **No** by pressing Enter. Select **Yes** when you want the default volume to boot automatically after the timeout period. Select **No** to specify that the Startup menu is to remain displayed until a selection is made.
   - For **Time-out value**, highlight the **Time-out value** choice on the **Startup Values** menu, and then press Enter to display the **Startup Timeout** window. Enter the number of seconds you want the Boot Manager menu to be displayed before the default volume is booted automatically. Press Enter to activate your entry and display it as the timeout value in the **Startup Values** menu.

     Note: This value is active only when **Timer active** is **Yes**.
   - For **Display mode**, you can choose either **Advanced** or **Normal** to indicate the amount of information to be displayed on the Boot Manager menu. Normal Mode displays only the names of the volumes on the Startup menu. Advanced mode gives more information about the volumes on the Startup menu. This information includes disk number, drive letter, type of partition, volume size, file system type, and accessibility, if hidden.
4. Make your selections for the startup options and select **Save the changes**.
5. Press Enter to save the changes, or press Esc to cancel.

Managing Partitions with the LVM Physical View

The LVM physical view displays the partitions present on each hard disk, allowing you to create and manage individual partitions. You can create partitions for other operating systems that do not recognize LVM volumes or linked volumes. You can also create a partition of a specific size and allocate it from the beginning or end or free space.

Note: After volumes have been created with LVM, FDISK should no longer be used to manage partitions.

Note: Partitions do not have drive letters associated with them. You must create a volume to assign a drive letter. See “Creating a New Volume” on page 60 for instructions on creating a volume.

This view has two windows to show how the disks are partitioned. Press Tab to move the highlight selector between the two windows.

The upper window displays the physical disks in the system, allowing you to change the name of a disk.

The lower window displays partition information for a disk you have selected, allowing you to create a new partition, delete a partition, rename a partition, and change the name of the volume containing a partition.

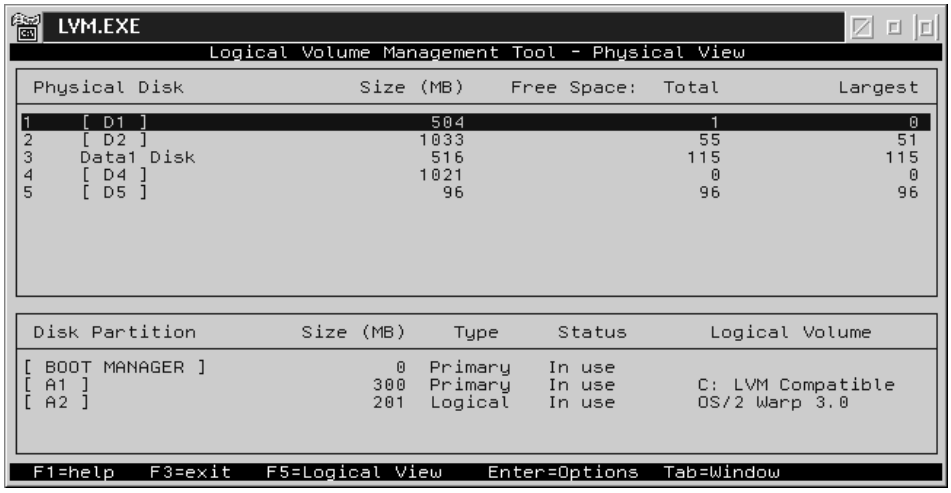

Figure 11. The LVM physical view displays the current partitions and allows to you manage them.

Other information in the *upper* window of the physical view includes:

Physical disk
The disk number and name that have been assigned to the hard disk.

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

Total free space
Indicates the amount of space on a physical disk that is currently not allocated to a partition.

Largest free space
Indicates the largest contiguous piece of free space that can be used to create a partition.

To modify a disk setup, highlight the disk, and then press Enter to display the **Options** menu. You can perform the following tasks in the upper window of the physical view:

- "Changing the Disk Name"

Other information in the *lower* window of the physical view includes:

Disk partition
Indicates the name of each existing partition or free space.

Size Indicates the size, in megabytes (MB), of the partition or free space.

Type Indicates the partition type, either *Primary* or *Logical*.

Status Indicates the availability status of the partition, either *In use* or *Available*.

Logical volume
Indicates the name of the volume, if any, which includes the partition.

To modify a partition setup, highlight the partition or free space, and then press Enter to display the **Options** menu. You can perform the following tasks from the lower window of the physical view:

- "Creating a New Partition" on page 67
- "Deleting an Existing Partition" on page 67
- "Changing the Partition Name" on page 67
- "Changing the Volume Name" on page 68

Note: If you highlight the **BOOT MANAGER** partition, the **Options** menu is not displayed, and none of the above functions can be performed. All functions for Boot Manager are performed in the LVM logical view.

Changing the Disk Name

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

To change the disk name:

1. Select the disk whose name you want to change by using the arrow keys to highlight it.

2. Press Enter to display the **Options** menu.
3. Highlight **Change the disk name** and press Enter.
4. Type a new name for the disk in the space provided and press Enter.

The new name is now displayed.

Creating a New Partition

Use **Create a new partition** to create a new partition using all or part of a free space block.

To create a new partition:

1. Select the free space block you want to use by using the arrow keys to highlight it.
2. Press Enter to display the **Options** menu.
3. Highlight **Create a new partition** and press Enter.
4. Highlight **Logical Partition** or **Primary Partition** and press Enter.
5. Highlight **Create at the end of free space** or **Create at the beginning of free space** and press Enter.
6. Type a name for the partition and press Enter.
7. Type a size for the partition and press Enter.

Deleting an Existing Partition

Use **Delete the partition** to delete an existing partition. This procedure is allowed only if the partition status is *Available*. If the status is *In use*, then the entire volume must be deleted from the LVM logical view.

To delete a partition:

1. Select the existing partition to delete by using the arrow keys to highlight it.
2. Press Enter to display the **Options** menu.
3. Highlight **Delete the partition** and press Enter.
4. Confirm that this is the correct partition to delete and press Enter.
5. Highlight **Delete the partition** and press Enter.

Changing the Partition Name

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

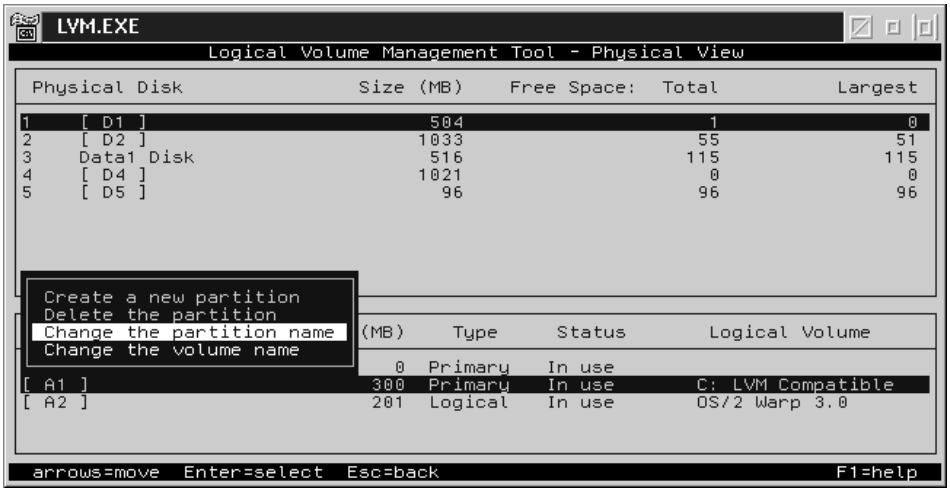

Figure 12. Use the LVM physical view to rename a partition.

To rename an existing partition:

1. Select the existing partition to rename by using the arrow keys to highlight it.
2. Press Enter to display the **Options** menu.
3. Highlight **Change the partition name** and press Enter.
4. Type a new name for the partition in the space provided and press Enter.

Changing the Volume Name

Use **Change the volume name** to rename the volume associated with an existing partition.

To change the volume name:

1. Select the existing partition associated with the volume by using the arrow keys to highlight it.
2. Press Enter to display the **Options** menu.
3. Highlight **Change the volume name** and press Enter.
4. Type a new name for the volume in the space provided and press Enter.

Chapter 6. Additional Installation and Configuration Options

After you install OS/2 Warp Server for e-business, you might need to perform additional installation and configuration tasks, depending on your system. Review this section to determine which additional tasks you might need to perform. The following tasks are discussed in this section:

- "Changing Hardware and Software Support after Installing OS/2 Warp Server for e-business"
- "Changing Support for Server Components after Installing OS/2 Warp Server for e-business" on page 70
- "Creating a Volume for Receiving Memory Dumps" on page 70
- "Formatting a Volume for a File System after Installation" on page 72
- "Resetting Windows and Boot Manager Options" on page 72
- "Creating Installation Diskettes" on page 73
- "Modifying the Installation Diskettes for New Hardware" on page 74
- "Installing MPTS with Strong Encryption" on page 78
- "Installing Lotus Domino Go Webserver" on page 79
- "Installing IBM WebSphere Application Server" on page 79
- "Autostarting Neighborhood Browser Enabler after Installation" on page 80
- "Configuring a PPP Server Ethernet Bridge after Installing OS/2 Warp Server for e-business" on page 81

Changing Hardware and Software Support after Installing OS/2 Warp Server for e-business

You can add support for a device or change existing support after installing OS/2 Warp Server for e-business:

1. From the OS/2 Warp Server for e-business Desktop, open **OS/2 System**.
2. Open **System Setup**.
3. Open **Install/Remove**.
4. Open **Selective Install**.

Changing Support for Server Components after Installing OS/2 Warp Server for e-business

You can add support for a device or change existing support after installing OS/2 Warp Server for e-business:

1. From the OS/2 Warp Server for e-business Desktop, open **OS/2 System**.
2. Insert the *Server Pak CD* into the CD-ROM drive.
3. Open **System Setup**.
4. Open **Install/Remove**.
5. Open **Selective Install for Networking**.

Creating a Volume for Receiving Memory Dumps

If your system traps or hangs, you might be required to provide a memory dump of the system to help IBM technical support personnel analyze the problem. To obtain a memory dump, you must first set up a dump volume with LVM. You should create the dump volume immediately after installing OS/2 Warp Server for e-business, so it is available if you need it.

Dump Volume Requirements

The dump volume must be:

- A compatibility volume.
- Formatted with the FAT file system.
- Larger than the amount of installed RAM on the system by at least 1MB.
- Labeled **SADUMP** (this label refers to the *file system volume label*, and not to the volume or partition names you assign in LVM).
- Created on the physical drive that is attached to a bootable hard disk controller. If the dump volume exists on a drive that is not attached to the bootable hard disk controller (for example, if it is attached to a secondary SCSI controller), then the system cannot find the volume when the memory dump is taken.

Note: Some systems do not support booting from disks with more than 1024 cylinders. If you have such a system, then the dump volume must reside within the first 1024 cylinders. If you are not sure about your system, and if you have installed Boot Manager, you can use LVM to create a bootable volume when you create a dump volume. If LVM allows the dump volume to be created as *bootable*, then the volume is safe for receiving memory dumps. After you have successfully created the volume as bootable, you can remove it from the Boot Manager menu, so it is not displayed when the system is started.

Setting Up a Dump Volume

There are three main parts to setting up a dump volume:

1. “Creating the Dump Volume” on page 71

2. “Formatting the Dump Volume”
3. “Setting Up the TRAPDUMP Command”

Creating the Dump Volume

To create a dump volume:

1. Open an OS/2 window.
2. Type `lvm` and press Enter.

   The LVM logical view is displayed.
3. If Boot Manager is not already installed, install it now. See “Installing Boot Manager” on page 63 for instructions.
4. Create a bootable volume. See “Creating a Bootable Volume” on page 61 for instructions. Be sure to create the volume at least 1MB larger than the amount of installed RAM in your system. Be sure to create the volume on a physical drive that is attached to a bootable hard disk controller.
5. Remove the new volume from the Boot Manager menu. See “Removing a Volume from the Boot Manager Menu” on page 60 for instructions.

Formatting the Dump Volume

After the dump volume is created, it must be formatted with the FAT file system. To format the dump volume, see “Formatting a Volume for a File System after Installation” on page 72 for instructions. Be sure to set the volume label as **SADUMP**.

Setting Up the TRAPDUMP Command

After the dump volume is formatted, you can use the **TRAPDUMP** statement in the **CONFIG.SYS** file to specify under which conditions a memory dump is taken. For more information about the **TRAPDUMP** command, see *Command Reference* or type `help trapdump` at an OS/2 command line.

If **TRAPDUMP** is active, then the system is automatically rebooted after the memory dump is taken. If you set **TRAPDUMP=OFF**, but if you still want your system to automatically restart in the event of a ring 0 trap or an internal processing error, add **REIPL=ON** to the **CONFIG.SYS** file. For more information about the **REIPL** command, see *Command Reference* or type `help reipl` at an OS/2 command line.

Consider using the *R0* parameter to force automatic dumping only in the event of a ring 0 trap. Otherwise, if *ON* is specified instead of *R0*, a ring 3 trap in a noncritical application will halt the system when the memory dump is taken.

Note: All data that is stored on the dump volume is lost when the memory dump is taken.

Formatting a Volume for a File System after Installation

After you create a volume using LVM, whether you create it during or after installation, you must format it with a file system: Journaled File System (JFS), High Performance File System (HPFS), or File Allocation Table file system (FAT). For information about these file systems, see “File System Descriptions” on page 20.

To format a volume for a file system:

1. From the Desktop, open the **OS/2 System** folder.
2. Open the **Drives** folder.
3. Select the volume you want to format.
4. Choose **Format Disk** from the **Selected** pull-down menu.
   The **Format Disk** window is displayed.
5. Type a volume name in the **Volume Label** entry field.
6. Select a file system type: JFS, HPFS, or FAT.
7. Click on the **Format** button.
   The **Format Progress** window is displayed.
8. Click **OK** when the formatting is complete.
9. Close the **Format Disk** window.

Resetting Windows and Boot Manager Options

If you install a Microsoft Windows operating system (Windows NT, Windows 98, Windows 95, or Windows 3.1) after installing OS/2 Warp Server for e-business and Boot Manager, the system boots directly to the Windows operating system. In other words, the Boot Manager Startup menu is no longer displayed when you start the system.

To make the Windows operating system and Boot Manager work together, reset Boot Manager as startable, and then add the Windows partition to the Boot Manager menu.

Setting Boot Manager as Startable following Windows NT/98/95 Installation

To reset Boot Manager as startable:

1. Insert the *OS/2 Warp Server for e-business Installation Diskette* into the diskette drive.
2. Restart the system.
3. Follow the prompts on the screen until the last diskette is processed.
4. When the Welcome! screen is displayed, press F3 to display the command prompt.
5. Change the drive letter from A: to the drive letter where OS/2 Warp Server for e-business is installed.
6. Type `lvm` and press Enter.

7. Press Enter to display the **Options** menu.
8. Highlight **Set Boot Manager startable** and press Enter.
9. Press F3 to exit LVM.
10. Highlight **Save the changes and exit** and press Enter.
11. Remove the *Installation Diskette* from the diskette drive.
12. Restart the system.

The system now restarts to Boot Manager.

Adding a Windows Partition to Boot Manager

To add a Windows partition to Boot Manager:

1. Open an OS/2 window from the Desktop.
2. Type `lvm` and press Enter.
3. Press Enter to display the **Options** menu.
4. Highlight **Create a new volume** and press Enter.
5. Highlight **Create a volume that can be made bootable** and press Enter.
6. Highlight a drive letter in the list and press Enter.
7. Enter a name for the volume in the space provided and press Enter twice.
8. Highlight the disk on which the Windows partition exists and press Enter.
9. Highlight **Use existing partition** and press Enter.
10. Highlight the Windows partition and press Enter.
11. Enter a name for the partition in the space provided and press Enter.
12. Highlight the new volume and press Enter to display the **Options** menu.
13. If you do not want OS/2 to have access to the Windows partition, highlight **Hide volume from OS/2** and press Enter.

    The new Windows volume is displayed in the logical view with no drive letter and a status of *Bootable*.
14. Highlight **Save the changes and exit** and press Enter.
15. Remove the *Installation Diskette* from the diskette drive.
16. Restart the system.

After you restart the system, Boot Manager is displayed, allowing you to select any bootable volume, including the Windows partition.

Creating Installation Diskettes

You must create installation diskettes to start your system and begin the installation process if your system cannot boot from the *OS/2 Warp Server for e-business Installation CD*, or if you need to add device drivers before you begin installation. You can create installation diskettes on any system that is already started, and that has a diskette drive and a CD-ROM drive.

To create installation diskettes:

1. Gather three blank diskettes and the *Server Pak CD*.
2. Label the three diskettes as follows:
   - *Installation Diskette*
   - *Diskette 1*
   - *Diskette 2*
3. Insert the *Server Pak CD* into the CD-ROM drive.
4. Open an OS/2 window.
5. From an OS/2 command prompt, type `e:` and press Enter, where *e* is the drive letter of the CD-ROM drive.
6. At the OS/2 command prompt, type `cdinst` and press Enter.
7. At the prompt `Press any key when ready`, press Enter.
8. Insert the blank diskette labeled *Diskette 1* into the diskette drive and press Enter.

   The files are copied.
9. Remove *Diskette 1* from the diskette drive and press Enter.
10. Insert the blank diskette labeled *Diskette 2* into the diskette drive and press Enter.

    The files are copied.
11. Remove *Diskette 2* from the diskette drive and press Enter.
12. Insert the blank diskette labeled *Installation Diskette* into the diskette drive and press Enter.

    The files are copied.

    Note: You are prompted to leave the *Installation Diskette* in the diskette drive and to reboot the system. Do *not* follow the prompt. Instead, continue as instructed below.
13. Remove the *Installation Diskette* from the diskette drive and press Enter.
14. Close the OS/2 window.

Now that the installation diskettes are created, you can either add device drivers to them, or you can start the OS/2 Warp Server for e-business installation process. To add device drivers to the diskettes, see “Modifying the Installation Diskettes for New Hardware”. To start the installation process, see “Chapter 4. Installing and Configuring the Server” on page 25.

Modifying the Installation Diskettes for New Hardware

OS/2 Warp Server for e-business includes support for many device drivers; however, if support for your hardware is not included, you will need to create installation diskettes and then add the necessary device drivers to the installation diskettes before starting the OS/2 Warp Server for e-business installation. For example, you may have a hard disk controller with a CD-ROM drive attached that is not supported. If during the

installation process you receive a message stating that your CD-ROM drive is not supported, or if you are prompted to insert the CD-ROM, the necessary device driver is probably not on the installation diskettes.

To locate the device driver you need, either contact the manufacturer of the device or see the *OS/2 Device Driver Pak Online* at the following address:

```
http://service.software.ibm.com/os2ddpak/index.htm
```

Once you obtain the appropriate device driver, you can modify the installation diskettes to support new hardware in one of the following ways:

- "Adding a Device Driver to the Installation Diskettes"
- "Replacing a Device Driver on the Installation Diskettes" on page 76
- "Adding or Modifying Parameters for Existing Device Drivers" on page 76

If there is not enough space on the installation diskettes to copy the new device driver, see "Creating Space on the Installation Diskettes for Device Drivers" on page 76.

If you want to replace one or more system files with a newer version, see "Replacing System Files on the Installation Diskette" on page 77.

Adding a Device Driver to the Installation Diskettes

Use this procedure when the device driver is new and was not included with OS/2 Warp Server for e-business. If there is not enough space on the installation diskettes to copy the new device driver, see "Creating Space on the Installation Diskettes for Device Drivers" on page 76.

To add a new device driver to the installation diskettes:

1. If your device driver requires a **BASEDEV=** statement in the **CONFIG.SYS** file, add your device driver to *Diskette 1*. Otherwise, the device driver uses a **DEVICE=** statement and needs to be copied to *Diskette 2*.
2. Modify the **CONFIG.SYS** file on *Diskette 1* as follows:
   a. Make sure the following statement exists in the **CONFIG.SYS** file.
      ```
      SET SAVECONNECT=1
      ```
   b. Add the following statement to ensure the device driver is copied throughout the installation process:
      ```
      SET COPYFROMFLOPPY=1
      ```
   c. Add the appropriate statements to the **CONFIG.SYS** file:
      ```
      BASEDEV=driver_name <parameters>
      DEVICE=driver_name <parameters>
      ```

Note: If the connection to the hard disk or CD-ROM drive is lost during the installation process or when you restart your system, make sure the CD-ROM device driver statement is in the **CONFIG.SYS** file on the correct diskette, and make sure the

CD-ROM device driver is copied to the **\OS2\BOOT** directory. All device driver statements must include path information, such as `DEVICE=C:\OS2\BOOT\COM.SYS`.

Replacing a Device Driver on the Installation Diskettes

Use this procedure to install a newer version of a device driver that was included with OS/2 Warp Server for e-business. If there is not enough space on the installation diskettes to copy the new device driver, see “Creating Space on the Installation Diskettes for Device Drivers”.

To replace a device driver that resides on *Diskette 1* or *Diskette 2*:

1. Copy the new device driver file over the existing file on *Diskette 1* or *Diskette 2*.
2. Add the following statement to the **CONFIG.SYS** file on *Diskette 1*:

   ```
   SET COPYFROMFLOPPY=1
   ```

The installation program uses the new device driver and copies the necessary files to the target volume.

Adding or Modifying Parameters for Existing Device Drivers

Use this procedure when you need to add or modify parameters to device drivers, and these parameters must be copied to the target volume during installation.

To add or modify parameters for existing device drivers:

1. Modify the **CONFIG.SYS** file on *Diskette 1* as follows:
   a. Add or modify the required parameters to the desired **BASEDEV=** and **DEVICE=** statements.
   b. Make sure the following statement exists in the **CONFIG.SYS** file on *Diskette 1*:

      ```
      SET SAVECONNECT=1
      ```

The installation program copies the modified lines to the **CONFIG.SYS** file on the target volume.

Creating Space on the Installation Diskettes for Device Drivers

If you need to create free space on *Diskette 1*, depending on your system hardware configuration, you can try one or more of the following procedures before you copy the new device drivers to the installation diskettes. For each file you delete from the diskette, you must also remove the corresponding statement from the **CONFIG.SYS** file.

- If you are installing OS/2 Warp Server for e-business on a system that does not have a SCSI adapter, you can delete one or more of the following files to free up to 600KB of diskette space:

  ```
  AHA152X.ADD     DPT20XX.ADD
  AHA154X.ADD     FLASHPT.ADD
  AHA164X.ADD     IBM2SCSI.ADD
  ```

```
AHA174X.ADD     QL10OS2.ADD
AIC7770.ADD     QL40OS2.ADD
AIC7870.ADD     QL510.ADD
AIC78U2.ADD
```

- If you are installing OS/2 Warp Server for e-business on a SCSI system, you determine which SCSI adapter you are using, and then remove the SCSI drivers you are not using.

  If you have a problem starting the system after removing the SCSI drivers, you have removed the wrong drivers from *Diskette 1*. Copy the SCSI drivers from the original *Diskette 1* to the *Diskette 1* you modified.
- If you are *not* using a RAID array system, you can remove the following files to free 45KB of diskette space:

  ```
  DAC960.ADD
  IPSRAID.ADD
  ```

If you need to create free space on *Diskette 2*, you can remove certain files before you copy the new device drivers to the installation diskettes. Do not remove any files other than the ones listed below, or the installation process might have problems.

Remove one or more of the following files to free up to 89KB of diskette space:

```
TEDIT.EXE
TEDIT.HLP
RMVIEW.EXE
RMINFO.DLL
NPXEMLTR.DLL
```

Replacing System Files on the Installation Diskette

Use this procedure to install a newer version of one or more system files included on the *Installation Diskette* for OS/2 Warp Server for e-business. The system files include the following:

```
OS2KRNLI
OS2LDR
OS2LDR.MSG
OS2BOOT
```

To add a new system file or files to the *Installation Diskette*:

1. Copy the new system file or files over the existing file or files on the *Installation Diskette*.
2. Add the following statement to the **CONFIG.SYS** file on *Diskette 1* to ensure the new system file or files are copied throughout the installation process:

   ```
   SET COPYFROMFLOPPY=1
   ```

Installing MPTS with Strong Encryption

A strong encryption replacement version of Multi-Protocol Transport Services (MPTS) is provided on the *OS/2 Warp Server for e-business Security Feature CD 1*. This version of MPTS contains the SSL and IPSEC libraries used by other applications. The IPSEC libraries provide 56-bit encryption, and the SSL libraries provide 56/128-bit encryption. This version of MPTS supports strong encryption for Lotus Domino Go Webserver 4.6.2.6 and IBM WebSphere Application Server 1.1.

To install MPTS:

1. Insert the *OS/2 Warp Server for e-business Security Feature CD 1* into the CD-ROM drive.
2. Open an OS/2 window.
3. From an OS/2 command prompt, type `e:` and press Enter, where *e* is the drive letter of the CD-ROM drive.
4. Type `cd mpts` and press Enter.
5. Type `cd language` and press Enter, where *language* is the two-character abbreviation of the language version you are installing.

   Use one of the following abbreviations:

   - **br** Brazilian Portuguese
   - **cx** Simplified Chinese
   - **de** German
   - **dk** Danish
   - **en** English
   - **es** Spanish
   - **fi** Finnish
   - **fr** French
   - **it** Italian
   - **jp** Japanese
   - **nl** Dutch
   - **no** Norwegian
   - **sv** Swedish
   - **tw** Traditional Chinese
6. Type `install` and press Enter.
7. Follow the displayed installation instructions.

Installing Lotus Domino Go Webserver

Lotus Domino Go Webserver 4.6.2.6 is provided on the *OS/2 Warp Server for e-business Security Feature CD 2*. Install Lotus Domino Go Webserver before you install IBM WebSphere Application Server.

To install Lotus Domino Go Webserver:

1. Insert the *OS/2 Warp Server for e-business Security Feature CD 2* into the CD-ROM drive.
2. Open an OS/2 window.
3. From an OS/2 command prompt, type `e:` and press Enter, where *e* is the drive letter of the CD-ROM drive.
4. Type `cd ldgw` and press Enter.
5. Type `cd language` and press Enter, where *language* is the three-character abbreviation of the language version you are installing.

   Use one of the following abbreviations:

   - **cht** Traditional Chinese
   - **chs** Simplified Chinese
   - **deu** German
   - **enu** English
   - **esp** Spanish
   - **fra** French
   - **ita** Italian
   - **jpn** Japanese
   - **ptb** Brazilian Portuguese
6. Type `install` and press Enter.

   Note: Do not install the Java servlet component if you plan to install IBM WebSphere Application Server.
7. Follow the displayed installation instructions.

   The product **README** file is also displayed.

More information about Lotus Domino Go Webserver is available at the following address:

`http://www.software.ibm.com/webservers/dgw/doc461.htm`

Installing IBM WebSphere Application Server

IBM WebSphere Application Server 1.1 is provided on the *OS/2 Warp Server for e-business Security Feature CD 2*. Install Lotus Domino Go Webserver before you install IBM WebSphere Application Server.

If you have already installed Lotus Domino Go Webserver, uninstall the Java servlet component of the Lotus Domino Go Webserver before installing IBM WebSphere Application Server.

IBM WebSphere Application Server 1.1 requires the latest version of Java 1.1.7. For instructions about updating Java 1.1.7, see the **README.TXT** file on the *OS/2 Warp Server for e-business Server Pak CD*.

To install IBM WebSphere Application Server:

1. Insert the *OS/2 Warp Server for e-business Security Feature CD 2* into the CD-ROM drive.
2. Open an OS/2 window.
3. From an OS/2 command prompt, type `e:` and press Enter, where *e:* is the drive letter of the CD-ROM drive.
4. Type `cd was1_1` and press Enter.
5. Type `install` and press Enter.
6. Follow the displayed installation instructions.

   The product **README** file is also displayed.

More information about IBM WebSphere Application Server is available at the following address:

`http://www.software.ibm.com/webservers/appserv/library.html`

Autostarting Neighborhood Browser Enabler after Installation

Neighborhood Browser Enabler is installed on all servers; however it is not configured to automatically start (autostart). Neighborhood Browser Enabler should not be autostarted on every server on which it is installed. At most, it should be autostarted and run on one server out of every 20 servers in a domain.

To determine if Neighborhood Browser Enabler is running:

1. Open an OS/2 window.
2. Type `net start` and press Enter.

   A list of active services is displayed. If **BROWSER** is listed, then Neighborhood Browser Enabler is running. If **BROWSER** is not listed, then Neighborhood Browser Enabler is not running.

To start Neighborhood Browser Enabler manually:

1. Open an OS/2 window.
2. Type `net start browser` and press Enter.

   A message stating that the **BROWSER** service was started successfully is displayed.

To autostart Neighborhood Browser Enabler:

1. Open the *C*:**\IBMLAN\IBMLAN.INI** file (where ***C:*** is the installation volume) into a text editor.
2. Type `BROWSER` at the end of the **SRVSERVICES =** line.
3. Save the **IBMLAN.INI** file and exit the text editor.
4. Restart the system.

Configuring a PPP Server Ethernet Bridge after Installing OS/2 Warp Server for e-business

You do not need to configure an Ethernet Bridge if all your remote access clients are PPP clients.

If you configure an Ethernet Bridge through the LAN Distance Settings notebook, Settings modifies the **PROTOCOL.INI** file as follows:

- Replaces the Ethernet adapter in the Bindings statements for NetBEUI and TCPBEUI with the LAN Distance logical adapter.
- Modifies and deletes statements in the NetBIOS section based on changes to the Bindings statements for NetBEUI and TCPBEUI.

This reconfiguration might affect your LAN Server configuration.

The following example demonstrates how your LAN Server configuration could be affected by the configuration of an Ethernet Bridge.

Your system was configured as follows prior to configuration of the Ethernet Bridge:

- The MPTS adapters and protocols configuration panel displays the following:
  - IBM LAN Adapter for Ethernet [IBMENI.OS2]...

    ```
    0 - IBM OS/2 NetBIOS
    0 - IBM TCP/IP
    2 - IBM OS/2 NetBIOS over TCP/IP
    ```

  - LAN Distance Logical Adapter...

    ```
    1 - IBM TCP/IP
    1 - IBM OS/2 NetBIOS
    ```

- The networks section in the LAN Server configuration file, **IBMLAN.INI**, contains the following statements:

  ```
  net1 = NETBEUI$,0,LM10,34,70.14
  net2 = NETBEUI$,1,LM10,34,70.14
  net3 = TCPBEUI$,2,LM10,34,70.14
  ```

After the configuration of the Ethernet Bridge, your system is configured as follows:

- The MPTS adapters and protocols configuration panel displays the following:
  - LAN Distance Logical Adapter...

    ```
    0 - IBM OS/2 NetBIOS
    2 - IBM OS/2 NetBIOS over TCP/IP
    1 - IBM TCP/IP
    ```

– IBM LAN Adapter for Ethernet [IBMENI.OS2]...

```
1 - IBM TCP/IP
1 - [SR_BRIDGE]
```

– [BRIDGEFH]...

```
1 - [SR_BRIDGE]
```

- The networks section in the LAN Server configuration file, **IBMLAN.INI**, still contains the following statements:

```
net1 = NETBEUI$,0,LM10,34,70.14
net2 = NETBEUI$,1,LM10,34,70.14
net3 = TCPBEUI$,2,LM10,34,70.14
```

With this configuration, the following error is displayed when you shutdown and restart the system:

```
NET3406: An error occurred while opening network device drive net2=NETBEUI$
NET3411: There was an error installing NETWKSTA.200
```

To correct the configuration:

1. Open the **OS/2 LAN Services** folder.
2. Open the **OS/2 LAN Services Installation/Configuration** program.
3. Follow the **LAN Services Adapters** configuration panels until the **Adapter and Protocol Configuration** panel is displayed.
4. Add **IBM OS/2 NetBIOS** and **IBM OS/2 NetBIOS over TCP/IP** under the Ethernet adapter.

   Note: If you do not make any changes in the configuration panel, the program automatically corrects the **IBMLAN.INI** file settings based on your current adapter and protocol configuration when you apply the changes. However, remote clients cannot access resources on your LAN for those networks that are removed.

When you are finished configuring LAN Services, the **IBMLAN.INI** file remains unchanged.

The MPTS adapters and protocols configuration panel displays the following:

- IBM LAN Adapter for Ethernet [IBMENI.OS2]...

```
0 - IBM OS/2 NetBIOS
0 - IBM TCP/IP
2 - IBM OS/2 NetBIOS over TCP/IP
0 - [SR_BRIDGE]
```

- LAN Distance Logical Adapter...

```
1 - IBM TCP/IP
1 - IBM OS/2 NetBIOS
```

- [BRIDGEFH]...

```
1 - [SR_BRIDGE]
```

Note: For more information about changing these settings after the initial configuration, see *MPTS Configuration Guide*.

Appendix A. File System Comparison Chart

The chart on the following pages compares the characteristics of four file systems: JFS, 386 HPFS, HPFS, and FAT.

Note that when 386 HPFS is installed, it *replaces* HPFS.

Table 3. File System Comparison: JFS, 386 HPFS, HPFS, and FAT

Characteristic	Journaled File System (JFS)	386 High Performance File System (386 HPFS)	High Performance File System (HPFS)	FAT File System
Maximum volume size	2TB (terabytes)	64GB (gigabytes)	64GB (gigabytes)	2GB (gigabytes)
Maximum file size	2TB (terabytes)	2GB (gigabytes)	2GB (gigabytes)	2GB (gigabytes)
Maximum file name length	254 characters (bytes)	254 characters (bytes)	254 characters (bytes)	11 (8.3 format) characters
Allows spaces and periods in file names	Yes	Yes	Yes	No; however, a period is required between file name and extension
Standard file and directory attributes (bit flags)	Within file system	Within file system	Within file system	Within file system
Extended attributes (64KB text or binary with keywords)	Within file system	Within file system	Within file system	In a separate file
Maximum path length	260 characters (bytes)	260 characters (bytes)	260 characters (bytes)	64 characters (bytes)
Bootable file system	No	Yes	Yes	Yes
Logical volume type	LVM only	LVM or compatibility (must be compatibility for Fault Tolerance)	LVM or compatibility	LVM or compatibility
Allows dynamic volume expansion	Yes	No	No	No
File system scales up when using SMP	Yes	No	No	No
Allows for fault tolerance	No	Yes	No	No
Allows for local security	No	Yes	No	No
Requires a separate proof of license during installation	No	Yes	No	No
Average wasted space per file	1/2 block size (256 to 2048 bytes)	1/2 sector (256 bytes)	1/2 sector (256 bytes)	1/2 cluster (1KB to 16KB), approximately 0.001% of volume
Allocation information for files	Near each file in its INODE	Near each file in its FNODE	Near each file in its FNODE	Centralized near front of volume
Free disk-space information	Centralized in file structure represented by B+tree	Located near free space in bit maps	Located near free space in bit maps	Centralized near front of volume

Table 3. File System Comparison: JFS, 386 HPFS, HPFS, and FAT (continued)

Characteristic	Journaled File System (JFS)	386 High Performance File System (386 HPFS)	High Performance File System (HPFS)	FAT File System
Directory structure	Sorted B+tree	Sorted B-tree	Sorted B-tree	Unsorted linear list; must be searched exhaustively
Directory location	Close to files it contains	Located near seek center of volume	Located near seek center of volume	Root directory at front of volume; others scattered
Read-ahead	32MB	Sensitive to data type	Cache reads in 8KB blocks	Optional
Cache replacement strategy	Segmented least recently used (LRU) algorithm	Sensitive to data type	Modified least recently used (LRU) algorithm	Simple least recently used (LRU) algorithm
Write-behind (lazy write)	Optional; can be handled on a per-file basis	Optional; can be handled on a per-file basis	Optional; can be handled on a per-file basis	Optional; can be handled on a per-file basis
Caching program	None; lazy write parameters can be set on the IFS=JFS.IFS line in the CONFIG.SYS file)	CACHE386.EXE (values specified for the IFS and RUN statements in the CONFIG.SYS file) and HPFS386.INI	CACHE.EXE (in the CONFIG.SYS file)	DISKCACHE (in the CONFIG.SYS file)
Maximum cache size	Physical memory available	Physical memory available	2MB	14MB
Cache threshold	No cache threshold	Sensitive to data type	Variable, up to 64KB	Variable, up to 64KB; 3.5KB default
LAN Server access control lists	Within file system	Within file system	In separate file (NET.ACC)	In separate file (NET.ACC)

Appendix B. Troubleshooting Installation Problems

If you experience problems during installation or immediately after installation, use this section to help you determine the cause of the problem and to find the solution.

If you experience problems after a successful installation of OS/2 Warp Server for e-business, see *Serviceability and Troubleshooting Guide* for more information.

CD-ROM Drive Not Detected

If during the installation process you receive a message stating that your CD-ROM drive is not supported, or if you are prompted to insert the CD-ROM, the necessary device driver is probably not on the installation diskettes. See “Modifying the Installation Diskettes for New Hardware” on page 74 for instructions on how to add your CD-ROM device driver to the installation diskettes. More information about specific CD-ROM devices is available in *Serviceability and Troubleshooting Guide*.

VCU Has Detected Corrupt Partitions

The system may issue the following message during installation when *Diskette 2* is in the diskette drive:

```
"VCU has detected corrupted partition tables on physical drive xx."
```

```
"VCU has detected corrupt partitions on 1 or more physical drives. If you
continue, data on these drives may be lost. It is recommended that you back up
all data before continuing. Do you wish to continue? Y/N"
```

At this point, the installation process has merely detected the corruption and has not yet written any data to the drive.

If you choose Y to continue, the installation process removes the corrupt partitions on the listed drives and allows you to continue. Any existing data on the corrupt partitions is lost.

If you choose N to stop the installation, the following message is displayed:

```
"Installation aborted. No volumes have been created. Please refer to the
Installing and Configuring the Server chapter of Quick Beginnings: Installing
OS/2 Warp Server for e-business."
```

```
"Press and hold the Ctrl, Alt, and Del keys to reboot."
```

LVM is more sensitive to discrepancies in the partition table than were previous versions of OS/2; therefore, previous versions of OS/2 might not have detected the

corruption. It might be possible to work around this problem by backing up all data on the affected drives using your existing operating system.

Backing Up Data on a Corrupted Partition during Installation

If you receive the messages described above, perform the following steps:

1. Remove *Diskette 2* from the diskette drive.
2. Restart the system.
3. Note the layout of the existing partitions on the drives with the corrupt partitions. If you are using a previous version of OS/2, you can use the `FDISK /QUERY` command to quickly gather this information.
4. Back up all data on all the partitions that are on the physical drives listed as corrupt.
5. Restart the OS/2 Warp Server for e-business installation process as described in “Preparing the System” on page 27.
6. When you receive the message indicating that the partitions are corrupt, choose Y to continue the installation.
7. When the **Installation Volume Selection** screen is displayed, select **Specify a different volume**. This option executes LVM, where you can re-create the partitions that were removed. See “Selecting the Installation Volume” on page 28 for more information.

   Using the LVM utility, make sure that the correct volume is set as *installable*, and make sure there is a drive letter assigned to the volume. See “Setting the Installation Volume with Logical Volume Manager” on page 29 for more information.

   Be sure to save the changes and exit LVM.
8. Continue the installation as directed.

   The disk partitioning is complete. If you are prompted to restart the system so that the partitions and volumes can be recognized during installation, follow the prompts on the screen to restart the system and continue installation.

   After the system is restarted, follow the prompts until the **Installation Volume Selection** screen is displayed. Make sure that the correct installation volume is displayed, and then select **Accept the default volume**.

   After you have selected the installation volume, the **Formatting the Installation Volume** screen is displayed. For help with formatting the installation volume, see “Formatting the Installation Volume” on page 32.
9. Restore the data onto the new volumes that you had backed up from the original partitions.

Partition Cannot Be Made Bootable

If you receive the message `"The selected partition cannot be made bootable"` while attempting to create a bootable volume, the following scenario and solution will help you correct the problem.

If you want to keep your existing C: drive available with its own operating system, and then set up D: as the target compatibility volume for installing OS/2 Warp Server for e-business, you must first install Boot Manager. Only one volume is bootable unless Boot Manager is installed.

Log Files Created during Installation

Each network component and service produces log files as it is installed. These log files are stored in subdirectories under **\IBMINST\LOGS**. The following tables list the directory name, file name, and contents of each log file created during installation.

Table 4. Installation Log Files Created in \IBMINST\LOGS Directory

Subdirectory	Filename	File Contents
	CLNDESK.LOG	Desktop Shuffler log
	TOPINST.LOG	Top installation main log
\CONINST\	CONINST.LOG	Coninst log
\FFST\	LOCAL.LOG	FFST log
\IBMINST\	MKRSP.LOG	Building response file log
\TCPAPPS\	TCPINST1.LOG	TCP/IP log
\TCPAPPS\	TCPINST2.LOG	TCP/IP log
\LOCINSTU\	LOCAL.L2	Network product installation status, including log of products installed
\LS\	LOCAL.INS	LAN Server installation errors log
\LS\	LOCAL.SRV	LAN Server installation log
\MPTS\	LOCAL.MPT	MPTS installation log
\PSNS\	CIDERR.LOG	PSnS installation errors log
\PSNS\	CIDHIST.LOG	PSnS installation log
\BOOKS\	LOCAL.BKS	Books installation log
\NETSCAPE\	LOCAL.NET	Netscape installation log
\PPPSRV\	PPP.LOG	Remote Access Services installation log
\PPPSRV\	PPPCFG.LOG	Remote Access Services configuration log
\PSF\	LOCAL.LOG	Print Services Facility installation log
\PSF\	LOCAL.HST	Additional Print Services Facility installation log
\LCFAGENT\	LOCAL.LCF	Tivoli Management Agent (TMA) installation log
\LDAP\	LDAPERR.LOG	LDAP installation error log
\LDAP\	LDAPHST.LOG	LDAP installation log

Table 5. Installation Log Files Created in \IBMLAN\LOGS Directory

Filename	File Contents
MESSAGES.LOG	LAN Server log
SCHED.LOG	LAN Server log

Table 6. Installation Log Files Created in \MMOS2\INSTALL Directory

Filename	File Contents
MINSTALL.LOG	Multimedia installation and configuration log

Table 7. Installation Log Files Created in \OS2\INSTALL Directory

Filename	File Contents
CD.LOG	Multimedia detection of CD-ROM information
CURRENT.LOG	Log of current installed items by feature install
DSPINSTL.LOG	Video display drivers log
FFSTINST.LOG	FFST log
IBMLSHST.LOG	LAN Server history log
INST_L1.LOG	Log created by Netscape
INSTALL.LOG	Base installation main log
LAPSHIST.LOG	MPTS history log
OS2MM.LOG	Multimedia detection of card, windows, etc.
TCPINST.LOG	TCP/IP log
WALINST.LOG	PPP Server installation module log
WINOS2.LOG	WIN-OS/2 installation path log
WPINSTAL.LOG	History log of installed items by feature install

Table 8. Installation Log Files Created in \OS2\INSTALL\NETSCAPE Directory

Filename	File Contents
NETSCAPE.LOG	Netscape installation log

Problems During Diskette Portion of Installation

If you experience problems while using the diskettes during installation, perform the following steps:

1. Place the *Installation Diskette* in the diskette drive and restart the system.
2. When the white band **OS/2** displays in the upper-left corner of the screen, press Alt+F1.
3. From the Election window, press F6 to disable detection of the hardware.

If the above procedure does not work, perform the following steps to identify the device driver that is attempting to load during installation:

1. Make a backup copy of your installation diskettes and make the modifications to the backup diskettes instead of to the original diskettes.

2. Insert the backup *Installation Diskette* in the diskette drive and restart the system.
3. When the white band **OS/2** displays in the upper-left corner of the screen, press Alt+F2 to display the **Loading Device Driver** window.
4. Edit the **CONFIG.SYS** file on the backup *Installation Diskette* and comment out the statement of the device driver that would not load.
5. Restart the system.

Installing to a Laptop System

Laptop systems, including the IBM ThinkPad series, have rapidly changing hardware device support. In most cases, you will need to get device drivers for video display, audio, and PCMCIA devices from your hardware vendor.

It is recommended that you select a VGA display, no audio, and no PCMCIA during the initial installation of OS/2 Warp Server for e-business on a laptop system. After the initial installation, you can update and configure the devices using the device drivers and instructions from your hardware vendor. In many cases, these device drivers are included with your laptop system, or they are available on the Internet.

You can find device drivers for IBM ThinkPad systems at the following address:

`http://service.software.ibm.com/os2ddpak/index.htm`

See “Modifying the Installation Diskettes for New Hardware” on page 74 for more information about updating device drivers after the initial installation.

Problems Installing to an IBM ThinkPad

If you are installing OS/2 Warp Server for e-business on an IBM ThinkPad 600, 760, or 770 series system, you must first disable busmastering for the ThinkPad’s IDE controller. By default, busmastering is enabled. If busmastering is not disabled, the following problems may occur:

- Extremely slow installation
- Prolonged hard disk activity
- Appearance of system stop during hard disk accesses

To disable busmastering for the ThinkPad’s IDE controller:

1. Modify the **CONFIG.SYS** file on *Diskette 1* as follows:
   a. Change the existing **BASEDEV** statement from `BASEDEV=IBM1S506.ADD` to `BASEDEV=IBM1S506.ADD /A:0 /!BM`.
   b. Verify that the change is still present in the system’s **CONFIG.SYS** file after the installation process is completed.

Display Problems after Installation

- **Desktop Display Problems**

  Refresh rate selection for many display drivers is available through the **System** object located in the **System Setup** folder on page 2 of the **Screen** notebook tab. If this page does not exist for your display driver and the refresh rate for the resolution you selected is configured incorrectly, you might experience problems such as:

  – The Desktop is compressed into a narrow, horizontal band
  – Multiple images of the Desktop are visible
  – Diagonal lines fill the Desktop
  – The video display flickers

  It might be possible for you to manually configure the refresh rate using a configuration utility that may have been provided with your graphics adapter. Follow the instructions provided by the manufacturer to set the refresh rate.

  If the configuration utility is a DOS program, then the utility must be run in a DOS full screen session and not in a DOS window. When you are finished running a DOS configuration utility, you must run **SVGA ON** in the same DOS full screen session to generate the data file named **SVGADATA.PMI**. The **SVGADATA.PMI** file contains graphics adapter information used in setting modes and refresh rates.

- **System Error on IBM PC Server with Cirrus Logic Adapter**

  If you installed the IBM PC Server 320 with MicroChannel BUS and Cirrus Logic 5430 graphics adapter, you might receive a system error when you restart the system. To prevent this error, obtain a copy of the latest system BIOS from the following address:

  `http://www.pc.ibm.com`

Appendix C. Partitioned Removable Media Considerations

LVM supports partitioned removable media (PRM), such as Iomega Zip drives and Jaz drives, as either LVM or compatibility volumes.

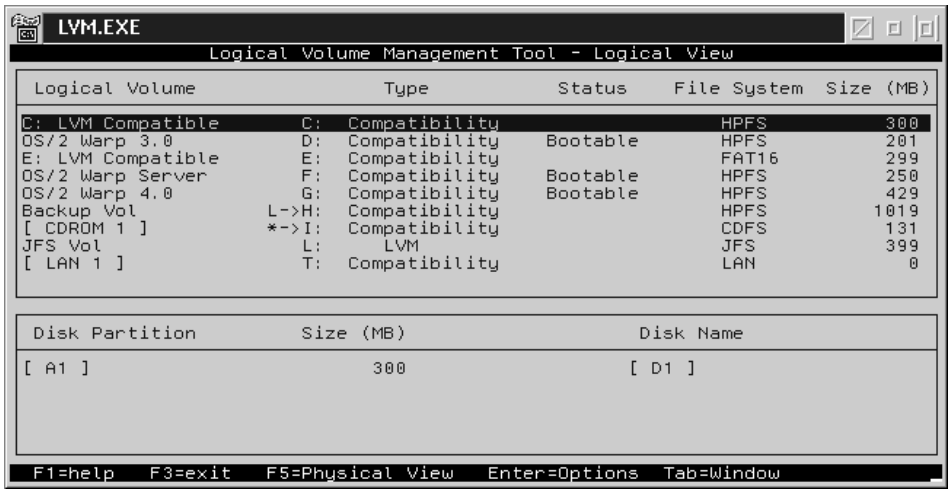

Figure 13. The LVM logical view displays partitioned removable media volumes.

In the figure above, the drive letter *preferences* are displayed on the left, and the actual drive letter assignments are diplayed on the right.

Both types of volumes on PRM devices support assignable drive letters with the following considerations:

- Disk spanning is not supported across removable media. Partitions that are part of a logical volume that spans disks cannot reside on removable media.
- Removable media volumes have assigned drive letters that are treated as preferences. When a removable media volume is mounted, its assigned drive letter is used, if available. Otherwise, the first available drive letter is assigned to the volume.
- If a PRM device contains no media, then no drive letter is assigned to it. This is different from previous versions of OS/2, where drive letters were always present whether or not media was inserted.
- If a PRM device contains unformatted media, a temporary volume is created for it, and the next available drive letter is assigned to it. If you subsequently format the media without first partitioning it using LVM, the device behaves as if it were a large diskette (Big Floppy Mode media). For example, it is always assigned the next drive letter, and it can be formatted only with the FAT file system. This is how these devices behaved prior to OS/2 Warp Server FixPak 6.
- If a PRM device contains media that has been previously formatted as a large diskette (Big Floppy Mode media), such as cartridges that were formatted before OS/2 Warp Server FixPak 6, it continues to behave as if it were a large diskette.

- If a PRM device contains media that has partitions defined, but has no volumes defined (such as partitions created using the PRM support introduced with OS/2 Warp Server FixPak 6 or on a Windows system), LVM creates a temporary volume for each partition and assigns a temporary, next available drive letter for each temporary volume. If you subsequently convert a partition to a volume using LVM to assign a drive letter preference, then only the volumes are mounted. In other words, the unconverted partitions are no longer mounted after at least one volume has been defined on the cartridge.
- If you create volumes on a cartridge, the volumes are mounted according to the drive letters you assigned. Drive letter preferences are stored on the cartridge. Therefore, if you move the cartridge to another OS/2 Warp Server for e-business system, the drive letters you assigned to the volumes on the cartridge are always used, *provided there are no conflicts with existing drives on the new system*.
- Drive letter preferences are preserved across only OS/2 Warp Server for e-business systems. If you insert the same cartridge into a legacy OS/2 or Windows system, the drive letter preferences you assigned to it in LVM are ignored.
- If a PRM device contains media, and if the media contains volumes, then the volumes are assigned drive letters. Partitions that do not belong to volumes are hidden.
- If you make changes to the PRM media using LVM, then all of its temporary volumes become permanent volumes, and the drive letter preferences are written to the PRM.
- If you eject media from a PRM device, regardless of whether the media is partitioned or is used as a large diskette (Big Floppy Disk mode), its drive letter disappears and is available for use. This behavior is different from previous versions of OS/2, where the drive letters were always present whether or not media was inserted.
- OS/2 cannot automatically detect when a cartridge is inserted. As a result, you might need to refresh the **Drives** object on the Desktop to see the volumes after you insert the cartridge. OS/2 automatically refreshes drives under the following circumstances:
  - When you run LVM in text mode or in GUI mode.
  - When you or a program attempts to access a drive letter that does not exist.
- PRM device drives are not refreshed while LVM is running; however, other drives *are* refreshed (discovered) while LVM is running.

Note: The category of PRM devices does not include 3.5-inch diskette drives.

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