HP-UX 11i v3 Installation and Update Guide

HP Integrity Server Blades, HP Integrity Servers, and HP 9000 Servers

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Legal Notices

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About This Document

This guide describes installing (called cold-installing) HP-UX 11i v3 (B.11.31) and updating from the following paths:

- HP-UX 11i v2 (B.11.23) PA-RISC to HP-UX 11i v3 (B.11.31) PA-RISC
- HP-UX 11i v2 (B.11.23) Intel Itanium® to HP-UX 11i v3 (B.11.31) Intel Itanium®

The document printing date and part number indicate the document's current edition. The printing date will change when a new edition is printed. Minor changes may be made at reprint without changing the printing date. The document part number will change when extensive changes are made. Document updates may be issued between editions to correct errors or document product changes.

The latest version of this document can be found online at the HP Technical Documentation website:

http://docs.hp.com/en/oshpux11iv3.html

Intended Audience

This document is intended for system administrators responsible for installing, configuring, and managing HP-UX 11i v3 on HP Integrity Servers and HP 9000 Servers. Administrators are expected to have knowledge of operating system concepts, commands, and configuration.

This document is not a tutorial.

Publishing History

To ensure that you receive the latest edition, you should subscribe to the appropriate product support service. Contact your HP sales representative for details.

Table 1 Publishing History Details

Document Manufacturing Part Number	Operating Systems Supported	Supported Product Versions	Publication Date
5992-5795	HP-UX 11i v3	B.11.31	March 2009
5992-4165	HP-UX 11i v3	B.11.31	September 2008
5992-3364	HP-UX 11i v3	B.11.31	March 2008
5992-5741	HP-UX 11i v3	B.11.31	September 2007 (Edition 2.2,Web Only)
5992-4043	HP-UX 11i v3	B.11.31	September 2007 (Edition 2.1, retired)

Table 1 Publishing History Details *(continued)*

Document Manufacturing Part Number	Operating Systems Supported	Supported Product Versions	Publication Date
5992-0689	HP-UX 11i v3	B.11.31	September 2007 (Edition 2, retired)
5991-6460	HP-UX 11i v3	B.11.31	February 2007

Document Organization

The *HP-UX 11i v3 Installation and Update Guide* is divided into chapters and appendixes, which contain information about installing and updating HP-UX 11i v3.

IMPORTANT: The *HP-UX 11i v3 Read Before Installing or Updating* DVD booklet that comes with the HP-UX 11i v3 media contains last-minute cold-install and update information that was not available when this guide was published. Make sure to review the booklet before continuing.

- Chapter 1: "Welcome to HP-UX 11i v3" (page 17)

  Use this chapter to learn about the media kit contents and Operating Environments of **HP-UX 11i v3 (B.11.31)**.

- Chapter 2: "System Requirements for Cold-Installing and Updating" (page 21)

  Use this chapter to learn about the system requirements either to cold-install or update to HP-UX 11i v3.

- Chapter 3: "Choosing an Installation Method" (page 31)

  Use this chapter to help you decide the most appropriate method to install HP-UX 11i v3 on your system.

- Chapter 4: "Preparing to Cold-Install or Update to HP-UX 11i v3" (page 47)

  Use this chapter to learn the details of the required and recommended tasks to prepare your system for HP-UX 11i v3. This chapter also includes additional information about required, recommended, and optional software installed with HP-UX 11i v3.

- Chapter 5: "Cold-Installing HP-UX 11i v3 From Media" (page 61)

  Use this chapter to learn how to cold-install the HP-UX 11i v3 Operating System (OS). Alternative cold-install methods such as installing from depots or from golden images are also discussed.

- Chapter 6: "Updating to HP-UX 11i v3" (page 77)

  Use this chapter to learn how to update your system to HP-UX 11i v3 using `update-ux`.

- Chapter 7: “Installing HP Applications and Patches” (page 97)

  Use this chapter to learn how to update applications on your system that are not installed or updated with HP-UX 11i v3 OEs.
- Chapter 8: “Verifying System Install or Update” (page 103)

  Use this chapter to learn how to verify a successful install or update to HP-UX 11i v3.
- Appendix A (page 105)

  Use this appendix to learn about the known problems and troubleshooting steps for the install and update.
- Appendix B (page 127)

  Use this appendix to learn about the effect of two VxFS tunables, `vx_ninode` and `vxfs_bc_bufhwm`, on system memory consumption and learn about the guidelines on setting them for machines with relatively low RAM.
- Appendix C (page 129)

  Use this appendix to learn about installing versions of VxFS and VxVM.
- Appendix D (page 133)

  Use this appendix to learn about the new OEs and media contents.

Typographic Conventions

The following table describes the typographic conventions used in this guide.

Table 2 Typographic Conventions

Typeface	Usage	Examples
Italics	New terms, book titles, emphasis, or variables to be replaced by a name or value.	*Ignite-UX Reference* bootsys -R *release*
Key	The name of a keyboard key. Note that **Return** and **Enter** both refer to the same key.	**Esc**
Bold	The defined use of an important word or phrase.	**golden image**
`Computer`	Computer output, file contents, files, directories, software elements such as command options, function names, and parameters.	The DVD drive is connected at `/dev/dsk/c0t0d0`. `ignite`
`UserInput`	Commands and other text that you type.	**`bootsys -r`**

Table 2 Typographic Conventions *(continued)*

Typeface	Usage	Examples
[ ]	The contents are command options. If the contents are a list separated by |, choose one of the items.	ls [-a] `mount [suid | nosuid ]`
. . .	The scrolling content is replaced to indicate extensive computer output or an excerpt.	. . . `cfg "Golden System" {`

HP-UX Release Name and Release Identifier

Each HP-UX 11i release has an associated release name and release identifier. The *uname*(1) command with the `-r` option returns the release identifier. Table 3 lists the releases available for HP-UX 11i.

Table 3 HP-UX 11i Releases

Release Identifier	Release Name	Supported Processor Architecture
B.11.11	HP-UX 11i v1	PA-RISC
B.11.23	HP-UX 11i v2	Intel® Itanium® and PA-RISC
B.11.31	HP-UX 11i v3	Intel® Itanium® and PA-RISC

Related Documents

This section discusses documentation for and other sources of information about HP-UX 11i v3.

HP-UX 11i v3 Resources

The following sources provide detailed information about HP-UX 11i v3:

- **HP-UX 11i v3 Instant Information DVD**

  The Instant Information DVD provides HP-UX documentation supporting the release.

- **Manual Pages (manpages)**

  For the HP-UX 11i v3 release, the manual pages (manpages) are available on the HP-UX Welcome Page of your system, on the Instant Information DVD in the *HP-UX Reference* document, through the use of the `man` command, and on the HP Technical Documentation website: http://docs.hp.com/en/oshpux11iv3.html

- **HP-UX Welcome Page**

  The HP-UX Welcome Page on your HP-UX 11i v3 system contains pointers to information to help you use your HP-UX system.

- **Release Notes**

  The *HP-UX 11i v3 Release Notes* describe what is new, has changed, and has been deprecated or obsoleted in the current release compared to the previous HP-UX 11i v3 release.

  You can find the release notes in the following locations:

  — HP-UX Instant Information DVD. See "Media Kit Contents" (page 19) for more information.

  — The HP Technical Documentation website:

  http://docs.hp.com/en/oshpux11iv3.html

  Here you will find the release notes pertinent to previous releases of HP-UX, as well as release notes for various individual products.

- **README (Read Before Installing) Documents**

  README documents or Read Before Installing (RBI) media booklets contain information about the installation process that may not appear in this *HP-UX 11i v3 Installation and Update Guide.* Any product contained in the release may have a README document, so several README documents may be included. The *HP-UX 11i v3 Read Before Installing or Updating* booklet is included with your media kit.

- **White Papers on HP-UX**

  White papers associated with the HP-UX 11i v3 release are available at the HP Technical Documentation website:

  http://docs.hp.com/en/oshpux11iv3.html

  Other white papers, including an HP-UX 11i v3 overview, can be found at the HP-UX Information Library at the HP website:

  http://h20338.www2.hp.com/hpux11i/cache/324537-0-0-0-121.html

You can find additional information about HP-UX 11i v3 at the HP Technical Documentation website in the **HP-UX 11i v3 Operating Environments** collection under **Installing and Updating**:

http://docs.hp.com/en/oshpux11iv3.html

Other documents in this collection include:

- *Read Before Installing or Updating* (RBI)
- *HP-UX System Administrator's Guide*
- *Ignite-UX Administration Guide*

- *Software Distributor Administration Guide*
- *nPartition Administrator's Guide*

Some or all of these documents are available on the Instant Information DVD and in printed form.

Other HP Web Resources

The following websites provide a variety of information regarding the HP-UX 11i v3 release:

- HP Integrity Server Family:
  http://www.hp.com/go/integrity
- HP-UX 11i on Integrity Server Blades:
  http://www.hp.com/go/hpuxblade
- HP-UX 11i v3 for HP Integrity and HP 9000 Servers:
  http://www.hp.com/go/hpux11iv3
- HP 9000 Server Family:
  http://www.hp.com/go/hp9000
- HP Software Depot:
  http://www.hp.com/go/softwaredepot
- HP Software Releases and Media:
  http://www.hp.com/softwarereleases/releases-media2/index.html
- HP Apache-based Web Server documentation:
  http://www.hp.com/go/webserver
  After installation of HP-UX 11i v3, all HP-specific documentation is included in the `/opt/hpws/apache/hpws_docs/` directory.
- HP Technical Documentation feedback form:
  http://docs.hp.com/en/feedback.html
- HP-UX 11i v3 documentation, including release notes, guides, and white papers:
  http://docs.hp.com/en/oshpux11iv3.html
- HP OpenView product manuals:
  http://ovweb.external.hp.com/lpe/doc_serv/
- HP-UX 11i v3 information:
  http://forums.itrc.hp.com
  http://www.hp.com

- High-availability products:
  http://docs.hp.com/hpux/ha
- Ignite-UX information and download:
  http://docs.hp.com/en/IUX/
- HP Insight Power Manager:
  http://www.hp.com/go/ipm
- Latest hardware support tools (diagnostics) information, including STM and EMS Hardware Monitors:
  http://docs.hp.com/hpux/diag
- International information:
  http://www.hp.com
  Select a country or region if you are not automatically directed.
- Localized user guides:
  http://docs.hp.com
  Use the navigation menu to select a language.
- Partition Manager
  http://docs.hp.com/en/PARMGR2/
- HP Systems Insight Manager:
  http://www.hp.com/go/hpsim
- Software Distributor:
  http://www.docs.hp.com/en/SD/
- HP-UX Software Assistant:
  https://www.hp.com/go/swa
- System administration for HP-UX systems:
  http://docs.hp.com/en/oshpux11iv3 http://forums.itrc.hp.com
- System firmware: http://www.docs.hp.com/en/hw.html#System%20Firmware

HP Encourages Your Comments

HP encourages your comments concerning this document. We are truly committed to providing documentation that meets your needs.

Please send comments to: http://docs.hp.com/en/feedback.html

Please include document title, manufacturing part number, and any comment, error found, or suggestion for improvement you have concerning this document. Also, please include what we did right so we can incorporate it into other documents.

1 Welcome to HP-UX 11i v3

This chapter introduces you to the OEs of HP-UX 11i v3 (B.11.31). It also describes the media kit contents.

What You Will Find in This Chapter

- "Introduction to HP-UX 11i v3" (page 17)
- "Original HP-UX 11i v3 Operating Environments" (page 18)
- "New HP-UX 11i v3 Operating Environments" (page 18)
- "Media Kit Contents" (page 19)

Introduction to HP-UX 11i v3

HP-UX 11i v3 is an enterprise release delivering the highest level of integrated virtualization and automation. HP-UX 11i v3 dynamically reduces complexity and cuts deployment times to maximize return on investment.

Some key highlights of HP-UX 11i v3 include: advancements in performance, integrated multi-pathing, new security and availability offerings which provide increased resiliency, layered security and in-depth protection, Hyper-Threading (HT) Technology support using Dynamic LCPU, and multi-OS management across HP-UX and other HP supported operating systems. HP-UX 11i and Virtual Server Environment (VSE) solutions accelerate deployment times.

With the March 2008 release, HP began offering new HP-UX 11i v3 Operating Environments. Operating Environments (OEs) are tested and integrated application bundles designed to work with the operating system and provide the functionality needed for your system's purpose. The new Operating Environments, which offer a richer set of products, are available only for HP-UX 11i v3. Customers requiring versions 1 or 2 of HP-UX 11i may still purchase the original set of Operating Environments through the end of their planned sales life. For detailed information on the new HP-UX 11i v3 Operating Environments, please see www.hp.com/go/hpux11iv3.

Original HP-UX 11i v3 Operating Environments

The March 2008 release of HP-UX 11i v3 was the last full Operating Environments Update Release (OEUR) provided for the following original HP-UX 11i Operating Environments (OEs):

- Foundation OE
- Enterprise OE
- Mission Critical OE
- Technical Computing OE

Although the end of sale for HP-UX 11i v3 media of original Operating Environments (March 2008 release) is October 30th 2008, customers may still continue to purchase licenses for these products. These licenses, along with Operating Environment media for version 1 and version 2 will also be available until the planned end of sales life for the original OEs.

Information on transition, support, and mapping from original to new v3 Operating Environments can be found at

http://www.hp.com/go/tov3oes

New HP-UX 11i v3 Operating Environments

The March 2009 release represents HP's third release of new Operating Environments for version 3 of HP-UX 11i. These new Operating Environments, described below, provide a richer set of products and improved choices over the original set of HP-UX 11i OEs.

For lists of the bundles in each OE, see Appendix D (page 133).

Table 1-1 New HP-UX 11i v3 Operating Environments

HP-UX 11i v3 OE	Description
Base OE (BOE)	Provides integrated HP-UX functionality for cost-conscious customers. The BOE contains all the applications included in the Foundation OE, and improves the bundle set by adding much-requested products such as PRM, APA, as well as math libraries and graphics for technical computing applications. This OE is bundled as `HPUX11i-BOE`.
Virtual Server OE (VSE-OE)	Designed for customers seeking higher resource utilization or embarking on consolidation projects and need virtualization for a flexible UNIX environment. The VSE-OE contains all the products included in the BOE (and the original EOE) and adds a host of other products including the entire VSE Suite. This OE is bundled as `HPUX11i-VSE-OE`.

Table 1-1 New HP-UX 11i v3 Operating Environments *(continued)*

HP-UX 11i v3 OE	Description
High Availability OE (HA-OE)	For customers requiring high availability for large mission critical applications, this OE contains all the products included in the BOE (and the original EOE), plus applications such as HP Serviceguard and HA toolkits required to enable a mission-critical server. This OE is bundled as `HPUX11i-HA-OE`.
Data Center OE (DC-OE)	For customers who need both flexibility and high availability, the Data Center OE provides mission critical virtualization by combining the robust product selection in the VSE-OE and HA-OE in one integrated and tested bundle. This OE contains all the products included in the BOE, VSE-OE, HA-OE (and the original MCOE) and is bundled as `HPUX11i-DC-OE`.

Media Kit Contents

This guide is part of the HP-UX 11i v3 media kit, which includes the following DVDs and documents:

- **HP-UX 11i v3 (B.11.31) DVD (2-DVD set)** — Contains the HP-UX Operating System (OS), Operating Environments (OEs), required networking software, Update-UX, Ignite-UX, and online diagnostics.
- **HP-UX 11i v3 (B.11.31) Applications DVD** — Contains HP-UX application software.
- **HP-UX 11i v3 Instant Information DVD** — Contains HP-UX manuals, release notes, and white papers. See the DVD booklet for more information.
- ***HP-UX 11i v3 Read Before Installing or Updating*** — Provides last-minute information for HP-UX 11i v3. Read this booklet before cold-installing or updating HP-UX. The booklet is also available on the HP Technical Documentation website:

  http://docs.hp.com/en/oshpux11iv3
- ***HP-UX 11i Version 3 Release Notes*** — Describes new features and functionality changes for HP-UX 11i v3. Release Notes are available on the Instant Information DVD and on the HP Technical Documentation website:

  http://docs.hp.com/en/oshpux11iv3
- ***HP-UX 11i v3 Installation and Update Guide*** (this document) — Describes the media kit and instructions to cold-install or update to the latest release of HP-UX. The guide is also available on the HP Technical Documentation website:

  http://docs.hp.com/en/oshpux11iv3
- ***Configuring HP-UX for Different Languages*** — This book is provided in localized media kits. The English version of this manual is on the Instant Information DVD and the HP Technical Documentation website:

  http://docs.hp.com/en/oshpux11iv3

- ***VSE Management Software Version 4.1 Installation and Update Guide for HP-UX*** — Describes the VSE Management Software system installation instructions and post-installation steps that are required to configure the `VSEMgmt` package after installation from the OE. Please review this document before installing the optional `VSEMgmt` package in the OE. This guide is also available on the HP Technical Documentation website:

  http://docs.hp.com/en/T8671-90045/

  For more information about the `VSEMgmt` package in the OE, see the *HP-UX 11i Version 3 March 2009 Release Notes* (http://docs.hp.com/en/oshpux11iv3).

NOTE: You should also consult the *HP VSE Management Software Version 4.1 Release Notes for HP-UX* for late additions and corrections to the VSE Management Software documentation. This document is also available on the HP Technical Documentation website:

http://docs.hp.com/en/T8671-90054/

- ***HP Insight Dynamics — VSE and HP VSE Management Software 4.1 Getting Started Guide*** — Provides an overview of HP Insight Dynamics — VSE for HP ProLiant systems and the VSE Management Software for HP Integrity systems. This guide is also available on the HP Technical Documentation website:

  http://docs.hp.com/en/T8671-90036/

- ***HP Insight Dynamics — VSE and HP VSE Management Software Version 4.1 Support Matrix*** — Describes the system requirements for HP Insight Dynamics — VSE for HP ProLiant systems and the VSE Management Software for HP Integrity systems. This document is also available on the HP Technical Documentation website:

  http://docs.hp.com/en/T8671-90062/

2 System Requirements for Cold-Installing and Updating

This chapter helps you assess the current state of your system prior to cold-installing or updating to HP-UX 11i v3.

What You Will Find in This Chapter

- "System Requirements" (page 21)
- "How to Plan Your Disk Space Needs" (page 25)
- "Supported Systems" (page 26)
- "Supported Network Drivers, Mass Storage Drivers, I/O Cards, and Storage Devices" (page 26)
- "Finding Firmware Information" (page 27)
- "Identification of Model, OS/OE, and Software" (page 28)

IMPORTANT: Review the *HP-UX 11i v3 Read Before Installing or Updating* DVD booklet. It describes last-minute information that was not available when this guide was published.

System Requirements

To cold-install or update HP-UX 11i v3, you must have the following:

- A supported system. See "Supported Systems" (page 26)
- HP-UX 11i v3 OE and Application (AR) media
- 1.5 GB memory, minimum

NOTE: The minimum memory limit is intended for running the HP-UX 11i v3 Base OE and minimal applications. Additional memory will be required for optimal performance and optional software and applications.

NOTE: If your system has the minimum amount of memory, you may need to manually set VxFS tunables for optimal performance *after* cold-installing or updating to HP-UX 11i v3. For more information about these tunables, see Appendix B (page 127).

System Firmware Requirements

Make sure the firmware shipped with the system meets the minimum firmware requirements for the system for the latest HP-UX 11i v3 (B.11.31) release. HP strongly recommends you review the minimum system firmware matrix for HP-UX 11i v3 (B.11.31) systems at the HP Technical Documentation website:

http://www.docs.hp.com/en/hw.html#System%20Firmware

See also "Finding Firmware Information" (page 27).

Disk Space Requirements for a Cold-Install

The tables listed below show the amount of disk space allocated for the indicated partitions during a default cold-install for each Operating Environment. Please note that in the tables below, the results are from using the *bdf*(1M) command; your results may vary if you use the *du*(1) command. In addition, totals are not exact due to rounding.

Table 2-1 Original OEs on Itanium System

Partition	FOE	EOE	MCOE	TCOE
/	1 GB (29% used)	1 GB (30% used)	1 GB (29% used)	1 GB (29% used)
/stand	1.75 GB (11% used)	1.75 GB (11% used)	1.75 GB (10% used)	1.75 GB (10% used)
/var	8.5 GB (7% used)	8.5 GB (7% used)	4.5 GB (16% used)	4.5 GB (13% used)
/usr	4.4 GB (63% used)	4.4 GB (63% used)	4.4 GB (63% used)	4.3 GB (63% used)
/tmp	.5 GB (4% used)	.5 GB (4% used)	.5 GB (4% used)	.5 GB (4% used)
/opt	6.8 GB (56% used)	7.1 GB (57% used)	7.2 GB (57% used)	7.8 GB (59% used)
/home	112 MB (5% used)	112 MB (5% used)	104 MB (5% used)	104 MB (5% used)
/swap	1 GB	1 GB	1 GB	1 GB
Itanium EFI Boot	500 MB	500 MB	500 MB	500 MB
Itanium HP Service	400 MB	400 MB	400 MB	400 MB
Itanium Total	**25 GB**	**25 GB**	**21 GB**	**22 GB**

Table 2-2 Original OEs on PA System

Partition	FOE	EOE	MCOE	TCOE
/	1 GB (32% used)	1 GB (32% used)	1 GB (32% used)	1 GB (32% used)
/stand	1.6 GB (4% used)	1.6 GB (4% used)	1.6 GB (4% used)	1.6 GB (4% used)
/var	8.5 GB (5% used)	8.5 GB (5% used)	4.5 GB (12% used)	4.5 GB (10% used)
/usr	3 GB (66% used)	3 GB (66% used)	3.1 GB (66% used)	3 GB (66% used)
/tmp	.5 GB (4% used)	.5 GB (4% used)	.5 GB (4% used)	.5 GB (4% used)
/opt	4.5 GB (64% used)	4.75 GB (64% used)	4.7 GB (64% used)	5.1 GB (65% used)
/home	112 MB (5% used)	112 MB (5% used)	104 MB (5% used)	104 MB (5% used)
/swap	1 GB	1 GB	1 GB	1 GB
PA-RISC Boot	100 MB	100 MB	100 MB	100 MB
PA-RISC Total	**20.3 GB**	**21 GB**	**17 GB**	**17 GB**

Table 2-3 New OEs on Itanium System

Partition	BOE	DC-OE	HA-OE	VSE-OE
/	1 GB (29% used)	1 GB (30% used)	1 GB (30% used)	1 GB (30% used)
/stand	1.75 GB (11% used)	1.75 GB (10% used)	1.75 GB (10% used)	1.75 GB (11% used)
/var	8.5 GB (7% used)	4.5 GB (16% used)	4.5 GB (16% used)	8.5 GB (7% used)
/usr	4.3 GB (63% used)	4.4 GB (63% used)	4.5 GB (63% used)	4.3 GB (63% used)
/tmp	.5 GB (4% used)	.5 GB (4% used)	.5 GB (4% used)	.5 GB (4% used)
/opt	7 GB (56% used)	7.3 GB (58% used)	7.3 GB (57% used)	7.4 GB (57% used)
/home	112 MB (5% used)	104 MB (5% used)	104 MB (5% used)	112 MB (5% used)
/swap	1 GB	1 GB	1 GB	1 GB
Itanium EFI Boot	500 MB	500 MB	500 MB	500 MB
Itanium HP Service	400 MB	400 MB	400 MB	400 MB
Itanium Total	**25 GB**	**21.5 GB**	**21.5 GB**	**25.4 GB**

Table 2-4 New OEs on PA System

Partition	BOE	DC-OE	HA-OE	VSE-OE
/	1 GB (32% used)	1 GB (32% used)	1 GB (32% used)	1 GB (32% used)
/stand	1.6 GB (4% used)	1.6 GB (4% used)	1.6 GB (4% used)	1.6 GB (4% used)
/var	8.5 GB (5% used)	4.5 GB (12% used)	4.5 GB (12% used)	8.5 GB (5% used)
/usr	3 GB (66% used)	3.2 GB (66% used)	3.2 GB (66% used)	3 GB (66% used)
/tmp	.5 GB (4% used)	.5 GB (4% used)	.5 GB (4% used)	.5 GB (4% used)
/opt	4.5 GB (64% used)	4.7 GB (64% used)	4.7 GB (64% used)	4.7 GB (64% used)
/home	112 MB (5% used)	104 MB (5% used)	104 MB (5% used)	112 MB (5% used)
/swap	1 GB	1 GB	1 GB	1 GB
PA-RISC Boot	100 MB	100 MB	100 MB	100 MB
PA-RISC Total	**20.3 GB**	**16.7 GB**	**16.7 GB**	**20.5 GB**

NOTE: During installation, Ignite-UX (on the File System tab) shows a higher percentage of disk space used than the information in the tables listed above show. The minimums enforced by Ignite-UX ensure that the cold-install completes successfully without filling a file system. This difference exists on all versions of Ignite-UX.

Disk Space Requirements for an Update

To ensure a successful update to HP-UX 11i v3, make sure that you have at least as much disk space allocated to the file partitions listed in the tables above, *and* that each partition (most importantly, /usr, /opt, and /var) has at least 10-20 percent free space to allow for any growth.

Disk Space Allocation for File Partitions

Depending on your system's purpose, you may need to determine how much disk space you will need for each file partition before you cold-install or update to HP-UX 11i v3. For example, if you plan to install applications from other vendors, you may need to modify the size of the /opt partition to accommodate their size. Depending on how much disk space is available, you can change the partition size to meet your

needs. For information about modifying your file system, see the *HP-UX System Administrator's Guide* at the HP Technical Documentation website: http://docs.hp.com

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CAUTION: If the default size for the `/stand` partition is too small for your environment, do not use the `lvextend` command to increase the size of the `/stand` partition; doing so may render your system unbootable. Instead, use a Dynamic Root Disk (DRD) clone to create an inactive copy of the system on which `/stand` can be extended, or use Ignite-UX recovery to create a recovery image and resize the `/stand` partition.

To use a DRD clone to extend `/stand` on an LVM-managed system, see "Using the DRD Toolset to Extend the `/stand` File System in an LVM Environment" (http://docs.hp.com/en/5992-1913/5992-1913.pdf). Further information on DRD is available at the DRD website: http://docs.hp.com/en/DRD/.

You can boot from an Ignite-UX recovery image and resize `/stand` as you recover the system. For help creating a recovery image, refer to *Ignite-UX Administration Guide: for HP-UX 11i* available at the Ignite-UX website: http://docs.hp.com/en/IUX/.

How to Plan Your Disk Space Needs

This section provides hints and information to help you determine your disk needs for HP-UX 11i v3. If you need more disk space, be sure to order the equipment and plan on installing it after backing up your current system.

- Record the hardware path to the DVD drive.
- Develop a clear configuration plan, including:
  - File system sizes
  - Swap space size
  - Dump device
  - Disk and file system parameters
  - Mirroring information
- If installing application programs other than those supplied within an HP-UX 11i v3 Operating Environment (OE), consider the vendor's size recommendations.
- When planning disk space, refer to these documents:
  - *HP-UX System Administrator's Guide* — This guide is comprised of five volumes and is available on the Instant Information DVD and at the HP Technical Documentation website:

    http://docs.hp.com

  - *Disk and File Management Tasks on HP-UX* — Prentice-Hall Hewlett-Packard Professional Books, 1997.

Supported Systems

For a list of HP Integrity and HP 9000 systems that this release of HP-UX 11i v3 fully supports, refer to HP Server Support Matrix at the following website:

www.hp.com/go/hpuxservermatrix

NOTE: HP-UX 11i v3 is not supported on workstations. HP recommends that PA-RISC workstation users use HP-UX 11i v1, and Itanium®-based workstation users use HP-UX 11i v2. Further information about HP workstations can be found at the following website:

http://hp.com/go/workstations.

Additional hardware documentation can be found at the following website:

- Enterprise Servers, Workstations, and Systems Hardware:

  http://www.docs.hp.com/en/hw.html

Additional information regarding HP servers can be found at the following websites:

- HP BladeSystem: http://www.hp.com/go/blades
- HP Integrity Server Family: http://www.hp.com/go/integrity
- HP 9000 Server Family: http://www.hp.com/go/hp9000

Supported Network Drivers, Mass Storage Drivers, I/O Cards, and Storage Devices

Before installing HP-UX 11i v3, make sure that the drivers, I/O cards, and storage devices on your system are supported.

You can run the `msv2v3check` script to validate whether the drivers, mass storage I/O cards, and mass storage devices installed on your system are supported on HP-UX 11i v3. This script will report if any unsupported drivers, mass storage I/O cards, and mass storage devices are found on your system.

This script will also check the minimum firmware versions required for these cards or devices on your system to run properly on HP-UX 11i v3. You can retrieve the `msv2v3check` script from the HP software depot at

http://www.hp.com/go/softwaredepot

For a list of supported and unsupported HP-UX I/O cards and mass storage devices, refer to the *HP-UX Supported I/O Cards Matrix* and the *HP-UX Supported Mass Storage Devices Matrix* at the HP Technical Documentation website:

http://docs.hp.com

For more details on the `msv2v3check` script, refer to the white paper called, *HP-UX 11i v2 to 11i v3 Mass Storage Stack Update Guide* available at

http://docs.hp.com/en/netsys.html#Storage%20Area%20Management

HP StorageWorks Compatibility with HP-UX 11i v3

For up-to-date status and recommended firmware versions for HP StorageWorks components supported with HP-UX 11i v3, please refer to the HP-UX 11i v3 and HP StorageWorks Compatibility section at

http://h18006.www1.hp.com/storage/hpuxconnectivitymatrix.html

Third Party (non-HP) Storage Compatibility with HP-UX 11i v3

For an up-to-date list of third-party storage devices which have completed interoperability validation under the guidance of HP and have been qualified as interoperable with HP-UX 11i v3, please refer to the following website:

http://www.hp.com/products1/serverconnectivity/mass_storage_devices.html

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⚠ **WARNING!** If third-party (non-HP) storage will be connected to your HP-UX 11i v3 system, HP recommends that you contact your third-party storage vendor to determine the compatibility of the storage with HP-UX 11i v3. Check with your third-party storage vendor for information about any prerequisites and limitations with the storage on HP-UX 11i v3.

Finding Firmware Information

HP recommends that you sign-up for Subscriber's Choice so you can automatically receive email notices for the latest firmware updates. Make sure you register all your products to receive the appropriate firmware update notices.

You can also go to the Business Support Center website at http://www.hp.com/go/bizsupport for the latest HP-UX 11i firmware updates. The IT Resource Center (ITRC) website at http://itrc.hp.com also provides a link to the Business Support Center.

To obtain the system firmware files, installation instructions, and release notes with detailed firmware version information select **Download Drivers** and **Software** at http://www.hp.com/go/bizsupport

This site provides a searchable database for various products or you can follow the **Server** link to select the latest firmware download for your specific server product.

Make sure you read the Release Notes for the firmware to ensure a successful update. In general, HP recommends that you update to the latest firmware available before installing or updating to HP-UX 11i v3.

For a matrix of system firmware for I/O adapters with HP-UX 11i v3 boot support, as well as the minimum system firmware requirements for HP-UX 11i v3, refer to the documents at http://docs.hp.com/en/hw.html#System%20Firmware

Identification of Model, OS/OE, and Software

Before you cold-install or update to HP-UX 11i v3, you need to identify the model of your system and other information.

Identifying the Model

To determine the model number of your system, enter:

```
model
```

To verify that HP-UX 11i v3 is supported on your system, see "Supported Systems" (page 26).

For Itanium-based systems, you can identify the model by using the Extensible Firmware Interface (EFI): interrupt the autoboot process in the boot manager, enter the EFI shell, and use the `info sys` command:

```
Shell> info sys
```

Information about the model is displayed. For example:

```
SYSTEM INFORMATION
Product Name: server rx2600
Serial Number: sg20220034
UUID: FFFFFFFF-FFFF-FFFF-FFFF-FFFFFFFFFFFF
```

Identifying the OS

To identify the OS version that your system is currently running, enter:

```
uname -r
```

When a system has HP-UX 11i installed, you can determine which revision (Release ID) is installed by entering the following command:

```
/usr/sbin/swlist -l bundle | fgrep HPUX11i-OE
```

The `HPUX11i-OE` bundle indicates the current installed revision level. The revision level is indicated both in the bundle version number and in the description text.

Identifying the OE

To identify the Operating Environment currently installed on your system, use `swlist`. For example:

```
/usr/sbin/swlist -l bundle HPUX11i-*
```

The output of this command includes a line that identifies the installed OE. For example:

```
HPUX11i-OE B.11.31 HP-UX 11i Base Operating Environment
```

Identifying Installed Software

To identify the software products on a system or media, use `swlist`. For example, to show revision and descriptive title of all software installed on a system, enter:

`/usr/sbin/swlist`

To list all products and their versions on a DVD mounted at `/dvdrom`, enter:

`/usr/sbin/swlist -s /dvdrom`

To get a table of contents and product details, enter:

`/usr/sbin/swlist -dvl product -a readme @ /dvdrom`

The `swlist` command has many options to expand or narrow the listing to specific attributes. Refer to the *swlist*(1M) manpage or the *Software Distributor Administration Guide*, available on the Instant Information DVD and at the HP Technical Documentation website:

http://docs.hp.com/en/oshpux11iv3.html

3 Choosing an Installation Method

This chapter provides information and scenarios to help you choose the most appropriate method to install HP-UX 11i v3 on your system.

What You Will Find in This Chapter

- "Cold-Installs of HP-UX 11i v3" (page 31)
- "Supported Update Paths to HP-UX 11i v3" (page 32)
- "Deciding Which Method to Use" (page 33)
- "Mass Storage Stack for HP-UX 11i v3" (page 36)
- "Security Considerations" (page 37)
- "Online Diagnostics" (page 45)
- "Offline Diagnostics" (page 46)

Cold-Installs of HP-UX 11i v3

NOTE: If you have ordered a new system with the Instant Ignition option (also known as factory integrated), the cold-installation process described here has already been performed. Skip this chapter and proceed to installing applications in Chapter 7: "Installing HP Applications and Patches" (page 97).

IMPORTANT: Make sure you review the *HP-UX 11i v3 Read Before Installing or Updating* DVD booklet for situations not discussed here that may apply to your system.

Cold-install means installing system software on a new (uninstalled) or existing system by completely rebuilding the root volume group, erasing the existing operating system and data on that volume, and installing the new operating system and specified software and data.

You can choose two different methods to cold-install HP-UX 11i v3 on a supported system: 1) by direct installation from the DVD media; 2) by creating depots on servers using SD-UX or Ignite-UX and installing it over the network.

An advantage of cold-install is that supported software can be installed without regard for the software currently on the system, or concern for cleaning up old software.

Supported versions of HP-UX that can be configured as Ignite-UX servers include HP-UX 11i v1, HP-UX 11i v2, and HP-UX 11i v3. Ignite-UX servers installed on any of these HP-UX systems can be configured to cold-install HP-UX 11i v3.

Supported Update Paths to HP-UX 11i v3

Update means using `update-ux` to selectively overwrite the operating system and application software from a media or network source depot.

An advantage of performing an update is that it leaves user data, configuration, and applications in place.

You can update to HP-UX 11i v3 from HP-UX 11i v2 (B.11.23). Updating from any other release directly to HP-UX 11i v3 is not supported.

NOTE: Updating from HP-UX 11i v1 to HP-UX 11i v3 is not supported. You must first update to an HP-UX 11i v2 Operating Environment. Please see the *HP-UX 11i v2 Installation and Update Guide* for information on how to update from HP-UX 11i v1 to HP-UX 11i v2.

Update Path Notes

- You cannot downgrade to a lower level Operating Environment. See Table 3-1 (page 33) for supported update paths.
- You cannot update between server Operating Environments and technical Operating Environments.
- Updating from a release of HP-UX to another release of HP-UX that was released earlier in time is not supported. For example, trying to update from HP-UX 11i v2 June 2007 release to the HP-UX 11i v3 February 2007 release is not supported. This could cause system incompatibilities and unpredictable results. If you attempt to update to an earlier version of HP-UX, the update process will stop without making any changes to your system and you will get the following error message:

```
ERROR: You are attempting to update from your release of HP-UX to a version of HP-UX that
was released earlier in time.  This is not supported.  The update process has stopped
without making any changes to your system.  Please see the 'Supported Update Paths'
section of the HP-UX 11i v3 Installation and Update Guide for more information.
```

Supported Update Paths

Table 3-1 lists the supported update paths from HP-UX 11i v2 to HP-UX 11i v3 and from the original OEs to the new OEs.

Table 3-1 Update Paths HP-UX 11i v2 to HP-UX 11i v3

OS/OE	HP-UX 11i v3 BOE	HP-UX 11i v3 HA-OE	HP-UX 11i v3 VSE-OE	HP-UX 11i v3 DC-OE
HP-UX 11i v2 FOE	x	x	x	x
HP-UX 11i v2 EOE			x	x
HP-UX 11i v2 MCOE				x
HP-UX 11i v2 TCOE	x			
HP-UX 11i v3 FOE	x	x	x	x
HP-UX 11i v3 EOE			x	x
HP-UX 11i v3 MCOE				x
HP-UX 11i v3 TCOE	x			
HP-UX 11i v3 BOE	x	x	x	x
HP-UX 11i v3 HA-OE		x		x
HP-UX 11i v3 VSE-OE			x	x
HP-UX 11i v3 DC-OE				x

Deciding Which Method to Use

Now that you have evaluated your system and ordered any needed hardware, you need to decide whether to cold-install or update to HP-UX 11i v3 on your system.

When to Cold-Install

CAUTION: The cold-install process erases software on the root volume before installing. If you want to retain any existing software, make sure to back up that software before migrating or use update. **Cold-installing using Ignite-UX overwrites everything on the target volume**.

You can cold-install rather than update to HP-UX 11i v3 when:

- You have a new system.
- You are managing several systems with similar OS configurations.
- Your disk space needs reconfiguration. See "How to Plan Your Disk Space Needs" (page 25).

- Your systems are organized with clean separation of the OS from user, application, and data files.
- Overwriting the root (/) volume on existing systems will not cause a loss of applications or data.
- Your system configuration is not listed as a supported update path. See "Supported Update Paths to HP-UX 11i v3" (page 32).

You can cold-install from *any supported* configuration. See "Supported Systems" (page 26).

The process described in this guide cold-installs a single system from local media. If you plan to install many systems simultaneously, use an Ignite-UX server. Additional information on Ignite-UX and newer versions are available at http://docs.hp.com/en/IUX/

See Chapter 4: "Preparing to Cold-Install or Update to HP-UX 11i v3" (page 47) for more information about preparing your system for cold-install and then read the cold-install process using Ignite-UX in Chapter 5: "Cold-Installing HP-UX 11i v3 From Media" (page 61).

When to Update

You can update rather than cold-install HP-UX 11i v3 when:

- You are updating from a supported HP-UX 11i v2 or HP-UX 11i v3 system. See "Supported Update Paths to HP-UX 11i v3" (page 32) for specific details.
- You are concerned about recovering unique applications and data on your root volume, and do not want to write over non-OS files, which occurs when cold-installing HP-UX 11i v3.
- Each system has a unique configuration.
- Current disk space is sufficient for HP-UX 11i v3. See "How to Plan Your Disk Space Needs" (page 25).

You can choose two different methods to update to HP-UX 11i v3 on a supported system: 1) by the using the `update-ux` terminal user interface; 2) by using the `update-ux` command line interface.

An advantage of performing an update is that it leaves user data, configuration, and applications in place. Updating to HP-UX 11i v3 is limited to the supported paths listed in "Supported Update Paths to HP-UX 11i v3" (page 32).

See Chapter 4: "Preparing to Cold-Install or Update to HP-UX 11i v3" (page 47) for details on how to prepare your system to update to HP-UX 11i v3. The update process is described in Chapter 6: "Updating to HP-UX 11i v3" (page 77).

What Software Source to Use

When cold-installing or updating your systems, you can choose to update using media, copy the contents of media into network depots, or create a golden image of the desired

system for installing many similar systems. The process described in this guide cold-installs and updates a single system from local media.

- **If you are cold-installing or updating one system at a time** — Cold-install or update directly from the DVDs in the HP-UX 11i v3 media kit:
  - **HP-UX 11i v3 OE media** — Boot and install a new system or update an existing system.
  - **HP-UX Application media**— Install applications not installed with the OE or install a newer version of an OE application.
- **If you plan to cold-install or update on many systems in your enterprise** — You can consolidate your software sources in a network depot:
  - **Network Depot** — Use Software Distributor (SD) commands to create depots containing OS, OE, and other software bundles, then install or update from the depot using Ignite-UX or `update-ux`. For help with this method, refer to the `swcopy`(1M) manpage, the *Software Distributor Administration Guide* (http://docs.hp.com/en/SD/index.html), and the *Ignite-UX Administration Guide* (http://docs.hp.com/en/oshpux11iv3.html#Ignite-UX).
- **If you plan to create many similar systems in your enterprise** — You can use an Ignite-UX server to create a faster software source than an SD depot:
  - **Golden Image** — Create a golden image from which to cold-install. A golden image is a snapshot of a known, good operating system installation and configuration for use in installing other clients. The copied (source) client is called the golden image. This install image can contain the OS and OE, other applications, and any needed patches. After the archive is in place, either on the Ignite-UX server or on another system, you can cold-install on each client system in a single-pass operation; you need to reboot each client only once. Please refer to the *Ignite-UX Administration Guide* (http://docs.hp.com/en/oshpux11iv3.html#Ignite-UX) for more information on golden images.

Managing a Network Depot with Patch Bundles

You must use the updated Ignite-UX and Update-UX tools from September 2007 OE Update release (or later) to correctly install patches and HP-UX 11i v3 patch bundles. HP supports the following cold-install or update cases with a network depot that includes HP-UX patches or patch bundles.

To cold-install HP-UX 11i v3 using a network depot, use any release of HP-UX 11i v3 to create the network depot, and then copy the desired patch bundles into that depot. Use Ignite-UX version C.7.3 (or later) to cold-install HP-UX 11i v3. Get the latest Ignite-UX version from the IUX Download page: http://docs.hp.com/en/IUX/download.html

To update to the latest release of HP-UX 11i v3, start with the desired HP-UX 11i v3 OE bundles from the September 2007 release (or later) to create the depot, and then copy the desired patch bundles into the depot. Updates to a network depot with the

HP-UX 11i v3 OE bundles from February 2007 and 11i v3 patch bundles from September 2007 release or later cannot be supported, due to known problems with the initial release of 11.31 HP-UX software management tools (that get installed with OE bundles from February 2007).

Mass Storage Stack for HP-UX 11i v3

HP-UX 11i v3 introduces a new representation of mass storage devices, known as the agile view. In the agile view, disk devices and tape drives are identified by the actual object, not by a hardware path to the object. In addition, paths to the device can change dynamically and multiple paths to a single device can be transparently treated as a single virtualized path, with I/O being distributed across those multiple paths.

This representation increases the reliability, adaptability, performance, and scalability of the mass storage stack, without the need for operator intervention.

HP-UX 11i v3 Hardware Paths

In HP-UX 11i v3, there are three different types of paths to a device: legacy hardware path, lunpath hardware path, and LUN hardware path. All three are numeric strings of hardware components, with each number typically representing the location of a hardware component on the path to the device. These paths are described below.

- Legacy hardware path

  The legacy hardware path is the format used in releases prior to HP-UX 11i v3, and is displayed in the legacy view. It is composed of a series of bus-nexus addresses separated by '/' leading to the host bus adapter (HBA); beyond the HBA, additional address elements are separated by '.'.

- Lunpath hardware path

  The lunpath format enables the use of more targets and LUNs than are permitted under legacy hardware paths, and is printed in the agile view. It is identical in format to a legacy hardware path, up to the HBA (and represents the same path to the LUN). Beyond the HBA, additional elements are printed in hexadecimal.

- LUN hardware path

  The LUN format is a virtualized path that represents all the lunpaths to a single LUN. It is printed in the agile view. Instead of a series of bus-nexus addresses leading to the HBA, the path contains a virtual bus-nexus (referred as the virtual root node) with an address of 64000. An example of a LUN hardware path is "64000/0xfa00/0x22".

HP-UX 11i v3 Device Special File (DSF)

In a similar way to hardware paths, there are two types of DSFs for mass storage: legacy DSFs and persistent DSFs. Both can be used to access a given mass storage device independently, and can coexist on a given system. These DSFs are described below.

- A legacy device special file was the only type of mass storage DSF in releases prior to HP-UX 11i v3, so it is associated with the legacy view. It is locked to a particular physical hardware path, or lunpath, and does not support agile addressing. Each lunpath requires a different DSF, so a multi-pathed LUN has multiple DSFs, one for each lunpath.
- A persistent device special file is associated with a LUN hardware path, and is seen in the agile view. Because it is based on the LUN hardware path, rather than the lunpath, it transparently supports agile addressing and multipathing. Like the LUN hardware path, the binding of device special file to device persists across reboots, but is not guaranteed to persist across installations.

Device Files: Installing and Updating

If you cold-install HP-UX 11i v3, both legacy and persistent DSFs are automatically created. By default, the installation process will configure system devices like the boot, root, swap, and dump devices to use persistent DSFs. This means that configuration files such as `/etc/fstab`, `/etc/lvmtab`, and others will contain references to persistent DSFs.

If you update from HP-UX 11i v2 to 11i v3, existing legacy DSFs are retained, and persistent DSFs will be created.

In addition, legacy DSFs are completely backward compatible, and will not be affected by any persistent DSFs on the same server. A device can be simultaneously accessed via legacy and persistent DSFs. For more information on the new mass storage stack, see the white paper called, *The Next Generation Mass Storage Stack: HP-UX 11i v3* at

http://docs.hp.com/en/MassStorageStack/The_Next_Generation_Mass_Storage_Stack.pdf

Security Considerations

HP-UX Bastille (`HPUXBastille`) is included as recommended software on the Operating Environment media and can be installed and run with Ignite-UX or Update-UX, (see "Predefined Security Levels" (page 38)).

HP-UX Bastille is a security hardening and lockdown tool that can be used to enhance security of the HP-UX operating system. It provides customized lockdown on a system-by-system basis by encoding functionality similar to Bastion Host and other hardening and lockdown checklists.

NOTE: For more information about HP-UX Bastille, refer to the *HP-UX 11i v3 Release Notes* and the *HP-UX System Administrator's Guide*.

Predefined Security Levels

At cold-install or update-time, you can choose one of the security levels listed in Table 3-2, with each one providing incrementally higher security.

Table 3-2 Predefined Security Configuration

Security Level	Configuration File Name[1]	Description
`Sec00Tools`[2]	Not applicable	The install-time security infrastructure; no security changes.
`Sec10Host`[3]	`HOST.config`	Host-based lockdown: firewall pre-enablement; some common clear-text services turned off, excluding Telnet and FTP.
`Sec20MngDMZ`[3]	`MANDMZ.config`	Lockdown while allowing secure management: IPFilter firewall blocks incoming connections except common, relatively safe, management protocols.
`Sec30DMZ`[3]	`DMZ.config`	Network-DMZ Lockdown: IPFilter blocks all incoming connections except HP-UX Secure Shell.

1 Configuration files are installed to `/etc/opt/sec_mgmt/bastille/configs/defaults`

2 `Sec00Tools` is installed by default.

3 `Sec10Host`, `Sec20MngDMZ`, and `Sec30DMZ` are selectable.

NOTE: When you select either the `Sec30DMZ`, or `MngDMZ` security level, IPFilter will restrict inbound network connections. For more information on how to add inbound ports to your `/etc/opt/ipf.customerrules` file, refer to the *HP-UX IPFilter (Version A.03.05.09 and later) Administrator's Guide* and the *HP-UX System Administrator's Guide*.

Selecting Your Security Levels at Install Time

During installation, you can configure your security levels by navigating to the **System** tab from the Ignite-UX Graphical User Interface Installation and Configuration dialog box. The System tab allows you to configure information unique to your system such as security levels, hostname, IP address, root password, and the time zone.

For ease of use, HP recommends using the **System** tab to select the security level appropriate for your deployment as described below.

1. Do one of the following:
   - If you are using the Ignite-UX GUI, navigate to the **System** tab (from the Ignite-UX Installation and Configuration dialog box) and select **Security Choices**.
   - If you are using the Ignite **Install HP-UX Wizard**, navigate to the **Additional Software** screen and select Security Choices.

The four security levels appear. By default, `Sec00Tools` is selected.

2. Select the security level appropriate for your deployment. See "Predefined Security Levels" (page 38) for more information.
3. Select **OK**.

Serviceguard Configuration (Post-Installation) to Enable Use with Security Levels

NOTE: For the most complete information on configuring Bastille with Serviceguard, see the appropriate version of the *HP Serviceguard Release Notes* at http://www.docs.hp.com/en/ha.html#Serviceguard.

Configuring Sec20MngDMZ or Sec30DMZ for Use with Serviceguard

Serviceguard uses dynamic ports. To enable operation, the possible-SG port range must be opened. Opening the port range is not consistent with the security goals of `Sec20MngDMZ` (`MANDMZ.config`) and `Sec30DMZ` (`DMZ.config`) since multiple services (including other rpc-like applications), may also listen to this same port range. The firewall, however, will still provide security benefits consistent with the Serviceguard security deployment model as described in the *Securing Serviceguard* document at

http://docs.hp.com/

Before you open the Serviceguard port range make sure you review the required IPFilter-SG rules, which are documented in the *HP-UX IPFilter (Version A.03.05.09 and later) Administrator's Guide* at

http://docs.hp.com/en/B9901-90031

Serviceguard requires one additional service, `identd`. Enable it by following the steps below.

1. Edit the HP-UX Bastille `/etc/opt/sec_mgmt/bastille/config` configuration file by changing the answer to the question:

   ```
   Should Bastille ensure inetd's ident service does not run on
   this system?
   ```

2. Change the answer from Y to N as follows:

   ```
   SecureInetd.deactivate_ident="N"
   ```

3. Apply the configuration file changes. You can update your system configuration manually or use HP-UX Bastille to update your system configuration. The former will require fewer steps on systems that have been manually configured, after a user has configured the system using the Bastille tool, and the latter will require

fewer steps on systems that had not been manually configured, after a user has configured the system using the Bastille tool.

4. Do one of the following:
   - Manually update the system configuration: Edit the `/etc/inetd.conf` file by uncommenting (remove the #) the following line:

     ```
     #auth stream tcp6 wait bin /usr/lbin/identd identd
     ```

     Force `inetd` to reread the configuration by running the following command:

     ```
     # inetd -c
     ```

   - Use HP-UX Bastille to update the configuration: Revert to the previous HP-UX Bastille configuration; then apply the new HP-UX Bastille configuration.

     ```
     # bastille -r
     # bastille -b
     ```

Configuring HP-UX Bastille Sec10Host

To configure the HP-UX Bastille Sec10 Host, refer to the *Securing Serviceguard* document at

http://docs.hp.com/

△ **CAUTION:** When reverting to the configuration prior to the use of HP-UX Bastille, note these precautions:

- Security configuration changes will be undone temporarily.
- Other manual configuration changes or additional software installed since HP-UX Bastille was initially run may result in HP-UX Bastille requiring a manual merge of configuration settings.
- Refer to the Bastille question text in the *HP-UX System Administrator's Guide* or in the Bastille GUI for detail on the precise interactions.

Security Choice Dependencies

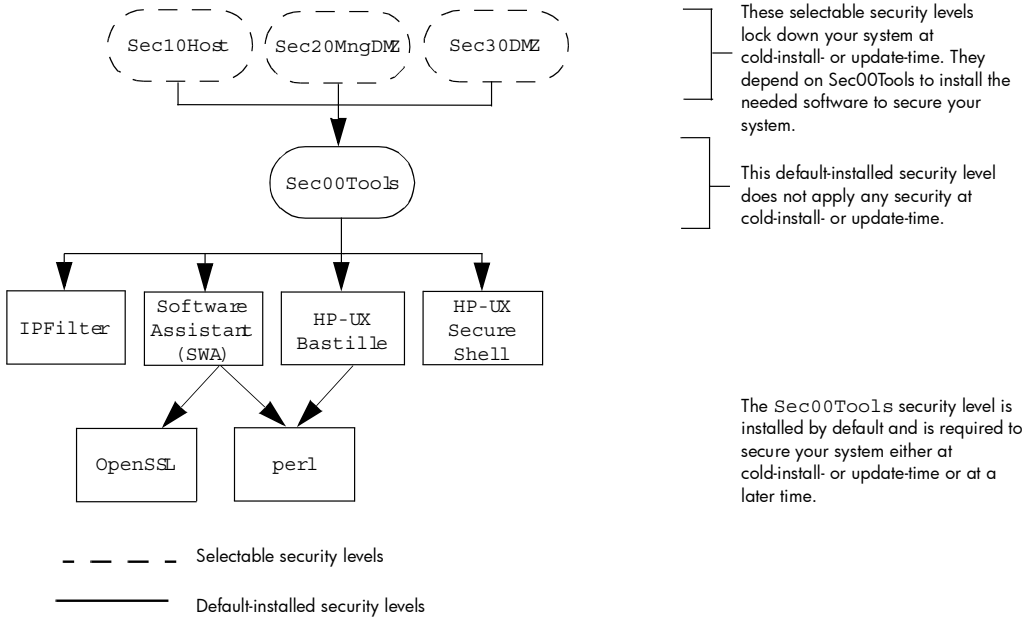
The `Sec00Tools` security level is installed by default on your system. Although `Sec00Tools` does not implement any security changes at cold-install- or update-time, it does ensure that the required software (Figure 3-1) is installed. The `Sec00Tools` security level contains the pre-built configuration files that you can use to create a security level or you can use it as a template to create a custom security configuration. The `Sec00Tools` security level also ensures that the software needed by those security levels is present.

Alternately, you can lock down your system using one of the following selectable security levels at cold-install- or update-time:

- Sec10Host
- Sec20MngDMZ
- Sec30DMZ

Sec10Host, Sec20MngDMZ, and Sec30DMZ are dependent on Sec00Tools.

Figure 3-1 Install-time Security Software Dependencies



Secured Services and Protocols

Each security level provides incrementally higher security by locking down various protocols and services. HP-UX Bastille uses a series of questions to determine which services and protocols to secure. Using one of the security levels applies a default security profile, simplifying the lockdown process.

The following tables detail the services and protocols affected by the security levels, listed in Table 3-2 (page 38), if you choose to apply one at cold-install- or update-time:

- Table 3-3 (page 42) lists the security settings for Sec10Host. These settings also apply to Sec20MngDMZ and Sec30DMZ.
- Table 3-4 (page 44) lists the security settings applied with Sec20MngDMZ, in *addition* to the settings in Table 3-3.
- Table 3-5 (page 45) lists the security settings applied with Sec30DMZ, in *addition* to the settings in Table 3-3 and Table 3-4.

IMPORTANT: Review these tables carefully. Some of the locked down services and protocols may be used by other applications, and *may* have adverse effects on the behavior or functionality of these applications. For example, HP Systems Insight Manager and Partition Manager rely on WBEM to communicate between hosts; `Sec30DMZ` blocks all incoming WBEM connections via IPFilter, though local and outbound communication is not blocked. In addition, some third-party installation scripts may not correctly handle the more conservative `umask` value of 027 set by the security levels.

You can change the security settings configured at cold-install- or update-time by running HP-UX Bastille after installing or updating your system. For more information about using HP-UX Bastille, refer to *HP-UX System Administrator's Guide* or the *HP-UX Bastille User's Guide* located on your system: `/opt/sec_mgmt/bastille/docs/user_guide.txt`

Table 3-3 Host-based `Sec10Host` Install-time Security Settings[1]

Category	Actions
Logins and Passwords	Deny login unless home directory exists Deny non-root logins if `/etc/nologin` file exists Set a default path for `su` command Disable root logins from network `tty` Hide encrypted passwords Disallow `ftpd` system account logins Disable remote X logins Restrict the use of `at to` administrative accounts Disable login access to the system accounts Lock the local accounts with no password Restrict the home directory permissions Remove the dot from the root path Remove world-write permission from local user account dot files Delete `.shosts`, `.rhosts`, and `.netrc` from the local user accounts Set `mesg n` for all users Disable the local graphical login
File System, Network, and Kernel	Modify `ndd` settings [2,3] Restrict remote access to `swlist` Set default `umask` Enable kernel-based stack execute protection Disable all serial ports besides the console Assign unowned files to the `bin` user Make TCP ISN RFC 1948 compliant Disable the "nobody" user in the ONC Secure RPC

Table 3-3 Host-based `Sec10Host` Install-time Security Settings *(continued)*

Category	Actions
Daemons	Disable `ptydaemon` Disable `pwgrd` Disable `rbootd` Disable CIFS Server Disable CIFS Client Disable NFS client daemons Disable NFS server Disable NIS client programs Disable NIS server programs Disable NIS+ server programs Disable `SNMPD`
inetd Services	Deactivate `bootp` Deactivate `inetd`'s built-in services Deactivate CDE helper services Deactivate `finger` Deactivate `ident` Deactivate `klogin` and `kshell` Deactivate `ntalk` Deactivate `login`, `shell`, and `exec` services Deactivate `swat` Deactivate `printer` Deactivate `recserv` Deactivate `tftp` Deactivate `time` Deactivate `uucp` Deactivate `rquotad` Deactivates Event Monitoring Services (EMS) network communication Enable logging for all `inetd` connections
sendmail	Run `sendmail` via `cron` to process queue Stop `sendmail` from running in daemon mode Disable `vrfy` and `expn` commands
Other Settings	Deactivate HP Apache 2.x Web Server[4] Set up `cron` job to run Software Assistant[2] Ensure the `crontab` files are only accessible by root Restrict the use of `cron` to administrative accounts Configure the HP-UX Secure Shell daemon to use generally-accepted defaults

1 Security settings listed here also apply to Sec20MngDMZ and Sec30DMZ
2 Manual action may be required to complete configuration. Refer to /etc/opt/sec_mgmt/bastille/TODO.txt for more information, after install or update.
3 The following ndd changes will be made:

```
ip_forward_directed_broadcasts=0
ip_forward_src_routed=0
ip_forwarding=0
ip_ire_gw_probe=0
ip_pmtu_strategy=1
ip_respond_to_echo_broadcast= 0
ip_send_redirects= 0
ip_send_source_quench=0
tcp_conn_request_max=4096
tcp_syn_rcvd_max=1000
arp_cleanup_interval= 60000
ip_respond_to_timestamp= 0
ip_respond_to_timestamp_broadcast= 0
tcp_isn_passphrase= <set>
```

4 Settings applied only if software is installed

Table 3-4 Additional Sec20MngDMZ Install-time Security Settings[1]

Category	Actions
inetd Services	Includes all disabled inetdservices in Table 3-3 and: Deactivate ftp Deactivate telnet Restrict syslog daemon to local connections
IPFilter Configuration[2]	Block incoming DNS query connections Block incoming HIDS administration connections[3,4] Configure IPFilter to allow outbound traffic, block incoming traffic with IP options set, and all other traffic except for HP-UX Secure Shell, HIDS agent, WBEM, web admin and web admin autostart[5], ICMP echo.
Other Settings	Disable printing

1 Applies all security configuration settings in Table 3-3
2 Additional IPFilter rules may be applied via a custom rules file located at /etc/opt/sec_mgmt/bastille/ipf.customrules
3 HP-UX Host IDS is a selectable software bundle and only available for commercial servers
4 Settings applied only if software is installed
5 Manual action may be required to complete configuration. Refer to /var/opt/sec_mgmt/bastille/TODO.txt for more information, after install or update.

Table 3-5 Additional `Sec30DMZ` Install-time Security Settings[1]

Category	Actions
IPFilter Configuration[2]	Includes all IPFilter settings in Table 3-4 and: Block incoming HIDS agent connections[3,4] Block incoming WBEM connections[5] Block incoming web admin connections Block incoming web admin autostart connections Block all traffic except HP-UX Secure Shell Block ICMP echo

1 Applies all security configuration settings in Table 3-3 and Table 3-4

2 Additional IPFilter rules may be applied via a custom rules file located at `/etc/opt/sec_mgmt/bastille/ipf.customrules`

3 Settings applied only if software is installed

4 HP-UX Host IDS is a selectable software bundle and only available for commercial servers

5 WBEM is required for several HP management applications including HP Systems Insight Manager and Partition Manager

Online Diagnostics

The diagnostics software, which is always-installed with HP-UX 11i v3, consists of two product bundles:

- `OnlineDiag` (Online Diagnostics)
- `SysFaultMgmt` (System Fault Management [SFM])

These bundles include many tools to help verify, troubleshoot, and monitor PA-RISC and Itanium-based system hardware such as processors, memory, power supplies, fans, interface cards, and mass storage devices. For more information about these products, see the following documents at http://docs.hp.com/en/diag.html:

- *Online Diagnostics (EMS and STM) Administrator's Guide*
- *Administrator's and User's Guide for SFM*

△ **CAUTION:** Removing the `OnlineDiag` bundle or the `SysFaultMgmt` bundle, or both, prevents products with dependencies on the diagnostics from functioning correctly. If the `OnlineDiag` bundle or the `SysFaultMgmt` bundle are not installed, protections from some hardware failures are removed, and it is much harder to troubleshoot and fix problems when a hardware failure occurs. The `OnlineDiag` and `SysFaultMgmt` bundles are always-installed with any HP-UX 11i Operating Environment.

Starting with the HP-UX 11i v3 March 2008 release, upon a successful OE upgrade, SFM is the default monitoring system for monitoring the core hardware components. Certain EMS Hardware Monitors (in the `OnlineDiag` bundle) are replaced by `SFMIndicationProvider` and are shut down as soon as an OE upgrade is initiated.

Upon the successful completion of the OE upgrade, SFM is the default monitoring system. However, STM, which is included in the `OnlineDiag` bundle, restarts and continues to function properly.

Although `SFMIndicationProvider` replaces certain EMS Hardware Monitors, you can continue to receive all the events from the remaining EMS Hardware Monitors through the EMS framework. Indications generated by the `SFMIndicationProvider` can be directed to the EMS framework through the WBEM Wrapper Monitor. For information on the monitors that the `SFMIndicationProvider` replaces, and for instructions on how to switch to the EMS monitoring mode, see the *SFM Release Notes* available at http://docs.hp.com/en/diag.html.

Offline Diagnostics

Offline Diagnostic Environment (ODE) includes a set of offline support tools that enables you to troubleshoot a system that is running without an operating system.

ODE is available on the following media:

- HP Itanium-Processor Family (IPF) Offline Diagnostics and Utilities CD, for Itanium-based systems.
- HP 9000 PA-RISC Offline Diagnostics CD, for PA-RISC systems.

HP highly recommends that you get the latest CD and update the Offline Diagnostics for improved functionality. Note that the CD-ROMs are OS independent and ordered separately from each other and of any operating system media.

You can order for the latest CD-ROM for your PA-RISC or Itanium-based systems from one of the following websites:

- Software Depot:

  http://www.hp.com/go/softwaredepot

- Biz Support for Itanium-based systems:

  http://www.hp.com/support/Itaniumservers

- Biz Support for HP 9000 systems:

  http://h20000.www2.hp.com/bizsupport/TechSupport/Product.jsp?lang=en&cc=us&prodTypeId=15351&prodCatId=321931

For more information on ODE, refer to the Offline Diagnostics section on the following website:

http://docs.hp.com/en/diag.html

4 Preparing to Cold-Install or Update to HP-UX 11i v3

This chapter details the preparation tasks required to cold-install or update to HP-UX 11i v3.

What You Will Find in This Chapter

- "Cold-Install Tasks" (page 47)
- "Update Tasks" (page 54)
- "Backing Up Your System" (page 56)
- "Locating Source Media and Codewords" (page 59)
- "The Next Step" (page 60)

Cold-Install Tasks

Prior to cold-installing HP-UX 11i v3, perform these tasks:

- Select an HP-UX Console (Itanium-based systems only), if appropriate.
- Back up any configuration files you want to reinstall.
- Make a recovery image of your system.
- If you intend to use Ignite-UX to cold-install HP-UX 11i v3 on more than one system, update your Ignite-UX server. For more information, refer to the *Ignite-UX Administration Guide* (http://docs.hp.com/en/oshpux11iv3.html#Ignite-UX).
- Locate source media and codewords.

Task 1: Selecting Your HP-UX Console for Itanium-based Systems

NOTE: This section does not apply to PA-RISC systems. If you are cold-installing on a PA-RISC system, you can skip this section and proceed to "Task 2: Backing Up Your Configuration Files" (page 52).

If you are using an Itanium-based system, HP-UX requires that you select the correct console via a console selection menu or EFI. (If you are already on the system console, then you can skip this section.) Even if you have ordered a machine with HP-UX pre-installed, you will want to choose your console, despite the factory defaults.

If you are cold-installing HP-UX or changing your system configuration, you will need to select the correct console. Skipping this step can result in HP-UX using an unexpected device as a console, which can appear as a system hang.

Depending on the firmware level of your Integrity server, you can select your primary HP-UX console using one the following methods:

- The EFI `conconfig` command (if present)
- The EFI Boot Manager

IMPORTANT: Do not select more than one console device. HP-UX 11i v3 recognizes only one device at a time. Choosing more than one device can result in the appearance of a system hang.

Determining if the conconfig Command Exists on your System

1. At the EFI prompt type the following command:

   ```
   Shell> conconfig
   ```

   - If the command exists, the system may return output similar to the following:

     ```
     CONSOLE CONFIGURATION
     Index  Primary  Type     Device Path
     1      P        Serial   Acpi(HWP0002,PNP0A03,0)/Pci(1|2)
     2      S        VGA      Acpi(HWP0002,PNP0A03,0)/Pci(4|0)
     ```

     NOTE: The above is an example of factory defaults. As you will see later in these steps, one of these devices will have to be configured as "primary" (**P**); the other will have to be configured with a status of "Not Configured" (**NC**).

   - If the command does not exist, the system will return the error message:

     `conconfig not found.`

2. Depending on whether the `conconfig` command exists on your system, use either the `conconfig` command or the EFI Boot Manager to select your primary HP-UX console.

Using the conconfig Command to Select the Primary HP-UX Console

1. Enter `conconfig` at the command line. You may see output similar to the following:

```
CONSOLE CONFIGURATION
Index  Primary  Type     Device Path
1      P        Serial   Acpi(HWP0002,PNP0A03,0)/Pci(1|2)
2      NC       VGA      Acpi(HWP0002,PNP0A03,0)/Pci(4|0)
```

2. Decide which console you want to use.

   Depending on your system configuration, HP-UX can use one of the following devices as your system console:

   - System Serial Port (if present)
   - iLO (MP) Serial Port
   - VGA device (MP/iLO)

3. Use the `conconfig` command to select your primary console. For example, to select "system serial port" as your primary console, enter the following at the command line:

```
Shell> conconfig 1 primary
```

4. Next, use the `conconfig` to deselect all other consoles so that only one console is marked **P** and all others are marked **NC**. For example, if your `conconfig` output looks like the following:

```
CONSOLE CONFIGURATION
Index  Primary  Type     Device Path
1      P        Serial   Acpi(HWP0002,PNP0A03,0)/Pci(1|2)
2      S        VGA      Acpi(HWP0002,PNP0A03,0)/Pci(4|0)
```

   Enter:

```
Shell> conconfig 2 off
```

   Now your `conconfig` output should look like this:

```
CONSOLE CONFIGURATION
Index  Primary  Type     Device Path
1      P        Serial   Acpi(HWP0002,PNP0A03,0)/Pci(1|2)
2      NC       VGA      Acpi(HWP0002,PNP0A03,0)/Pci(4|0)
```

   Note that the unwanted VGA device in line 2 has the status of **NC** and the primary console in line 1 has the status of **P**.

5. Reboot your system.

TIP: For more information on the `conconfig` command, enter the following at the EFI prompt:

```
help conconfig
```

Using the EFI Boot Manager to Select the Primary HP-UX Console

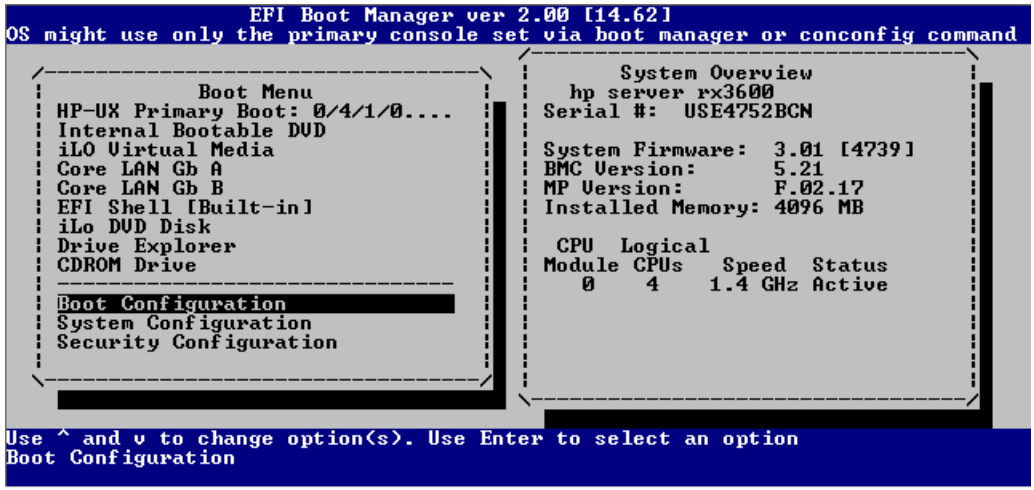
1. Decide what console you want to use.

   Depending on your system configuration, HP-UX can use one of the following devices as your system console:

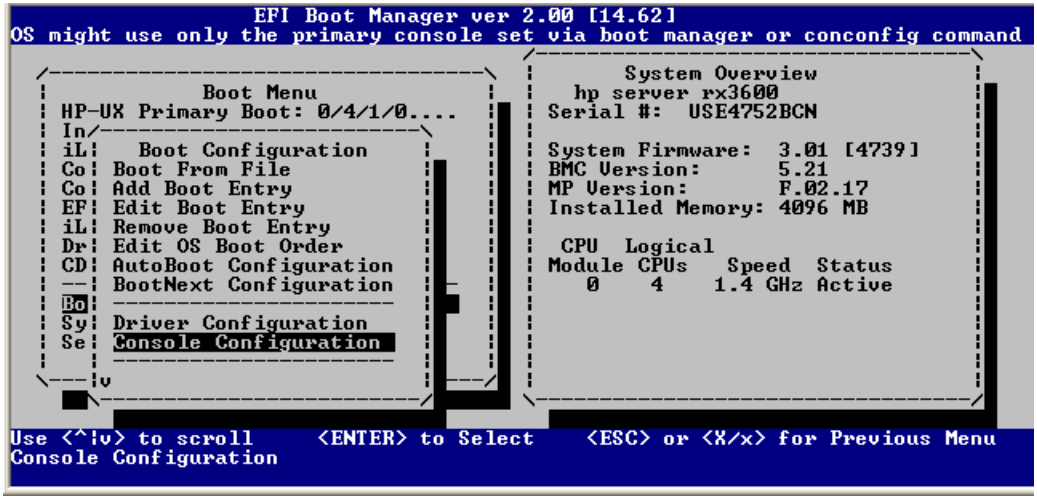
   - System Serial Port (if present)
   - iLO (MP) Serial Port
   - VGA device (MP/iLO)

2. Using the EFI menu, do the following:

a. Open the EFI Boot Manager and select **Boot Configuration**, as in the following:



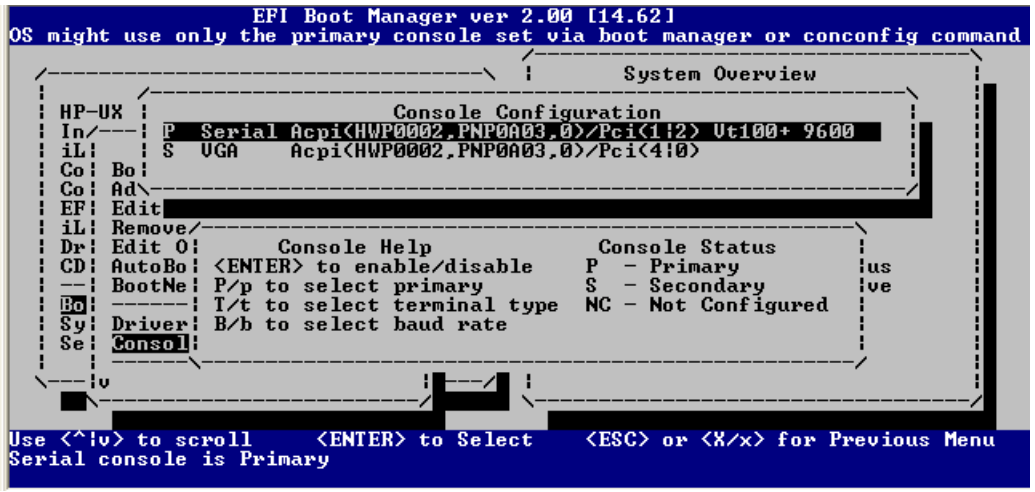
b. On the Boot Configuration screen, choose **Console Configuration**, as in the following:



c. On the Console Configuration screen, select *one* device as your system console. The device you have selected should have a status of **P**; all others should have a status of **NC**.

NOTE: The following figure shows consoles with a primary (**P**) status and secondary (**S**) status. This would not be correct for your configuration. You should select only *one* device for a **P** status. The rest should be given an **NC** status.

Only one active console should be configured; otherwise, HP-UX may either fail to boot or boot with output directed to the wrong location.



Understanding Interface Differences Between Itanium-based Systems

If you select either a system or an MP/iLO serial port, HP recommends you choose a VT100-capable terminal device.

Serial port, MP/iLO and VGA device paths can vary between each Itanium-based system. Please refer to the appropriate platform documentation for your product for information on determining the device paths.

You can find more information on the EFI Paths used for console selection in the Intel® Extensible Firmware Interface (EFI) documents available from the Intel website.

Task 2: Backing Up Your Configuration Files

If you plan to cold-install HP-UX 11i v3 on a system that already has HP-UX installed, make sure to save the files that you want to reinstall, such as:

- Configuration files in `/etc`
- The contents of `/usr/local`
- Any local home directories (that is, those you do not import from another system)
- Any configuration files located in the `/etc/opt` directories for installed software

If multiple users are preparing for the cold-install, you might consider creating a file system. Mount it with `smh`. Then create a subdirectory for each system or user (for example, `/backup/your_sys`).

As root, copy the files. For example:

1. Copy all config files from `/etc` on a system named `system1` to system `system2`. On `system2`, enter:

   ```
   mkdir /backup/system1/etc
   rcp -p your_name@system1:/etc/* /backup/system1/etc/
   ```

2. Copy your local home directory to the backup system:

   ```
   mkdir /backup/system1/home
   rcp -pr your_name@system1:/home/ /backup/system1/home/
   ```

Task 3: Making a Recovery Image of Your System

Any data on the client disks that are used for installation, including the operating system, are removed entirely as part of this installation process. Make a recovery image of your system so you can easily restore it to its original state if a problem occurs. See "Backing Up Your System" (page 56) for more information.

Task 4: Updating Your Ignite-UX Server

Ignite-UX supports network-based installations, which might be convenient when installing many systems. For more information, see the *Ignite-UX Administration Guide* (http://docs.hp.com/en/oshpux11iv3.html#Ignite-UX).

Task 5: Locating Source Media and Codewords

Locate the source media needed for the cold-install. See "Locating Source Media and Codewords" (page 59) for instructions.

Update Tasks

Prior to updating to HP-UX 11i v3, perform these tasks:

- Identify all software products and bundles on your system.
- Rebuild the HP-UX kernel.
- Rename your log files to make it easier to find problems encountered during an update.
- Back up your operating system using the Ignite-UX `make_net_recovery` or `make_tape_recovery` command.
- Locate source media and codewords.

Task 1: Identifying Software Versions

1. List the bundles and products installed on your system:

   `/usr/sbin/swlist -l bundle -l product> /tmp/software_list`

2. Check the list to determine which bundles and products you wish to update on your system. Make sure to save the output of the `swlist` command so you can reference it later.
3. After updating to HP-UX 11i v3, run the `swlist` command again and compare the output to the output of the `swlist` command you saved in step 1 to determine what software products and bundles still need to be updated.

Task 2: Rebuilding the Kernel

The update can fail if the HP-UX kernel build fails in the starting environment. To ensure that you have a reliable starting point, rebuild the kernel before you update:

1. As root, enter:

   `/usr/sbin/mk_kernel`

2. Fix any problems listed in the `mk_kernel` output.
3. Reboot your system to ensure that your new kernel boots.

Task 3: Renaming Your Log Files

To make it easier to look for problems encountered during an update, rename the log files before starting an update:

1. **`cd /var/adm/sw`**
2. As root, rename each log file. For example:

   `mv swagent.log swagent_old.log`

Task 4: Backing Up Your System

Back up your system before performing an update, and again after the update is complete. If a problem occurs, you can easily restore the system to its original state. See "Backing Up Your System" (page 56) for more information.

Task 5: Locating Source Media and Codewords

Locate the source media needed for the update. See "Locating Source Media and Codewords" (page 59) for instructions.

Backing Up Your System

Back up your system before performing a cold-install or update, and again after the cold-install or update. If a problem occurs, you can easily restore the system to its original state. Backing up your system includes the following tasks:

- Task 1: Creating an Operating System Recovery Image
- Task 2: Backing Up Your Data Files

Task 1: Creating an Operating System Recovery Image

To protect your system data, create an operating system recovery image to be used in the event of cold-install or update problems:

- The Ignite-UX server has two commands you can use to create an operating system recovery image:
  - `make_net_recovery`

    Use this command to create an operating system recovery image and store it on an Ignite-UX server on the network. This command works on any system that has Ignite-UX installed. See "Using make_net_recovery" (page 56).

  - `make_tape_recovery`

    Use this command to create an operating system recovery image on a bootable recovery tape. This command works on any system that has a local tape drive and Ignite-UX installed. This command also works on any system without an Ignite-UX server. See "Using make_tape_recovery" (page 57).

- The Dynamic Root Disk (DRD) toolset can also be used to create an operating system recovery image:
  - `drd clone`

    Use this command to create an operating system image on a free local or SAN disk. This command works on any system that has the DRD toolset installed. See "Using drd clone" (page 58).

NOTE: The Ignite-UX recovery tools and DRD toolset are intended to be used in conjunction with data recovery applications to create a means of total system recovery. HP does not recommend using Ignite-UX recovery tools to backup and recover data other than essential system data. The DRD toolset can only be used to backup the root volume group.

Using make_net_recovery

The Ignite-UX product has the `make_net_recovery` command to create an operating system recovery image on another system on the network. The image created by `make_net_recovery` is specific to the system it was created for and its identity includes host name, IP address, networking information, and so on. In the event of

root disk failure, you use the Ignite-UX server to restore the system by installing the operating system recovery image.

The contents of the operating system recovery image always includes all files and directories that are essential to bringing up a functional system. This essential list is predefined by `make_net_recovery`.

You can run `make_net_recovery` in its interactive mode to review the directories and files that make up the essential list, and to add or remove other data from the image on a disk/volume group, file, or directory basis.

For more information on using `make_net_recovery`, refer to the *make_net_recovery*(1M) manpage or the *Ignite-UX Administration Guide* (http://docs.hp.com/en/oshpux11iv3.html#Ignite-UX).

Using make_tape_recovery

The Ignite-UX product's `make_tape_recovery` command creates a bootable operating system recovery tape for a system while it is up and running. When a system has a logical volume layout, the recovery tape only includes data from the root volume group, plus data from any non-root volume group containing the `/usr` directory.

You can run `make_tape_recovery` locally on the system from which you are trying to make an operating system recovery tape. To create the bootable recovery tape, enter:

```
/opt/ignite/bin/make_tape_recovery -Av
```

where `A` specifies the entire root disk or volume group and `v` is for verbose mode. Additionally, you can specify more than one volume group with the `-x` option.

If you intend to use a tape drive other than the default (`/dev/rmt/0m`), modify the command to point to the device you want to use, for example, a tape drive at `/dev/rmt/3mn`:

```
/opt/ignite/bin/make_tape_recovery -Av -a /dev/rmt/3mn
```

To recover a failed system disk or volume group after an operating system recovery tape has been made, simply load the recovery tape, boot the system and interrupt the boot sequence to redirect to the tape drive. Allow the install process to complete. Do not intervene. The system will reboot and, because map files for all associated volume groups have been saved on the tape, any other existing volume groups are imported and mounted automatically. Data that is not in the root volume group must be backed up and recovered using normal backup utilities.

For more information on using `make_tape_recovery`, refer to the *make_tape_recovery*(1M) manpage on an Ignite-UX server or the *Ignite-UX Administration Guide* (http://docs.hp.com/en/oshpux11iv3.html#Ignite-UX).

Using drd clone

The `drd clone` command allows you to create an operating system recovery image, referred to as an inactive clone, on a free internal or SAN disk. For recovery purposes, all you need to run is

```
drd clone -t target_dsf
```

where *target_dsf* is the device special file of the spare disk.

In the event that the update to HP-UX 11i v3 on the active system does not go as planned, you can activate and boot the HP-UX 11i v2 clone in minutes by entering:

```
drd activate -x reboot=true
```

If you do activate and boot the HP-UX 11i v2 clone, then decide to re-activate the HP-UX 11i v3 image on the original disk, you can use the same `drd activate` command noted above, as the use of this command will toggle between the original disk and the clone disk.

NOTE: Once you have updated from 11iv2 to 11iv3 on the active system image, you can go back and forth between the inactive 11iv2 image and the updated 11iv3 image by ensuring the following:

- That you have manually installed DRD version A.3.1.0.1027 or greater onto your updated HP-UX 11i v3 system image if you updated to HP-UX 11i v3 update 1 (September 2007) or update 2 (March 2008). Due to a packaging problem that has now been fixed, the 11i v2 version of DRD does not get automatically updated on the 11i v3 system.
- That you do **not** use the `drd runcmd` operation when an HP-UX 11i v2 system is booted, and HP-UX 11i v3 is installed on the inactive image. Use of this operation would invoke 11i v3 libraries and executables, which can make system calls not supported on the 11i v2 kernel.

The drd clone contains all files and directories in the root volume, and thus has all the components that are essential to bringing up a functional system.

For more information on using `drd clone` and the DRD toolset, refer to the *Dynamic Root Disk System Administrators Guide for HP-UX*, DRD white papers, and other DRD documentation (http://docs.hp.com/en/DRD/infolib.html).

Task 2: Backing Up Your Data Files

There are a number of different backup methods you may wish to choose from depending on your system backup needs and your configurations. Some recommended backup methods are:

- HP OpenView Storage Data Protector
- HP-UX `fbackup`/`frecover` utilities

Choosing HP Storage Data Protector for Backup

If you are backing up large numbers of systems, the HP Storage Data Protector software product can be particularly useful. HP Data Protector is faster than other backup methods and provides for unattended backup as well. It allows you to efficiently centralize and administer backup procedures.

Using HP Data Protector involves setting up a database server and running software that directs and records the backup process for clients. For more information, see the HP OpenView Storage Data Protector website at

http://h18006.www1.hp.com/products/storage/software/dataprotector/

Choosing HP-UX fbackup/frecover utilities

Use the `fbackup` and `frecover` commands to selectively back up and recover files. The `fbackup` command can do the following:

- Indicate specific files or directories to include or exclude from a backup
- Specify different levels of backup on a daily, a weekly, or monthly basis
- Create an online index file

The `frecover` command restores backup files made using the `fbackup` utility. The `-r` option to the `frecover` command is generally used for recovering all files from your backup; the `-x` option is used for restoring individual files to your system. For complete details, see the *frecover* (1M) and *fbackup* (1M) manpages for examples.

Locating Source Media and Codewords

Now that you have backed up your system and important data files, locate the source media needed for the cold-install or update. See the section called, "Media Kit Contents" (page 19) for more information.

You can obtain a codeword for a purchased product by contacting one of the HP licensing services in Table 4-1:

Table 4-1 HP Licensing Services

Location	Telephone	Email
Asia	0120.42.1231 (Inside Japan) 0426.48.9310 (Inside Japan) +81.426.48.9312 (Outside Japan)	sw_codeword@hp.com
Europe	+33 (0)4.76.14.15.29	codeword_europe@hp.com
North America	(800) 538-1733	hplicense@mayfield.hp.com

NOTE: For more information on HP licensing services and codeword redemption, go to Software License Manager website:

http://licensing.hp.com

The Codeword Request forms also list the telephone numbers and website for codeword redemption.

The Next Step

You are now ready to cold-install or update to HP-UX 11i v3.

- **To cold-install:** see Chapter 5: "Cold-Installing HP-UX 11i v3 From Media" (page 61).
- **To update:** see Chapter 6: "Updating to HP-UX 11i v3" (page 77).

5 Cold-Installing HP-UX 11i v3 From Media

This chapter describes cold-installing HP-UX 11i v3.

What You Will Find in This Chapter

- "Before You Begin" (page 61)
- "Reviewing the Cold-Install Process" (page 61)
- "Cold-installing HP-UX 11i v3" (page 62)
- "Post-Install Tasks " (page 73)
- "The Next Step" (page 75)

Before You Begin

Before you cold-install HP-UX 11i v3, make sure that:

- Your system meets the system requirements to install and operate HP-UX 11i v3. For more details see Chapter 2: "System Requirements for Cold-Installing and Updating" (page 21).
- You have completed the preparation tasks required to cold-install your system. Most importantly, make sure you created an operating system recovery image to protect your data in the event of a system crash. For more information see Chapter 4: "Preparing to Cold-Install or Update to HP-UX 11i v3" (page 47).
- You have available networking information and other data that you need to collect as described in the section, "Before You Begin" (page 63).
- You have these DVDs ready from the HP-UX 11i v3 media kit:
  - HP-UX 11i v3 DVDs
  - HP-UX 11i v3 Applications DVD

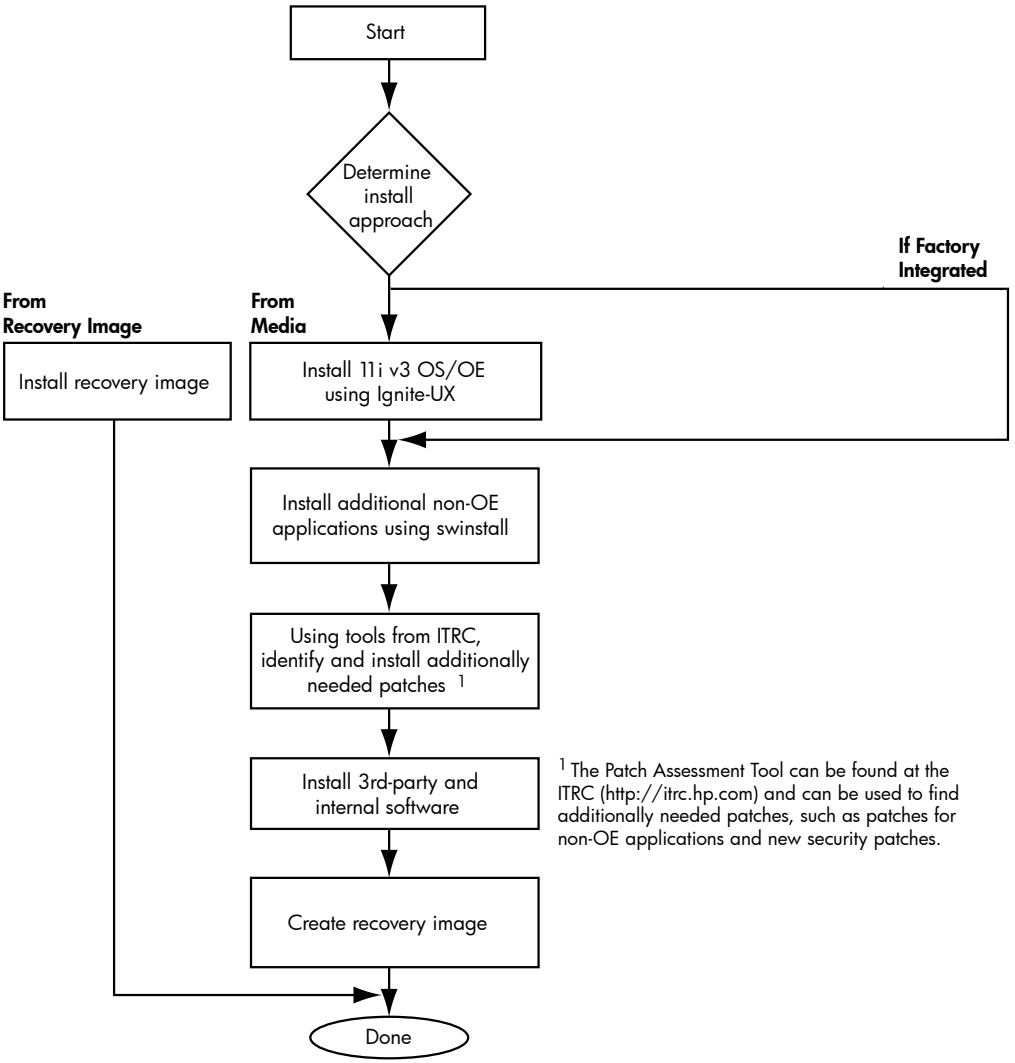
NOTE: If you have ordered a new system with the Instant Ignition option (also known as factory integrated), the cold-installation process described here has already been performed. Skip this chapter and proceed to installing applications in Chapter 7: "Installing HP Applications and Patches" (page 97).

Reviewing the Cold-Install Process

Figure 5-1 (page 62) shows the overall process of cold-installing HP-UX 11i v3 from media. You can also cold-install HP-UX 11i v3 from network depots and from golden images. For more information on these alternative methods of cold-installing refer to the *Ignite-UX Administration Guide* (http://docs.hp.com/en/oshpux11iv3.html#Ignite-UX).

NOTE: If your system is on HP Mission Critical Support, discuss the proper installation method with your HP Customer Engineer.

Figure 5-1 Cold-installing HP-UX 11i v3



Cold-installing HP-UX 11i v3

This section describes cold-installing from the HP-UX 11i v3 DVDs.

Before you begin, review Appendix A (page 105) for any installation issues that apply to your system.

This section contains the following tasks:

- “Task 1: Booting Your Machine” (page 65)
- “Task 2: Selecting Your Installation Type” (page 67)
- “Task 3: Configuring Your Installation” (page 69)
- “Task 4: Finishing Your Installation” (page 72)

CAUTION: The cold-install process overwrites everything on all disks selected to participate in the install. Make sure you have completed backups in “Backing Up Your System” (page 56).

Before You Begin

Before you cold-install HP-UX 11i v3, you need to collect information about your existing system. This section contains tables where you can record information. Then, when you are installing HP-UX 11i v3, you use information from the Miscellaneous Data and Network Data collection tables when needed.

Use the collection tables:

- If you chose the Advanced Installation, an interface gives you the opportunity to enter all of this data at the beginning of the install. The Advanced Installation also gives you more control over file system configuration. The interface is a tabbed file-folder and character-based.
- If you choose to network-enable your system, you must designate a unique host name, host Internet Protocol (IP) address, and other network information for your server.

  Contact your site network administrator for the details to include in these tables.

NOTE: During an installation, Ignite-UX configures the root, dump, and swap devices with the new HP-UX 11i v3 mass storage stack agile addressing representation. This means that, after installing, the commands that display the boot, dump, and swap devices will show them using the agile form. During a cold-install of HP-UX 11i v3, both legacy and persistent DSFs are automatically created. By default, the installation process will configure system devices like the boot, root, swap, and dump devices to use persistent DSFs. For more information on the new mass storage stack, see the white paper called, *The Next Generation Mass Storage Stack: HP-UX 11i v3* at http://docs.hp.com/

Miscellaneous Data Collection Table

Table 5-1 may contain some items that are not familiar to you, but you will be prompted for this information during the install.

The install process describes all options in detail, so you can defer making decisions about items that are unfamiliar to you until you reach that point in the install.

Table 5-1 Miscellaneous Data

Type of Data	Your Specific Data
Root Disk Path **NOTE**: Your root disk will typically display a legacy style Path name. However, HP-UX 11i v3 contains a new naming scheme for Root Disks. Please refer to the white paper called, *The Next Generation Mass Storage Stack: HP-UX 11i v3* for information on how to identify your legacy root disk device name in the agile HP-UX 11i v3 naming scheme. You can display the legacy hardware path using the **More Info** screen to show details on a specific lunpath hardware path.	
Root Swap Space	
Filesystem Type: LVM with VxFS (4.1 or 5.0), VxVM 5.0 with VxFS 5.0, or Whole disk with VxFS (4.1 or 5.0)	
Root Disk Volume Group Disks (How many disks you want placed into the root disk volume group and whether or not you want the disks to be striped or mirrored?)	
Select additional software	
Pre-Installed Disk Information (Is overwritten during the install disk; see Root Disk Path)	

Network Data Collection Table

Table 5-2 provides HP-UX commands that you can use after the install to confirm specific information.

Table 5-2 Network Data

Type of Data	Your Specific Data	HP-UX Command to Confirm Data After System is Up and Running
Host Name		`uname -n`/*hostname*
Host IP Address		`nslookup` *hostname*
Subnet Mask		`grep SUBNET_MASK /etc/rc.config.d/netconf`
Default Gateway IP Address		`grep ROUTE_GATEWAY /etc/rc.config.d/netconf`
Domain Name		`cat /etc/resolv.conf`
DNS IP Address		`cat /etc/resolv.conf`
NIS Domain Name		`grep NIS_DOMAIN /etc/rc.config.d/namesvrs`

Task 1: Booting Your Machine

This task describes how to boot your system from the install media. If you want to boot an Itanium-based system, follow the instructions in the section called, Booting Your Itanium-based System below. If you want to boot a PA-RISC system, follow the instructions in "Booting Your PA-RISC System" (page 66).

Booting Your Itanium-based System

1. Make sure any external devices that need to be configured at cold-install are connected to the target system and are turned on and operational.
2. Insert the HP-UX 11i v3 DVD (Disk 1) into the drive.
3. Turn the system on, reboot, or cycle power.
   - If the system boots automatically, the kernel scans the system for I/O devices.
   - If the system does not boot automatically, it goes to the boot menu. It is a timed menu; press any key to stop the timer. Then, you can run the install manually from the EFI shell using the following steps:

   a. From the boot menu, select `EFI Shell (Built In)`.

   b. At the EFI shell prompt, specify the device name (for example, fs1:) for the DVD-ROM and then enter the EFI install command, as in the following example

   If the device is not automatically selected, select the device name for the DVD-ROM and then execute `install`. For example, from the EFI shell prompt, you may see something similar to the following:

   ```
   Shell> fs1:

   fs1:\> install
   ```

   If you do not see the DVD-ROM device, use the `map` command to list all device names from the EFI shell prompt.

   The list of devices is displayed automatically, and the install process selects the device for you.

NOTE: Your DVD device may not always be `fs1`. Make sure you verify the ID appropriate to your DVD device.

After the kernel has booted, it scans the system for I/O devices.

Booting Your PA-RISC System

1. Make sure any external devices that need to be configured at cold-install are connected to the target system and are turned on and operational.
2. Insert the HP-UX 11i v3 DVD into the drive.
3. Stop the autoboot by pressing any key.

   The boot console menu is displayed. If you need help, enter: **`HELP`**
4. Ensure that Fast Boot is enabled.
   1. Select the Configuration Menu: **`CO`**
   2. If the Fast Boot selection is available, switch Fast Boot ON:

      `FB ON`
   3. Return to the Main Menu: **`MA`** (Remember to switch Fast Boot back OFF after installing HP-UX 11i.)

      The full memory check that is run when Fast Boot is OFF may take several hours on a large system.
5. Search for bootable devices, using the choices displayed (for example, enter **`search`** or **`sea`**). A table similar to this is displayed:

```
Path#  Device Path       Device Type
-----  -----------       -----------
P0     SCSI               HP DVD-ROM
P1     LAN.1.2.3.4.5.6   1.2.3.4
P2     FWSCSI.6.0        IBM DDRS-34560WS
```

   Of the media listed, a fast/wide SCSI device (`FWSCSI`) is usually a disk, whereas a single-ended SCSI device (`SCSI`) can be a disk or CD/DVD drive.

NOTE: The **`search`** or **`sea`** command will only display legacy hardware paths and will not display agile hardware paths. You will see the agile hardware path after booting your system. Please note that both forms of hardware paths are supported (legacy and agile) and you can specify either hardware path in the `Boot` command. However, only the legacy hardware path can be displayed from the `Search` command.

6. For a legacy hardware path, boot from the DVD drive using the listed path number. For the drive shown in the previous example (P0), enter: **`BOOT P0`**

   Please note that if you know the agile hardware path, you may enter it as well, however it requires a specific format compatible with the BCH interface limited to 32-bit elements. Use the command, `ioscan -e` to display the boot path format to be used here to enter a lunpath hardware path in the `BOOT` command.

   For an agile hardware path, boot from the DVD drive using the full agile hardware path name: BOOT *`full_hardware_path`*

   For more information on agile hardware paths, refer to the white paper called, *The Next Generation Mass Storage Stack: HP-UX 11i v3* at the HP Technical Documentation website:

   http://docs.hp.com/

7. After a few minutes, at the `Interact with IPL?` prompt press **`n`**.

   The install kernel loads (3-5 minutes), after which a screen might prompt you to enter the keyboard language of your console.

8. Enter the number and press **Enter** again to confirm.

Task 2: Selecting Your Installation Type

The system displays the Ignite-UX welcome screen for the HP-UX installation process. When the initial Ignite-UX welcome screen appears, read how to navigate and select choices on this terminal interface:

- Use the **Tab** key to navigate between fields and the arrow keys to navigate within fields.
- Use the **Enter** key to select an item. Pressing **Enter** or the spacebar opens a menu list.
- For Help, use **Ctrl-K** for navigation key help and **Ctrl-F** (or **F1**) for context-sensitive help.
- You can enter the underlined letter of an item (such as `I` for `install HP-UX`) to navigate more quickly.

The remainder of this section describes how to choose the degree of customization needed to configure your installation.

1. If the install detects that you have a PS2 or USB keyboard, the system displays the **Language Mapping** screen. Select the number of the language you want to use, for example, **26** and then press **Enter** to confirm your choice.

```
In order to use a keyboard on this interface, you must specify a
language mapping which will be used by X windows and the Internal
Terminal Emulator (ITE). The characters "1234567890" will appear as

"!@#$^&*()" on keyboards that use the shift key to type a number.
Your choice will be stored in the file /etc/kbdlang
1) USB_PS2_DIN_Belgian          2)USB_PS2_DIN_Belgian_Euro
3) USB_PS2_DIN_Danish           4)USB_PS2_DIN_Danish_Euro
5) USB_PS2_DIN_Euro_Spanish     6)USB_PS2_DIN_Euro_Spanish_Euro
7) USB_PS2_DIN_French           8)USB_PS2_DIN_French_Euro
9) USB_PS2_DIN_German           10)USB_PS2_DIN_German_Euro
11) USB_PS2_DIN_Italian         12)USB_PS2_DIN_Italian_Euro
13) USB_PS2_DIN_JIS_109         14)USB_PS2_DIN_Korean
15) USB_PS2_DIN_Norwegian       16)USB_PS2_DIN_Norwegian_Euro
17) USB_PS2_DIN_S_Chinese       18)USB_PS2_DIN_Swedish
19) USB_PS2_DIN_Swedish_Euro    20)USB_PS2_DIN_Swiss_French2_Euro
21) USB_PS2_DIN_Swiss_German2   22)USB_PS2_DIN_Swiss_German2_Euro
23) USB_PS2_DIN_T_Chinese       24)USB_PS2_DIN_UK_English
25) USB_PS2_DIN_UK_English_Euro 26)USB_PS2_DIN_US_English
27) USB_PS2_DIN_US_English_Euro
```

2. From the **Ignite-UX Welcome screen**, select **Install HP-UX** to begin interacting with the Ignite-UX (cold-install) program and then press **Enter**. The system displays the **User Interface and Media Options**.

3. From the **User Interface and Media Options** window, choose the degree of customizing needed to configure the installation. Mark your choices and select **OK**.
   - Select from one of the three choices shown in **Source Location Options**:
     - **Media only installation** is the default setting for installing from a DVD.
     - **Media with network enabled** is recommended when you want basic networking enabled during installation so you can load software from a network depot (when an Ignite-UX server is not available).
     - **Ignite-UX server based installation** is recommended if you have an Ignite-UX server configured on your network and you want to supply custom configurations during the installation.
   - Select from one of the choices shown in **User Interface Options**:
     - **Guided Installation** provides limited system configuration and is expected to be deprecated in a future release.
     - **Advanced Installation** enables you to accept all the default installation parameters or fully customize your system such as configuring multiple disks and adjusting file system sizes. HP recommends choosing the Advanced Installation option to configure your installation.
     - **No User Interface** is recommended if you want to accept all the default installation parameters and you do not need to verify the configuration using the user interface.

   The remaining sections take you through the **Media only installation** option and the **Advanced Installation** option. For more help on using the **Advanced Installation** screens, refer to the *Ignite-UX Administration Guide*. (http://docs.hp.com/en/oshpux11iv3.html#Ignite-UX).

Task 3: Configuring Your Installation

At this point, the system displays the **Basic** tab of the Ignite-UX itool Terminal User Interface (TUI) for the HP-UX Advanced installation process. The **Basic** tab shows all the basic information for setting up the file system and for loading the Operating Environment. It also allows you to configure languages, locale, and keyboard requirements.

1. In the Configurations field, select an overall system configuration that you want to use for this installation.
2. In the Environments field, select the type of Operating Environment you want to install on your system. Press **Enter** to view the choices.

3. In the Root Disk field, select the disk to store your root file system. Press **Enter** to view the choices. If you are unsure of what to choose, keep the default selection that has been determined by Ignite-UX.

   HP-UX 11i v3 contains a new naming scheme for Root Disks. Please note that the **Root Disk** screen displays the lunpath hardware path instead of the legacy hardware path. You can select **More Info** to view the legacy hardware path for the root disk selected.

   For further information, including disk requirements, supported peripherals, and preparing the client for installation, see the *Ignite-UX Administration Guide* (http://docs.hp.com/en/oshpux11iv3.html#Ignite-UX).

NOTE: The lunpath hardware path selected is used only to identify the Root Disk itself, and any available path to that disk may then be used as boot path. Therefore, it is normal to see a different lunpath hardware path to the disk used as boot path.

---

4. In the File System field, select the type of volume manager and file system you want to use for your root disk. Press **Enter** to view the choices.

IMPORTANT: Previous HP-UX 11i v3 Operating Environment Update Releases (OEURs) included VxFS 4.1 and VxVM 4.1. Starting with the September 2008 OEUR, the following versions are included: VxFS 4.1, VxFS 5.0, and VxVM 5.0. Only VxFS 4.1 is installed by default, meaning that all other versions are optional. This has important implications for many install scenarios. For detailed instructions and information about how this impacts you, consult Appendix C (page 129).

---

5. In the Languages field, press **Enter** to browse the available languages, marking the desired selections. You can make any of the selections your system default language. This will become the system default language after it is installed. Make sure **HPUXLocales** is marked **Yes**.

   The locale settings that were previously in HP-UX 11i v2 and located in the Common Desktop Environment (CDE) language bundle are now located in the `HPUXLocales` bundle. The `HPUXLocales` bundle contains internationalization support for many languages. This support includes date and time formats, currency, sorting methods, and so on.

NOTE: CDE is an optional product in HP-UX 11i v3. If you require it, you must explicitly select the CDE bundle (`CDE-xxx`). This applies if you need `dtterm`, which is located in CDE. For some localization situations, `dtterm` is required; therefore CDE must be selected.

6. Use the Software tab to change the software that will be installed on your system, if desired. If you chose the "No User Interface" option, then you cannot deselect the *recommended* (default-installed) software bundles.

   To improve the software selection process, HP-UX 11i v3 offers software product categories and install types from which you can select. See "HP-UX 11i v3 Operating Environment Install/Update Structure" (page 133). To select or deselect the software bundles:

   - Navigate to the Software tab.
   - If you wish to avoid a manual extra media swap, change the source from media to a network depot using the **Change Depot Location...** button in the lower right hand corner of the Software Tab.
   - Select any *optional* software that you want loaded onto your system and deselect any *recommended* (default-installed) software that you do not want. Browse the list, marking your selections. Use the arrow keys to select a bundle and the spacebar to change the option.

7. Use the System tab to configure system parameters such as security levels, host name, IP address, root password, and the time zone. You must set the appropriate security setting for your system at this time; you can choose to set the other system parameters now or at the first boot of your system, using *set_parms*(1M). For more information about setting appropriate security levels, see "Security Considerations" (page 37).

   To set the appropriate security settings for your system, do the following:

   - Navigate to the System tab and select Security Choices.

     The four security levels appear. By default, Sec00Tools is selected.

   - Select the appropriate security setting for your system.
   - Select **OK**.

8. Use the File System tab to perform a variety of filesystem and disk-configuration tasks: for example, resizing file systems and adding and removing disks. You can also re-configure the volume structure and associated file system mount points. The File System tab will differ in appearance, depending on whether you previously selected LVM or whole disk on the Basic tab.

   Please note that renaming or changing any disk file system structure on which Ignite-UX installs file system content causes the old file system on that disk to be

lost. For more information on using the File System tab, refer to the *Ignite-UX Administration Guide* (http://docs.hp.com/en/oshpux11iv3.html#Ignite-UX).

9. Use the Show Summary button to view a summary of how your system will be configured. If you see any problems, or want to change any of your selections, back up to the appropriate step, and make the needed changes; otherwise select Go! (at the bottom of the screen) to initiate the installation. Ignite-UX executes a pre-installation consistency check to identify any errors that must be corrected before the installation can proceed.
10. The system typically displays the Confirmation Dialog box that lists errors, warnings and notes for the configuration settings. Review any errors, warnings, or notes displayed in the Confirmation Dialog box. If there are any errors, they will need to be resolved before the installation can continue.

    Warning messages will list which disks that currently contain a recognized file system will be overwritten during the install process. If you see a disk in the list that you do not want included, back up to the root disk selection and choose another disk; if the settings are correct, continue on to the next step.
11. After you have reviewed all of the information on the Confirmation Dialog box and resolved any errors, select Go! (at the bottom of the screen) to initiate the installation.

    As the installation proceeds, you will see a log detailing output from the software installation. After the software is installed, the system will reboot prior to configuring the software and once again after installation is complete.

    If your system was factory integrated, or if you chose to set the system parameters at the first boot of your system, the system will power down after the installation and ask for these system parameters at the next boot of your system.

Task 4: Finishing Your Installation

If your system was factory integrated, or if you chose to set the system parameters at the first boot of your system, the system will power down after the installation and ask for these system parameters at the next boot of your system.

Reboot your system. The **Welcome to HP-UX** screen is displayed and you will be prompted through a series of screens.

You may need to select or specify other available networking drivers to enable other cards on your system.

1. To use a keyboard on this interface, you must specify a language mapping to be used by X Windows and the Internal Terminal Emulator (ITE). Choose the appropriate language. For English, select number **26**.
2. You are prompted to answer a few questions before you can use the system. The first is whether or not you plan to use the system on a network. If you completed

the pre-install data collection tables you have all the information you need for `set_parms`, so answer **Y** for yes.

3. Enter the basic network information that you collected in Table 5-1: "Miscellaneous Data", on the screens that are displayed.
4. Confirm your choices. You are now finished with the install procedures and presented with a login screen. Log in to the system as root.

Post-Install Tasks

After the cold-install, store the HP-UX DVDs in a safe place. You may need them to install drivers or other software later.

In addition, installing HP-UX 11i v3 installs a minimum set of default networking drivers that apply to the system. You may need to select or specify other available networking drivers to enable other cards on your system. Refer to the *HP-UX 11i v3 Release Notes* available at

http://docs.hp.com/en/oshpux11iv3.html

Task 1: Configuring OE Applications

After updating to an HP-UX 11i v3 Operating Environment (OE), some OE products need post-installation configuration to make them functional. This need may be indicated by a message logged in `/var/opt/swm/swm.log`.

Refer to each product's installation instructions for details. The location of OE product-specific documentation is listed in the *HP-UX 11i v3 Release Notes*, available on the Instant Information DVD and at http://docs.hp.com/en/oshpux11iv3.html#Release%20Notes.

Task 2: Migrating to the Agile Mass Storage Stack (Optional)

In HP-UX 11i v3 there are two types of DSFs for mass storage: legacy DSFs and persistent DSFs. Both can be used to access a given mass storage device independently and can coexist on a given system. The new mass storage stack for HP-UX 11i v3 is intended to supersede the existing mass storage stack. However, in HP-UX 11i v3 they can exist in parallel. Existing legacy DSFs will continue to work as before; they are completely backward compatible, and will not be affected by any persistent DSFs on the same server.

If you cold-install HP-UX 11i v3, both legacy and persistent DSFs are automatically created. By default, the installation process will configure system devices like the boot, root, swap, and dump devices to use persistent DSFs. This means that configuration files such as `/etc/fstab`, `/etc/lvmtab`, and others will contain references to persistent DSFs.

You may choose to migrate to the new agile mass storage stack or you can continue to use the legacy mass storage stack. If you want to use the new features of the agile mass

storage stack and are not affected by existing limitations, you may want to migrate to the new mass storage stack.

For more information on the new mass storage stack and to migrate from the legacy view to the agile view refer to the white paper called, *The Next Generation Mass Storage Stack: HP-UX 11i v3* and the white paper called *HP-UX 11i v3 Persistent DSF Migration Guide* at

http://docs.hp.com/

Task 3: Retrieving Information After Cold-installing

After completing the cold-install, you can retrieve the information you had previously saved onto another system.

Create a New Root Home Directory

Consider creating a root home directory that is not `/`. Doing this keeps the user root dot files out of the /directory. Make sure it is on the root volume by calling it something like `/homeroot`. Doing this is especially important if you are using Logical Volume Manager (LVM) and `/home` is a separate volume.

1. Log in as root.
2. Except on trusted systems, edit `/etc/passwd` to change the home directory from root to `/homeroot` and save it.
3. Create the `/homeroot` directory:

   `mkdir /homeroot`

4. Move root's personal files (files beginning with `.`) to `/homeroot`:

   `mv /.[^.]* /homeroot`

5. Exit and log in again as root.

Recover Files

Recover all the customized and personal files that you saved previously by merging them manually. For example, do not overwrite `/etc/passwd` with your old version. Instead, either paste in entries from your old files or *merge* the old information into the new files.

Restore /home

If you had a local home directory, you can restore it as follows:

- For instance, if you copied it to `/backup/system1/home`, enter these commands:

  `cd /backup/system1/home`

```
find . -depth | cpio -pdm /system1/home
```

- If you backed it up to tape with `fbackup`, enter:

  ```
  frecover -x -i /system1/home -v
  ```

Restore Other Files

Carefully use the same techniques to restore other files and directories, such as `/usr`, `/local`, and `/opt`. For help in importing entire volume groups, refer to either *HP-UX System Administrator's Guide* or *Managing Superdome Complexes*.

The commands cited in this section do not write over newer files, so your new operating system and any files you update are well protected.

The Next Step

Continue with Chapter 7: "Installing HP Applications and Patches" (page 97).

6 Updating to HP-UX 11i v3

This chapter describes updating your system to HP-UX 11i v3 using Update-UX.

What You Will Find in This Chapter

- "Before You Begin" (page 77)
- "Reviewing the Update Process" (page 78)
- "Updating Tips" (page 80)
- "Updating to HP-UX 11i v3" (page 80)
- "Updating to HP-UX 11i v3 Using the Terminal User Interface" (page 83)
- "Updating to HP-UX 11i v3 Using the Command Line Interface" (page 92)
- "Post-Update Tasks " (page 94)
- "The Next Step" (page 95)

Before You Begin

Before you update to HP-UX 11i v3, make sure that:

- You are updating from a supported migration path. See "Supported Update Paths to HP-UX 11i v3" (page 32).
- Your system meets the system requirements to update and operate HP-UX 11i v3. For more details see Chapter 2: "System Requirements for Cold-Installing and Updating" (page 21).
- You have completed the preparation tasks required to update your system. For more information see Chapter 4: "Preparing to Cold-Install or Update to HP-UX 11i v3" (page 47).

NOTE: Updating from a release of HP-UX to a version of HP-UX that was released earlier in time is not supported. This could cause system incompatibilities and unpredictable results. If you attempt to update to an earlier version of HP-UX, the update process will stop without making any changes to your system and you will get the following error message:

```
ERROR: You are attempting to update from your release
of HP-UX to a version of HP-UX that was released earlier in
time.  This is not supported.  The update process has stopped
without making any changes to your system.  Please see the
'Supported Update Paths' section of the HP-UX 11i v3
Installation and Update Guide for more information.
```

Reviewing the Update Process

This section describes updating to HP-UX 11i v3 using `update-ux` to selectively overwrite the operating system and application software from a media or network source depot.

Figure 6-1 (page 79) shows the overall update process. You can update your system using one of the following methods:

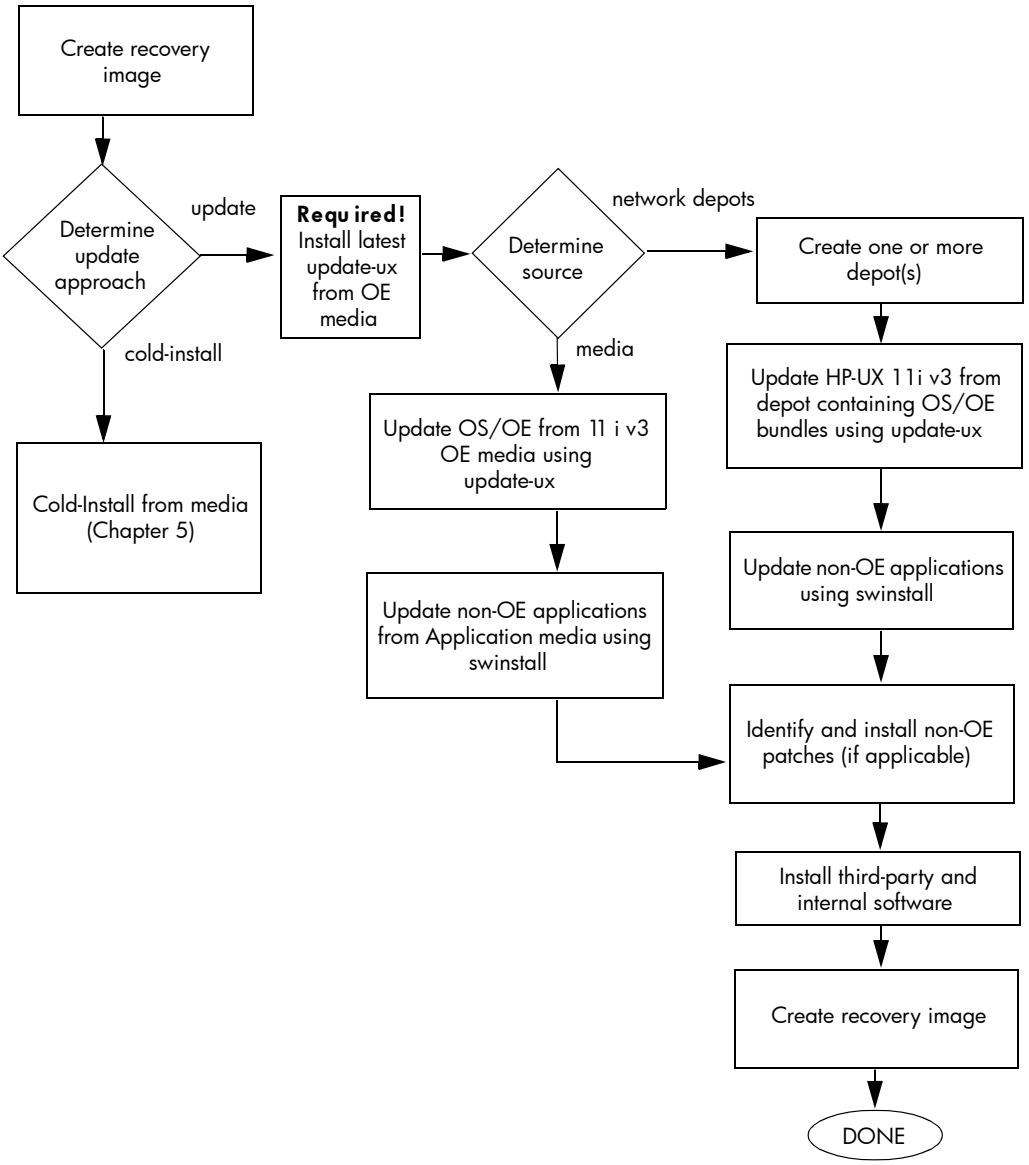
- From a network depot — Use Software Distributor commands to create depots containing OS, OE, and other software bundles, then update from the depot using the `update-ux` terminal user interface or command line interface. For help with this method, refer to the *swcopy*(1M) manpage, the *Software Distributor Administration Guide* (http://docs.hp.com/en/SD/index.html) and the *Ignite-UX Administration Guide* (http://docs.hp.com/en/oshpux11iv3.html#Ignite-UX).
- From DVD media — Use either the `update-ux` terminal user interface described in "Updating to HP-UX 11i v3 Using the Terminal User Interface" (page 83) or the `update-ux` command line interface described in "Updating to HP-UX 11i v3 Using the Command Line Interface" (page 92).

NOTE: If your system is on HP Mission Critical Support, discuss the proper method of installing the OE with your HP Customer Engineer.

IMPORTANT: You **must install** the latest version of Update-UX prior to updating your system. The latest version of Update-UX allows you to use the preview (`-p`) option, which is new for HP-UX 11i v3. Failure to install the latest version of Update-UX may cause the update to fail. For instructions, see "Task 2: Install the Latest Update-UX Bundle" (page 82).

IMPORTANT: Previous HP-UX 11i v3 Operating Environment Update Releases (OEURs) included VxFS 4.1 and VxVM 4.1. Starting with the September 2008 OEUR, the following versions are included: VxFS 4.1, VxFS 5.0, and VxVM 5.0. Only VxFS 4.1 is installed by default, meaning that all other versions are optional. This has important implications for many install scenarios. For detailed instructions and information about how this impacts you, consult Appendix C (page 129).

Figure 6-1 Updating to HP-UX 11i v3



Updating Tips

Table 6-1 suggests some tips and recommendations to be aware of during an update process:

Table 6-1 Updating Tips

Topic	Tip
Running Other Commands	During the update process, be careful when running other commands; doing so may cause the commands to function improperly.
All Software Does Not Get Updated	Update-UX updates the HP-UX OS and any software specified in additional software bundles available on the source media or depot. Update-UX may not automatically update software that is not contained in an Operating Environment. In addition, Update-UX may not automatically update optional software bundles that have changed names since the last release. If you have added extra software to your existing OE, check to see if it is available in the new OE. If not, you will need to reinstall this software separately after the update is complete. In addition, software products that are no longer supported on HP-UX 11i v3 may be either automatically removed during the update, or the system may generate messages that warns users that these unsupported software products must be removed before beginning the update process.

In Case of Trouble	The update-ux command returns an error value when it is not successful:
	`1 - Error during execution; update aborted.`
	`2 - Update aborted via user action (keyboard press)`
	Messages are recorded in `/var/opt/swm/swm.log` and `/var/adm/sw/update-ux.log`.
	If you encounter a problem during the update process, review Appendix A (page 105) for possible solutions.

Updating to HP-UX 11i v3

Updating your system using `update-ux` includes the following tasks:

- **Task 1: Create a network depot (optional).**

  Create a network depot only if you intend to update other systems on the network. If you are not creating a network depot, you can skip this task. See "Task 1: Create a Network Depot (Optional)" (page 81).

- **Task 2: Install the latest version of `update-ux`.**

  See "Task 2: Install the Latest Update-UX Bundle" (page 82).

- **Task 3: Update your system using `update-ux`.**

  You can choose two different methods to update to HP-UX 11i v3 on a supported system: 1) by the using the `update-ux` terminal user interface; 2) by using the

`update-ux` command line interface. See "Task 3: Update Your System Using Update-UX" (page 83).

After updating to HP-UX 11i v3, you might need to configure OE Applications to make your system fully functional. See "Post-Update Tasks " (page 94) for instructions.

NOTE: In HP-UX 11i v3, there are two types of DSFs for mass storage: legacy DSFs and persistent DSFs. Both can be used to access a given mass storage device independently and can coexist on a given system. During an update from HP-UX 11i v2 to 11i v3, existing legacy DSFs are retained and persistent DSFs will be created. Configuration files will not be modified, so system devices will continue to use the existing legacy DSFs. For more information on the new mass storage stack, see the white paper called, *The Next Generation Mass Storage Stack: HP-UX 11i v3* available at the following website:

http://docs.hp.com/

NOTE: Secure Path is no longer supported on HP-UX 11i v3. The new mass storage stack in HP-UX 11i v3 provides integrated Native Multipathing capability. For more information on migrating from Secure Path to Native Multipathing in HP-UX 11i v3, see the *Migrating from HP StorageWorks Secure Path for Active-Active Disk Arrays to Native Multipathing in HP-UX 11i v3* available at

http://docs.hp.com/

Task 1: Create a Network Depot (Optional)

Create a network depot **only** if you intend to update other systems on the network using a depot. This allows you to update all systems on the network without having to move media from system to system. It also allows you to use the preview (`-p`) option, which is new for HP-UX 11i v3. You can use the preview (`-p`) option with either a depot or media. If you are not creating a network depot, you can skip this task.

As root, follow this procedure to create a network depot from the HP-UX 11i v3 two-DVD set onto a depot server:

NOTE: Make sure you copy all products from both HP-UX 11i v3 DVDs to your target depot.

---

1. Verify that you have at least 6 GB of free space to create the network depot on another system in your network. If this space is not available, use `smh` either to create a new volume group or to extend an existing volume group. For help, refer to either `SMH` help or the *HP-UX System Administrator's Guide*.
2. The HP-UX 11i v3 operating system comes as a two DVD set. Insert the first DVD into the drive.

3. Find the DVD-ROM device file name:

   ioscan -C disk -f -n -k | more

   /dev/dsk/c1t2d0 is a typical device name.

4. Create the directory under root (/):

   mkdir /dvdrom

5. Mount the *first* DVD onto the new directory as a file system, for example:

   mount /dev/dsk/c1t2d0 /dvdrom

6. Create the directory that will contain the network depot you want to create, for example:

   mkdir /var/11iv3

7. Copy all products on the mounted DVD to the target depot. For example, to copy the contents of the *first* DVD to the target depot called update-depot type the following command:

   swcopy -s /dvdrom * @ /var/11iv3/update-depot

8. Unmount the *first* DVD from its directory:

   umount /dvdrom

9. Mount the *second* DVD onto the new directory as a file system, for example:

   mount /dev/dsk/c1t2d0 /dvdrom

10. Copy all products on the mounted DVD to the same target depot. For example, to copy the contents of the *second* DVD to the target depot called update-depot type the following command:

    swcopy -s /dvdrom * @ /var/11iv3/update-depot

11. Unmount the *second* DVD from its directory:

    umount /dvdrom

The network depot is now ready to update your system to HP-UX 11i v3. Continue with "Task 2: Install the Latest Update-UX Bundle" (page 82).

Task 2: Install the Latest Update-UX Bundle

Prior to updating your system, you **must** install a supported version of the update-ux command from the Operating Environment DVDs.

This procedure walks you through the installation of the latest version of the Update-UX bundle, which includes the update-ux command, from the Operating Environment DVD media.

From the DVD Media

1. Find the DVD-ROM device file name:

   `ioscan -C disk -f -n -k | more`

   A device name associated with your DVD device should be displayed. For example:

   `/dev/dsk/c1t2d0`

2. Create the directory under root (`/`). For example:

   `mkdir /dvdrom`

3. Mount the DVD onto the new directory as a file system. For example:

   `mount /dev/dsk/c1t2d0 /dvdrom`

4. Using `swinstall`, install the latest version of the `Update-UX` bundle on the target system.

NOTE: Make sure you use the correct case to install the `Update-UX` bundle (in title case). This bundle contains the `update-ux` command (lowercase).

`swinstall -s /dvdrom Update-UX`

From a Depot

The depot example uses the following syntax: *`depot_server`*`:`*`depot_path`*. For example:

`swinstall -s depot_server:/var/11iv3/update-depot Update-UX`

Task 3: Update Your System Using Update-UX

After you have installed the `Update-UX` bundle on the target system and, optionally, created a network depot containing all software to be installed, you can update your target system. You can update to HP-UX 11i v3 using one of the following methods:

- `update-ux` terminal user interface. See "Updating to HP-UX 11i v3 Using the Terminal User Interface" (page 83).
- `update-ux` command line interface. See "Updating to HP-UX 11i v3 Using the Command Line Interface" (page 92).

NOTE: Before you update your system to HP-UX 11i v3, review the known problems in Appendix A (page 105). Make sure to resolve any applicable issues before starting an update from HP-UX 11i v2 to HP-UX 11i v3.

Updating to HP-UX 11i v3 Using the Terminal User Interface

This section describes how to update your system using the `update-ux` Terminal User Interface (TUI).

With the TUI, you use the **Arrow**, **Tab**, **Space**, and **Return** keys to navigate.

There are seven steps in the TUI `update-ux` process:

Table 6-2 TUI update-ux Steps

1. Start-Up	Start the `update-ux` TUI.
2. Select Source	Provide the location of the software depot from which the software will be installed.
3. Select OE	Select the OE that you wish to update to.
4. Select Software	Choose the software in the OE you selected to update.
5. Analysis (Preview)	Analyze (preview) the update selections to determine if the selected software can be updated successfully.
6. Update	Perform the actual software update.
7. Verify Update	Verify that the software update was successful.

Step 1: Start-Up

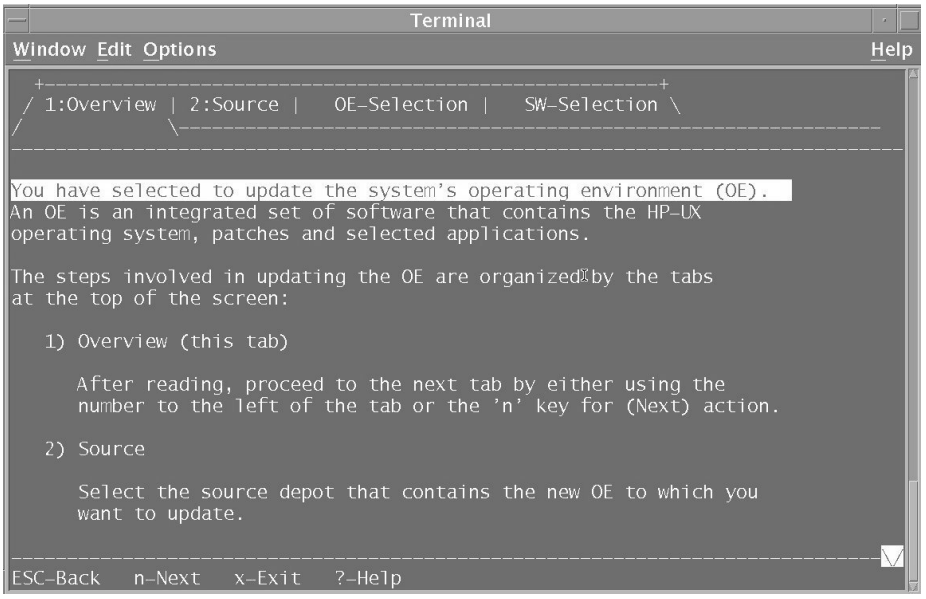
1. To start the TUI for an update session, type:

   ```
   update-ux -i -s /dvdrom
   ```

   The TUI is automatically invoked and the Update-UX Overview tab appears. If any screen other than the Overview tab appears, press **1** to display the Overview tab. This tab provides an overview of the update process. Follow the numbered tabs to update the OE.

   Use the navigation legend at the bottom of each screen to navigate and select options on this terminal interface.

Figure 6-2 Overview Screen

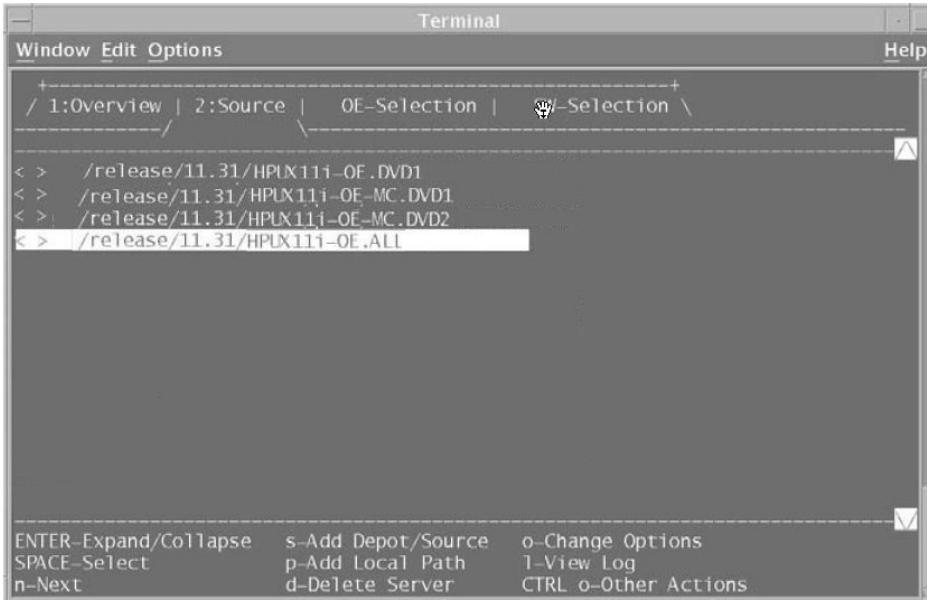


2. After reviewing the information on the Update-UX Overview tab, type **n** (next) to proceed to the Source Selection tab.

Step 2: Select Source

The Source Selection tab appears. The Source Selection tab displays a list of registered source depots on the local host system.

Figure 6-3 Select Source Tab



1. Specify the source depot that contains the new OE that you want to use to update your target system. The system automatically selects the local host and default depot path.

   You can expand any entry that is preceded by the + sign. This allows you to view the available depots on the server.

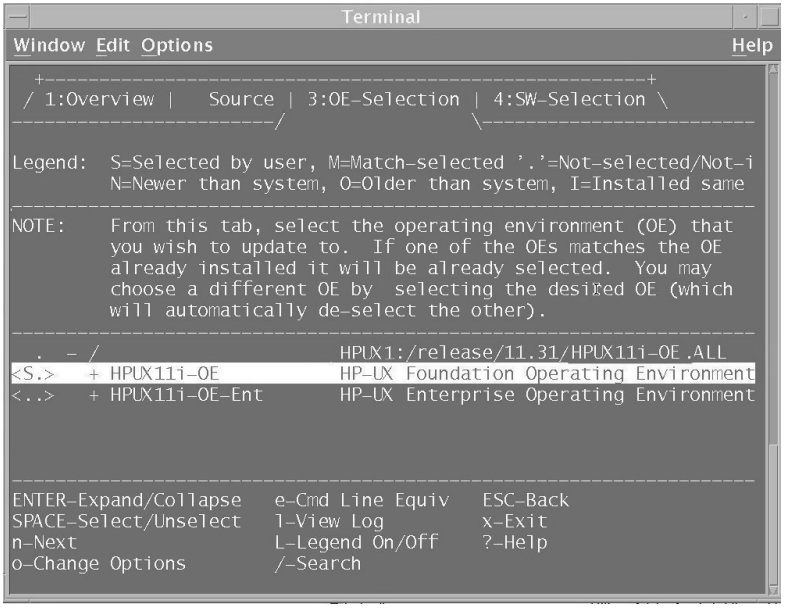
2. If the depot containing the software you want to install does not appear in the list, you can do one of the following:
   - Add another host system to the list of registered source depots, by entering **s** (**`Add Server/Depot`**) and then entering the name of the new source host; or
   - You can also remove a host system from the list of registered source depots, by entering **d** (**`Delete Server`**).
3. Press **Enter**. The system retrieves all the depots available for the host name specified and displays a list of registered depots on the source host.
4. Use the spacebar to select the depot containing the software you want to install.
5. Enter **n** (next) to confirm your selection and proceed to the OE Selection tab. (The system displays the message "`Reading Data from Source`" before displaying the next tab.)

Step 3: Select OE

The OE Selection tab appears. An Operating Environment (OE) is an integrated set of software that contains the HP-UX operating system, and selected applications.

The OE Selection tab displays the list of OEs to which you can update. The OE that matches the one currently installed on your system is automatically selected. You may choose a different OE by selecting it (which will automatically deselect the other).

Figure 6-4 OE Selection Tab



1. Use this screen to select and review the contents of the OE you want to update. There are three categories in the OE that you can review: `optional`, `required`, and `recommended`. Highlight the category you would like to review and press **Enter** to expand and view its contents.

   On this tab you can review the software contents included within the OE.

NOTE: You *cannot* select or deselect any software on the **3: OE Selection** tab. This is a view-only tab. Use the **4: SW-Software Selection** tab to select and deselect software.

You can expand the list of OE software to display the following categories:

- *Required*: Software and administration tools needed to create a minimally bootable and maintainable system. Only drivers for basic hardware are included in this category. You may need to install additional drivers to use all hardware components. Software in this category is automatically selected as part of the OE and *cannot* be deselected.
- *Recommended*: Software bundles that HP recommends you install because it fulfills software dependencies, if any exist. Software in this category is

automatically selected as part of the OE. You can, however, manually deselect the bundles before you install or update your system.

- *Optional*: Any software bundles in this category that match software currently installed on the target system will automatically be selected by default. You can manually select or deselect these bundles before you install or update your system.

2. Press the Spacebar to select the OE you want to update; then select **n** (next) to confirm your selection and proceed to the Software Selection tab.

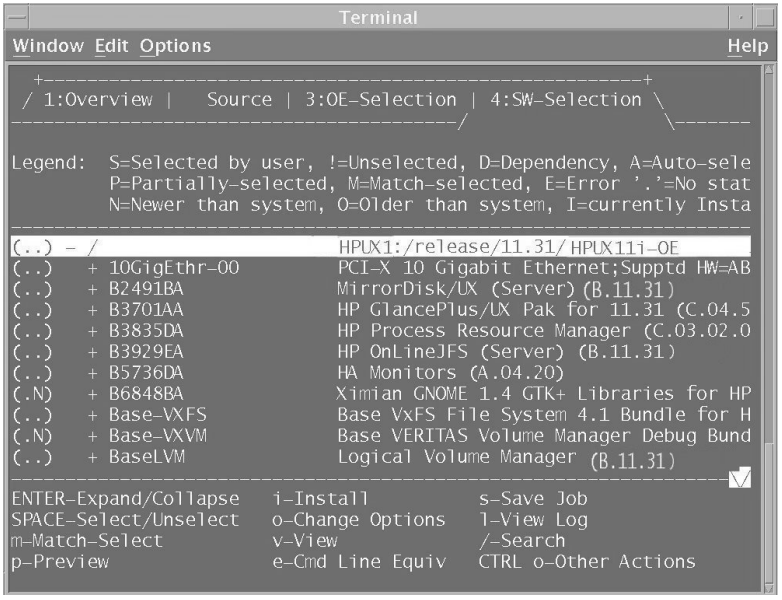
   The system displays the message: `Working...Loading *temporary* update tools that do not affect the running system and will be removed when the OE update is finished.`

Step 4: Select Software

The Software Selection tab appears. The Software Selection tab displays the software contents of the OE you selected on the OE Selection tab. On this tab you can adjust the software contents you want to include within the OE.

You can select or deselect optional software or deselect recommended software you do not want to update. Deselecting recommended software will deselect standalone software, network and storage drivers, and recommended software that is common to all operating environments.

Figure 6-5 Software Selection Tab



CAUTION: HP recommends that you do **not** deselect recommended software bundles or remove them from your system unless you know for certain that the software contained in these bundles is not required for your operating environment.

If you deselect recommended software during the update, the old version of the software you deselected will remain on your system. The old version may or may not be compatible with the newly updated HP-UX 11i v3 operating system. In addition, software may have unstated dependencies. Deselecting software may prevent products with dependencies on the software you deselected from functioning correctly.

1. Use the spacebar to select or deselect software from the list.

   The flag `M` (Match) appears when software has been matched to software currently installed on your system. The flag `P`(Partial) may appear if you select only a component of a software object or if such components are automatically selected due to dependencies.

   The software products in each category have an associated flag that is displayed in the left-hand column and are described below:

   - `S` is selected by the user.
   - `!` is unselected by the user
   - `D` is a dependency
   - `A` is automatically selected
   - `P` is partially selected
   - `M` is selected because it matches software installed on your system
   - `E` an error has occurred when selecting this item
   - `.` has no status; is not selected or installed
   - `N` is newer than the software on the system
   - `O` is older than the software on the system
   - `I` is currently installed on the system.

2. After selecting the software you wish to install, type **p** (preview) to preview the actions that will occur for the update without modifying the system.

   The output window appears and begins displaying messages beginning with: `Analyzing software to be installed`.

Step 5: Analysis (Preview)

In this step, the update-ux TUI analyzes the software you have selected.

The Analysis window displays status information about the analysis process. If the preview shows problems these will be displayed in the Analysis window.

When the analysis is complete press **Enter** to return to the Software Selection tab and start the actual update process (see "Step 6: Update" (page 90)).

Figure 6-6 Analysis Dialog

1. If you started a preview session, the preview stops after the analysis. Press **Enter** to return to the Software Selection tab.
2. After returning to the Software Selection tab, type **l** (log) to view the log file, which presents a view of detailed install information.
3. Review any errors, warnings, or notes. Warnings are simply informational. If there are any errors, they will need to be resolved before the update can continue.

Step 6: Update

In this step, the system proceeds with the actual update. At the Software Selection tab type **i** (install) to start the update process. After the update has started, the system will typically execute a reboot.

Step 7: Verify Update

After your system has completed its reboot, you will be prompted to change media when needed. Use the following steps to verify that the update completed successfully:

1. Verify that no errors were encountered before the update began by viewing the contents of the log file: `/var/adm/sw/update-ux.log`. You should see output similar to the following:

```
          Command entered: update-ux -s
          depot_server:/var/11iv3/update_depot SWM HPUX11i-OE
NOTE:     Output is logged to '/var/adm/sw/update-ux.log'
        * Obtaining some information from the source depot.
          cp /usr/lbin/swagent /var/adm/sw/tmp/update-ux
          compress /var/adm/sw/tmp/update-ux/swagent
          uncompress /var/adm/sw/tmp/update-ux/swagent.Z
          chmod +x /var/adm/sw/tmp/update-ux/swagent
        * Copying an SD agent from the source depot
```

```
/usr/sbin/swagentd -k
/usr/sbin/swagentd -r
/usr/sbin/swcopy -s depot_server:/var/11iv3/update_depot
-x logfile=/var/adm/sw/tmp/update-ux/swcopy.log
-x autoselect_dependencies=false -x enforce_dependencies=false
-x mount_all_filesystems=false -x register_new_depot=false
-x uncompress_files=true -x reinstall=true SW-DIST.SD-AGENT @
/var/adm/sw/tmp/update-ux/SWDIST.depot
/usr/sbin/swagentd -k
/usr/sbin/swagentd -r
rm -f /var/adm/sw/tmp/update-ux/orig_swagent.log
rm -f /var/adm/sw/tmp/update-ux/tmp_swagent.log
/usr/sbin/swagentd -k.
```

2. Verify that all appropriate software was updated successfully by viewing the contents of the logfile: `/var/opt/swm/swm.log`.

   You may view the contents of the `swm.log` interactively by typing the following command:

   ```
   swm job -i
   ```

   The system displays a log screen that displays contents of the log file `/var/opt/swm/swm.log`.

Figure 6-7 Log Screen

This log screen provides multiple ways of viewing the information recorded in the log file. You can filter out the messages by verbosity levels, using the action keys at the bottom of the screen.

Table 6-3 "Log Files Generated During Update" lists the log files that are generated during an update:

Table 6-3 Log Files Generated During Update

Log File	Description
/var/opt/swm/swm.log	This log file contains the output from the software selection, analysis and installation phases of the software update. In addition, this log file includes output from all control scripts that run during the update. The swm.log file is the primary log file that you should reference for the results of the update process.
/var/adm/sw/update-ux.log	This log file contains the output from the update-ux script. The update-ux script ensures that the right tools are installed before performing the update.
/var/adm/sw/swagent.log	This log file contains the detailed output from the software installation, including control scripts that run during the update. Please note that the swm.log file is a superset of the information found in the swagent.log file.
/var/adm/sw/swagentd.log /var/adm/sw/swconfig.log /var/adm/sw/swinstall.log /var/adm/sw/swmodify.log /var/adm/sw/swreg.log /var/adm/sw/swremove.log /var/adm/sw/swverify.log	These are log files for individual commands that run during the update. Success or failure and output from these commands is recorded in the swm.log. Unless directed by a message in another log file, there is no need to refer to these log files.

Updating to HP-UX 11i v3 Using the Command Line Interface

Use the following syntax to run the update-ux command:

update-ux -s *source_location* [-?] [-i] [-p] [-v] [-f *selection_file*] [-x *option=value*] [*sw_spec...*]

Table 6-4 Update-UX Commands

Update-UX Command	Description
-s *source_location*	Specifies the source containing the new software depot. Possible locations are a local directory, a mounted DVD containing a depot, or a remote system-and-depot combination. All paths used in the *source_location* must be absolute paths. If *source_location* is a remote system and depot combination, specify the remote system first, followed by the absolute path to the remote depot, separated by a colon with no spaces; for example: swperf:/var/spool/sw
-?	Prints the usage statement.
-p	Previews an update task by running the session through the analysis phase only.

Table 6-4 Update-UX Commands *(continued)*

Update-UX Command	Description
`-v`	Turns on verbose output to `stdout`.
`-f selection_file`	Reads the list of software selections from *`selection_file`* instead of (or in addition to) the command line. This option enables you to select and update optional software or to deselect recommended software.
`-x option=value`	Specifies `-x` options to be applied during the update. For a typical update, no `-x` options are required. For information on `-x` options, refer to the `swm` (1M) manpage or the *Software Distributor Administration Guide*.

`sw_spec`	Software selections support the same syntax as the `swinstall` command plus the syntax described in the selection syntax section below. The following syntax is supported for *`sw_spec`*:
	`bundle``[,`*`version`*`]`
	`product``[.`*`subproduct`*`][.`*`fileset`*`][,`*`version`*`] !`*`selection`*
	`[`*`bundle`*`]/[%match]` *`pattern-matching-expression`*
	where *`version`* can be:
	`[,r` *`op revision`*`][,a` *`op arch`*`][,v` *`op vendor`*`]`
	`[,c` *`op category`*`] [,q=`*`qualifier`*`][,l=`*`location`*`]`
	`[,fr` *`op revision`*`][,fa` *`op arch`*`]`
	where *`op`* can be:
	`=, ==, >=, <=, <, >, or !=`
	The = (equals) relational operator lets you specify selections with the shell wildcard and pattern-matching-expressions:
	`[ ], *, ?`
	The syntax `!`*`selection`* causes that selection to be deselected even if it was listed on the command line as part of other selections.

NOTE: Make sure to read "Supported Update Paths to HP-UX 11i v3" (page 32) to ensure that you are updating your system from a supported update path.

Adding and Removing Operating Environments From the Command Line

An Operating Environment (OE) represents a specific HP-UX release that can be installed on a system.

To update to HP-UX 11i v3 and include a specific HP-UX 11i v3 OE, you need to specify the OE name in the `update-ux` command. For example, to update to HP-UX 11i v3 and install the HP-UX 11i v3 Base OE, insert the HP-UX 11i v3 DVD in the local drive mounted at `/dvdrom`. As root, enter:

```
/usr/sbin/update-ux -s /dvdrom HPUX11i-BOE
```

NOTE: Make sure you install all *new* optional software included in the OE collection that you want at the same time that you do your update.

Updating Optional Software From the Command Line

To update to HP-UX 11i v3 and specify additional optional software bundles on the command line, follow these steps:

1. If you want to install additional optional software included with the HP-UX 11i v3 Base OE collection, enter:

   ```
   /usr/sbin/update-ux -s /dvdrom HPUX11i-BOE
   optional_software_bundle_name
   ```

2. Complete any configuration for HP software explained in the *HP-UX 11i v3 Release Notes* available on the Instant Information DVD and at http://docs.hp.com/en/oshpux11iv3.html

Post-Update Tasks

Task 1: Configuring OE Applications

After updating to an HP-UX 11i v3 Operating Environment (OE), some OE products need post-installation configuration to make them functional. This need may be indicated by a message logged in `/var/opt/swm/swm.log`.

Refer to each product's installation instructions for details. The location of OE product documentation is listed in the *HP-UX 11i v3 Release Notes*, available on the Instant Information DVD and at the HP Technical Documentation website:

http://docs.hp.com

Task 2: Migrating to the Agile Mass Storage Stack (Optional)

In HP-UX 11i v3, there are two types of DSFs for mass storage: legacy DSFs and persistent DSFs. Both can be used to access a given mass storage device independently and can coexist on a given system. The new mass storage stack for HP-UX 11i v3 is intended to supersede the existing mass storage stack. However, in HP-UX 11i v3 they can exist in parallel. Existing legacy DSFs will continue to work as before; they are completely backward compatible, and will not be affected by any persistent DSFs on the same server.

When you update from HP-UX 11i v2 to 11i v3, existing legacy DSFs are retained, and persistent DSFs will be created. Configuration files are not updated, so system devices will continue to use the existing legacy DSFs.

You may choose to migrate to the new agile mass storage stack or you can continue to use the legacy mass storage stack. If you want to use the new features of the agile mass storage stack and are not affected by existing limitations, you may want to migrate to the new mass storage stack.

For more information on the new mass storage stack and to migrate from the legacy view to the agile view refer to the white paper called, *The Next Generation Mass Storage*

Stack: HP-UX 11i v3 and the white paper called *HP-UX 11i v3 Persistent DSF Migration Guide* at

http://docs.hp.com/

The Next Step

Continue with the Chapter 7: “Installing HP Applications and Patches” (page 97).

7 Installing HP Applications and Patches

This chapter describes how to install HP applications from the Application Software DVD, and provides references for patching and patch management. Before you begin, make sure you have already completed installing or updating HP-UX.

What You Will Find in This Chapter

- "Installing HP-UX Applications " (page 97)
  - "Tips for Installing or Updating HP Applications" (page 97)
  - "Installing HP-UX Applications from the DVD" (page 98)
- "HP-UX Patching and Patch Management" (page 99)
  - "Standard HP-UX Patch Bundles" (page 99)
  - "Individual HP-UX Patches" (page 100)
  - "HP-UX Software Assistant" (page 100)
- "Reduce Downtime Using Dynamic Root Disk" (page 101)

Installing HP-UX Applications

Your HP-UX 11i v3 media kit contains the HP-UX Application Software DVD. The Application Software DVD has optional development tools and system management software that you can choose to install new or update the existing software on your system.

Tips for Installing or Updating HP Applications

Here are some tips for installing or updating HP applications:

- The HP-UX Application Software DVD has an ASCII file called `TABLE_OF_CONTENTS` that lists all software products delivered with the Application Software DVD. You can view this ASCII file with `vi`, `emacs`, or any other text editor.

  You can also find the complete list of applications included in the HP-UX 11i v3 release on the HP Software Releases & Media site:

  http://www.hp.com/softwarereleases/releases-media2/index.html (Navigate to **Current HP-UX update releases** or **Prior HP-UX update releases**, then navigate to **HP-UX New/Updated product list** for the appropriate release date.)

- To minimize the number of required reboots for installation of applications and patches you can use the same `swinstall` session.
- For HP applications, documentation exists that explains how to install and use an application. The documents may include release notes, readme files, CD and DVD

booklets, white papers, and guides. Refer to the Instant Information DVD or go to the HP Technical Documentation website:

http://docs.hp.com

Installing HP-UX Applications from the DVD

Before you begin, review Appendix A (page 105) for any installation issues that apply to your system.

Required Media

Have the HP-UX 11i v3 Application Software DVD ready from the HP-UX 11i v3 media kit.

You must boot HP-UX 11i v3 to install HP-UX application software products. Use the following procedure to install products from the Application Software DVD:

1. Insert the Application Software DVD in the DVD drive.
2. Mount the Application Software DVD.

   To install software from the Application Software DVD, you must mount the DVD as a file system that HP-UX 11i v3 can access:

   a. Determine the DVD device name.

   Use the `ioscan -funC disk` command to list disk devices, including the DVD devices.

   b. Create a mount point for the Application Software DVD, if one does not yet exist.

   The mount point is a directory that HP-UX uses as an access point for the DVD. Often a `/dvdrom` directory is used. If this directory does not exist, create it using the `mkdir /dvdrom` command.

   c. Use the `mount` command to mount the DVD.

   Using the `mount` command, specify the DVD device name and mount point. For example, the following command mounts the `/dev/dsk/c1t0d0` device as the `/dvdrom` directory:

   `mount /dev/dsk/c1t0d0 /dvdrom`

   Refer to the *mount*(1M) manpage for details.

3. To determine which products and versions are on your system, use the `swlist` command:

   `/usr/sbin/swlist -l product`

4. To install software from the Application Software DVD, use the `swinstall` command:

   The following example uses `swinstall` to install software from the source mounted at `/dvdrom`:

   `swinstall -i -s /dvdrom`

   Refer to the *swinstall*(1M) manpage for details. The `swinstall` program presents an interface for selecting and installing software from the DVD.

5. Unmount and eject the Application Software DVD.

   You must unmount the DVD before you can eject it from the DVD drive. The DVD is automatically unmounted whenever the server reboots. Use the `umount` command to unmount the DVD. For example, `umount /dvdrom` unmounts the `/dvdrom` file system. Refer to the *umount* (1M) manpage for details.

NOTE: After you install or update HP-UX 11i v3, the latest critical patches that shipped with the media are installed on your system. Other recommended critical or required patches may have become available after the initial release of the media. On a regular basis go to the HP IT Resource Center for any new, recommended critical patches: http://itrc.hp.com

HP-UX Patching and Patch Management

HP releases patches to deliver incremental updates to your system. Patches are best known for delivering defect fixes, but also deliver new functionality and features, enable new hardware, and update firmware. You can use HP-UX patches to update HP-UX software without having to completely reinstall your system application.

Hewlett-Packard provides several methods to patch HP-UX systems:

- "Standard HP-UX Patch Bundles" (page 99)
- "Individual HP-UX Patches" (page 100)
- "HP-UX Software Assistant" (page 100)

Standard HP-UX Patch Bundles

The HP-UX OE media provides standard HP-UX patch bundles for HP-UX core file sets and applications, plus diagnostic products. Standard patch bundles are collections of patches that have been thoroughly tested together. These bundles enable new hardware, fix known defects, and provide diagnostics tools. In some cases, a patch bundle may deliver new software functionality. All bundle software is cumulative and replaces completely any previous bundle release for the same operating system (OS) release.

For descriptions of the standard HP-UX patch bundles (including Hardware Enablement, Quality Pack, and Feature Enablement), see the *HP-UX 11i Version 3 Release Notes*. In

addition to being delivered on the OE media, the standard HP-UX patch bundles are available at the HP IT Resource Center website at http://itrc.hp.com

Documentation The *Patch Management User Guide for HP-UX 11.x Systems* provides information and procedures on how to acquire and install standard HP-UX patch bundles. You can find the document at http://www.docs.hp.com/en/oshpux11iv3.html (navigate to **Patch Management**).

Individual HP-UX Patches

Individual HP-UX patches comprise the Standard HP-UX patch bundles. The individual patches and patch bundles are available from the Patch Database on the HP IT Resource Center website at http://itrc.hp.com

At times, you may find it necessary to acquire and install individual patches, for example, based on known patch IDs, software functionality, reactive patching, and security issues.

HP-UX Software Assistant

HP-UX Software Assistant (SWA) is a tool that consolidates and simplifies patch management and security bulletin management on HP-UX systems. SWA combines the versatility and power of the HP IT Resource Center (ITRC) Patch Assessment and Security Patch Check (SPC) utilities, and is the HP-recommended utility to use to maintain currency with HP-published security bulletins for HP-UX software.

SWA can perform a number of checks, including applicable security bulletins and installed patches with critical warnings. Once an analysis has been performed, you can use SWA to download any recommended patches or patch bundles and create a depot ready for installation.

New for HP-UX 11i releases as of January 2007, the SWA tool's bundle name is `SwAssistant` and its product number is `B6834AA`. SWA is delivered as a recommended (default-installed) product in all OEs.

The HP-UX Software Assistant website at https://www.hp.com/go/swa provides a product overview, download links, documentation links, and installation instructions.

Documentation The following SWA documents are available at http://www.docs.hp.com/en/oshpux11iv3.html (navigate to **Patch Management**):

- The *HP-UX Software Assistant Release Notes* provides the features and functionality of the latest release, and known problems.
- The *HP-UX Software Assistant System Administration Guide* provides an introduction to the tool, how to use it, how to use the reporting, and troubleshooting.

Reduce Downtime Using Dynamic Root Disk

With the HP-UX system administration toolset, Dynamic Root Disk (DRD), you can clone an HP-UX system image to an inactive disk. Then you can:

- perform system maintenance on the clone while your HP-UX 11i system is online
- update **from** an older version of HP-UX 11i v3 (initial release, Update 1, Update 2 or Update 3) **to** HP-UX 11i v3 Update 4
- quickly re-boot during off hours once the desired changes have been made
- utilize the clone for system recovery, if needed
- rehost the clone on another system for testing or provisioning purposes (on VMs or blades utilizing Virtual Connect; LVM only)

The bundle name is `DynRootDisk`. The product name is DRD. Administrators can use DRD to reduce downtime for system maintenance by creating an inactive clone of the booted system, then applying patches and products to the clone. The modified clone can then be booted at a convenient time. DRD supports both HP Logical Volume Manager (LVM) and Veritas (VxVM) root volumes except where specifically noted above, and runs on both HP-UX 11i v2 and v3.

The HP-UX Dynamic Root Disk website at http://docs.hp.com/en/DRD provides a product overview, download links, documentation links, and installation instructions.

NOTE: Rehosting capabilities for HP-UX 11i v2 are different than for those of HP-UX 11i v3. For information, see the *Dynamic Root Disk System Administrator's Guide for HP-UX 11i v2, 11i v3*, available at the above website.

8 Verifying System Install or Update

This chapter provides steps to verify that your system is ready and back in production. Before you begin, make sure you have already completed either cold-installing or updating to HP-UX 11i v3.

What You Will Find in This Chapter

- "Verifying the HP-UX Cold-Install or Update" (page 103)
- "Backing Up the System" (page 104)
- "The Next Step" (page 104)

TIP: This chapter provides verification information for the HP-UX cold-install and update applications. To verify other vendor applications, refer to the appropriate vendor documentation.

Verifying the HP-UX Cold-Install or Update

To verify that HP-UX 11i v3 was installed or updated successfully, use the Software Distributor commands `swlist` and `swverify`, as described in this section. In addition, you can view the results of your update in the log file `/var/opt/swm/swm.log`. Refer to "Step 6: Update" (page 90) for more information.

TIP: For help with these commands, refer to the *swlist*(1M) and *swverify*(1M) manpages, and the *Software Distributor Administration Guide*, which is available on the Instant Information DVD or the HP Technical Documentation website:

http://docs.hp.com/en/oshpux11iv3.html

Task 1: Listing all Software Installed on Your System

1. List the bundles and products installed on your system:

   `/usr/sbin/swlist -l bundle -l product > /tmp/`*`software_list`*

2. Check the list to see that it contains the bundles and products you wish to have installed on your system.
3. For a cold-install, you may want to compare the output of the `swlist` command above with the contents of the HP-UX 11i v3 Operating Environment DVD and the Application Software DVD. To see the contents of a DVD, issue the following command:

   `/usr/sbin/swlist -l bundle -l product -s /dvdrom > /tmp/`*`dvdcontent`*

Task 2: Verifying the Installed Software

You can verify that all software was successfully installed on your system by typing the following command:

```
/usr/sbin/swverify \*
```

The message "Verification succeeded" should be displayed on the console at the end of the operation. Further messages from the verification process can be found in the log files: `/var/adm/sw/swverify.log` and `/var/adm/sw/swagent.log`

Backing Up the System

Now that you have a solid system configuration, you need to back it up. This provides you with a stable configuration that you can use to rebuild the system, if necessary.

For more information, see "Backing Up Your System" (page 56).

The Next Step

Now that you have installed or updated your system and have all the HP applications that you need, you may want to configure additional hardware or file systems. You can find many configuration tasks in the *HP-UX System Administrator's Guide* (http://www.docs.hp.com/en/oshpux11iv3.html#System%20Administration).

A Known Problems and Troubleshooting

This appendix lists known problems and troubleshooting steps for install and update.

What You Will Find in This Appendix

- "Messages: Errors, Warnings, and Notes" (page 105)
- "Known Install and Update Problems" (page 105)
- "Uninstalling HP-UX 11i v3" (page 124)

Messages: Errors, Warnings, and Notes

While the HP-UX 11i v3 install progresses, messages are displayed relating to the progress being entered into the log file. These messages usually refer to normal behavior. The `ERROR`, `WARNING`, and `NOTE` messages, however, have the following significance:

`ERROR` Indicates a serious problem, usually requiring action from you so that the installation can proceed.

`WARNING` Indicates something out of the ordinary, but *not* fatal. The warning *may* require action from you.

`NOTE` Indicates useful information you should take note of, but *not* fatal. The note does not require action from you.

Known Install and Update Problems

Table A-1 describes problems currently known to occur while installing and/or updating to the HP-UX 11i v3 release.

IMPORTANT: Review the *HP-UX 11i v3 Read Before Installing or Updating* DVD booklet. It describes information about known install and update problems that was not available when this guide was published.

Table A-1 Known Install and Update Problems

Problem	Description/Action
Spanish Help Not Available for HP-UX Auditing and Security Attributes Configuration Product	In the Spanish version of the HP-UX Auditing and Security Attributes Configuration product, the Help is displayed in French. **What To Do** Currently, there is no workaround. The fix will be available in the next release of the product on the HP Software Depot website: http://software.hp.com
In Help for HP-UX Disks and File Systems, "Resize the VxFS File System" Displays Incorrect Information	In Help for HP-UX Disks and File Systems, the "Resize the VxFS File System" page incorrectly displays the help for "Expand the File System." This error occurs in all the supported languages. **What To Do** Currently, there is no workaround. The fix will be available in the next release of the HP-UX Disks and File Systems product on the HP Software Depot website: http://software.hp.com
Clicking Veritas Enterprise Administrator Link on the System Management Homepage May Result in VEA Abort and Core Dump	Starting with the September 2008 OEUR, clicking the Veritas Enterprise Administrator (VEA) link on the System Management Homepage may result in VEA aborting and dumping core. VEA 5.0 is bundled with JRE 1.5.0.2, which doesn't support large base page sizes (64K base page size). Because of this, the problem occurs when HP-UX has been configured to use large base pages. This problem will also occur when running VEA on an unpatched Integrity VM host, as the Integrity VM default configuration includes large base page size for performance optimization. **What To Do** Install the patch, `PHCO_37694`, which will update the version of JRE in VEA 5.0 without requiring a reboot. For availability of the patch, check the HP IT Resource Center site: http://itrc.hp.com. For additional information about adjusting base page sizes, see the "Tunable Base Page Size" white paper: http://docs.hp.com/en/14670/ENW-TBPS-TW.pdf

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action

Removal of SWA Generates Harmless Message in `swagent.log`	During removal of HP-UX Software Assistant (SWA) from your system, the unconfigure stage may generate a message in the `swagent.log` that there was a problem with connecting to the HP SIM server:
	`There was an error in CLIClientLogon constructor`
	`  There was a problem connecting to the HP Systems Insight Manager server. Make sure that:`
	`  1. Your username has been added to HP Systems Insight Manager.`
	`  2. Your username and password, if specified, are correctly spelled.`
	`  3. HP Systems Insight Manager is running.`
	`  4. You used '--' for any long options and double quotes if your username includes a domain.`
	`  Example: <commandname> --user "mydomain\myusername" --pass mypassword`
	What To Do
	You can safely ignore this message. It is caused by a defect in the unconfigure script and will appear on any system where HP SIM is inactive or is not installed. If HP SIM is active, the message will not appear.

Update from HP-UX 11i v2 to HP-UX 11i v3 March 2009 Will Result In Generation Of A Core File From `sfd`	During update from HP-UX 11i v2 to HP-UX 11i v3 March 2009, the currently running `sfd` daemon will be stopped and restarted. This is done in order to start the `sfd` daemon freshly from the newly delivered executable. Because the update is still going on and the OS is still 11i v2, the starting of `sfd` out of the new binary delivered for 11i v3 results in generation of a core file. **What To Do** There are no other known impacts because of this problem. No workaround exists at this time. The `sfd` daemon will start without any problem once the update is complete and the system reboots. If required, the core file can be safely removed from the system.
After Installation, Applications Calling `getpw*()` or `getgr*()` Will Dump Core in libc During a Certain Window	After cold installation, the *pwgrd*(1M) daemon creates the file `/var/spool/pwgr/status` with zero size and initializes it with status information. There is a small window between file creation and initialization in which file size is zero. If any application calls `getpw*()` or `getgr*()` APIs during this window, they will dump core in `libc`. **What To Do** Install `PHCO_37620` to fix this problem. For availability of the patch, check the HP IT Resource Center site: http://itrc.hp.com. The other workaround is to rerun the applications/daemons that have failed by dumping core, or reboot the system.

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action
VxVM Not Supported On Systems With USB Devices At This Time	A message such as the following may be logged into `dmesg` during VxVM operations: `"WARNING: VxVM vxio V-5-3-946 vol_disk_change_iopolicy: Public region policy specific open failed for c0t2d0 0x5000020 ret = 0xffffffff"` These messages are logged when internal or external USB devices are detected on the system and when the minor number of the USB devices collide with any of the other storage disks connected to the system. This results in the corresponding disks (disks that have same minor number as that of the USB devices) not being able to be opened by VxVM. In the above WARNING message, "`open failed for cXtXdX`" indicates which disks will not function well under VxVM. **What To Do** No workaround exists for this problem at this time. HP and Symantec are investigating possible solutions. Although the disks might work, the behavior is unknown and not supported. VxVM is not supported on systems that have USB devices connected at this point in time. This co-existence issue is tracked by `QXCR1000834043`. VxVM will be supported on systems that have USB devices once the fix for `QXCR1000834043` is available.

Update from Previous OEUR to HP-UX 11i v3 September 2008 and Beyond May Log Harmless Message on Console Regarding `VRTSob`	While updating from a previous OEUR to the HP-UX 11i v3 September 2008 OEUR and beyond, the following messages may be logged onto the console:
	`*[902] Running "preinstall" script for fileset "VRTSob.VEAS-FILESET". - [902] kill: 1944: The specified process does not exist.`
	`*[367] Running "preinstall" script for fileset "VRTSob.VEAS-FILESET succeeded with 1 warning.`
	`*[1394] Installing fileset "VRTSob.VEAS-FILESET,r=3.3.837.0" (841 of 1062).`
	What To Do
	This is a harmless message. Installation is not affected. `VRTSob` will start without any problem once the update is complete.

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action
Update from Previous OEUR to HP-UX 11i v3 September 2008 and Beyond May Log Harmless Message on Console Regarding `VRTSat`	While updating from a previous OEUR to the HP-UX 11i v3 September 2008 OEUR and beyond, the following message may be logged onto the console: `/sbin/rc[14]: /sbin/rc2.d/S700vxatd:  not found.` **What To Do** This is a harmless message. Installation is not affected. Veritas Authentication Service (`VRTSat`) will start without any problem once the update is complete.
SSL Certificates Generated While Cold-Installing HP WBEM Services A.02.07.04 May Not Be Accepted by WBEM Service Clients	While cold-installing HP WBEM Services, the SSL certificates are generated with short host names. These certificates cannot be used by the WBEM Service clients. The following warning message is logged in the `swagent.log` file: `Note: Cannot find the fully-qualified domain name (FQDN) for this system, SSL certificates for WBEM Services are created with the short hostname. Correct this either by editing the /etc/hosts file or by making the appropriate DNS registration. If not corrected, the created certificates may not be acceptable to the WBEMService clients that expect a FQDN in the common name field of the SSL certificate. After the hostname(FQDN) is configured, run /opt/wbem/sbin/gen_wbem_certs to create SSL certificates for WBEMServices. The existing certificates /etc/opt/hp/sslshare/cert.pem and /etc/opt/hp/sslshare/file.pem will be moved to /etc/opt/hp/sslshare/cert.pem.bak and /etc/opt/hp/sslshare/file.pem.bak respectively.` **What To Do** As a workaround, after configuring the host name, run the `/opt/wbem/sbin/gen_wbem_certs` utility to create SSL certificates for HP WBEM Services.

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action

Update to HP-UX 11i v3 Generates Harmless Warning Messages in the Install Log File	When updating to HP-UX 11i v3 September 2008 from HP-UX 11i v1, 11i v2 or 11i v3, one or both of the following warning messages may be logged in to the install log file:
	`"EMS-Core.EMS-WRAPPER-COM". WARNING: [1296] Encountered a message of unknown priority. - [902] cron may not be running - call your system administrator`
	`warning: commands will be executed using /usr/bin/sh * [367] Running "configure" script for fileset "EMS-Core.EMS-WRAPPER-COM". succeeded with 1 warning.`
	The message "`cron may not be running`" will be logged if the `cron` daemon has not been running during the update.
	The warning "`commands will be executed using /usr/bin/sh`" will occur if the default login shell is defined as anything other than POSIX shell `/usr/bin/sh`.
	This is simply a warning from `cron` that the POSIX shell will be used to execute commands in the `crontab` file. If the login shell is set to `/usr/bin/sh` in the `/etc/passwd` file, then this error will not be logged.
	What To Do
	Both these warning messages can be safely ignored.

Audit Events and Audit System Calls Tabs in "Auditing and Security Attributes Configuration" May Not Show Any Events	The **Audit Events** tab and **Audit System Calls** tab in the "Auditing and Security Attributes Configuration" tool in HP SMH may not show any Events, if there is a duplicate custom event defined in the `/etc/audit/audit_site.conf` file. This issue has been seen since the tool was first released in September 2007. **What To Do** To confirm if the table in the Events tab does not contain any rows because of the duplicate entry, execute the command `/usr/sbin/audevent -l` on the command prompt. If you see an error message similar to `Rename event alias 'XXXXXXXX' (line YYY) in /etc/audit/audit_site.conf; the name has already been used` manually edit the file to remove the duplicate definition mentioned on line number `YYY`.

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action
HFS Filesystem Block Size Must Be Greater Than or Equal to System Base Page Size	The HP-UX 11i v3 September 2008 release includes the option to tune the system base page size to values larger than its 4 KB default. Integrity Virtual Machines always uses this feature to tune the system base page size in the Platform Manager to 64 KB. HFS filesystems will fail to mount when the filesystem block size is less than the system base page size. **What To Do** If you are performing an update, and plan to use a non-default base page size. Replace each HFS filesystem with a VxFS filesystem. For each existing HFS filesystem, create a new VxFS filesystem and copy the contents of the HFS filesystem to the VxFS filesystem. HP does not recommend using HFS filesystems on systems where the base page size will be tuned to a non-default value. While HFS filesystems can be configured to work in this environment, VxFS administration is much simpler than HFS administration with non-default base page sizes. During a cold-install, configure all physical filesystems as VxFS filesystems. For information about the new tunable that controls the size of a system base page, see "Tunable Base Page Size" in the *HP-UX 11i Version 3 September 2008 Release Notes* (http://www.docs.hp.com/en/oshpux11iv3.html#Release%20Notes).
Update to VxVM 5.0 Generates Harmless Warning in `rc.log`	After update to VxVM 5.0, `/sbin/rc1.d/S092vxvm-startup start` outputs the following warning to `rc.log`: `VxVM vxvm-startup WARNING V-5-2-0 CVM protocol version in use is older. The system is running at CVM protocol version 60 while the highest available is 70. You need to run 'vxdctl upgrade' to use the newest disk group version and the features it supports.` **What To Do** You can safely ignore this harmless message. The message is reported after an upgrade to indicate that a higher disk layout version is available.
Installing or Updating to HP-UX 11i v3 September 2008 and Beyond with VxVM 5.0 Generates Spurious Error Message	After installing or updating to HP-UX 11i v3 September 2008 and beyond with VxVM 5.0, the following error message is logged on the console: `VxVM vxconfigd ERROR V-5-1-12826 /etc/vx/uuid/bin/osuuid list: invalid guid:` **What To Do** You can safely ignore this error message.

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action
Updating from HP-UX 11i v2 to HP-UX 11i v3 September 2008 and Beyond Generates Spurious Error Message	When updating from HP-UX 11i v2 to HP-UX 11i v3 September 2008 and beyond, the following error message is logged to the console on the final reboot: `VxVM sysboot INFO V-5-2-3390 Starting restore daemon... VxVM vxdmpadm ERROR V-5-1-684 IPC failure: Configuration daemon is not accessible VxVM sysboot INFO V-5-2-3811 Starting in boot mode...` **What To Do** You can safely ignore this error message. The update and reboot will be successful, and there will be no functionality impact.

Cold-install Fails in Integrity VM Guest	Due to a limitation on the length of the pathname to backing store volumes, cold-installing HP-UX 11i v3 fails in an Integrity VM guest when using host VxVM volumes as the guest's backing store. The install fails with the following error:
	`NOTICE: VxVM vxdmp V-5-0-34 added disk array OTHER_DISKS, datype = OTHER_DISKS`
	`VxVM vxdisk ERROR V-5-1-5433 Device disk1_p2: init failed: Device path not valid`
	`* smapi listener returned "ACTION_FAILURE" for message "CREATE_GROUP"`
	`The configuration process has incurred an error, would you like to push a shell for debugging purposes? (y/[n]):`
	The issue will be fixed in a subsequent release of VxVM.
	What To Do
	Restrict the length of the pathname to a backing store volume. If using VxVM volumes as backing store, the combined number of characters in the volume group name AND the volume name must not exceed 9.
	For all backing stores (including LVM or raw disk), the full pathname to the backing store or volume must not exceed 23 characters.

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action

VxVM Volumes Cannot Be Configured as Dump Devices on PA-RISC Systems	When using `crashconf`, errors like this one may be seen:
	`# crashconf -r /dev/vx/dsk/DUMPDG/dumpvol`
	`/dev/vx/dsk/DUMPDG/dumpvol: error: unsupported disk layout`
	Additionally, after updating PA-RISC systems that previously used older VxVM or HP-UX versions configured with VxVM dump devices, errors like this one may be seen in `syslog`:
	`Apr 10 11:13:33 ptstn5 vmunix: ERROR: dump device 2:0x1 cannot be used and will be ignored:`
	What To Do
	Do not use VxVM for dump devices. Any other disk or volume type can be used. `crashconf -r` *`non-vxvm disk`* can be run to replace the default `swapvol` (though not properly configured). `crashconf -s` can be run to update the `krs` to use the new *`non-vxvm disk`* as the default dump device instead of `swapvol`.
	A patch to fix this problem, `PHKL_38236`, is available at HP IT Resource Center site: http://itrc.hp.com.

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action
HP Serviceguard Storage Management Suite May Be Incompatible with Upgrade of OE	When you purchase an HP Serviceguard Storage Management Suite (SG SMS) Operating Environment (OE) bundle, the SG SMS software is provided on one DVD and the HP-UX OE (Mission Critical - MCOE, Data Center - DC-OE, or High Availability - HA-OE) is provided on a separate DVD. The software provided on the SG SMS DVD relies on products and filesets that are provided on the OE DVD, including HP Serviceguard and the Veritas Storage Foundation products. Each SG SMS version relies on specific versions of HP Serviceguard and the Veritas Storage Foundation products that can change with new OE releases. The software on the SG SMS DVD is installed using `swinstall`. If an HP-UX OE is installed on your system and you attempt to install a SG SMS version that is not supported with the versions of Serviceguard and Veritas Storage Foundation included with the OE, `swinstall` will detect the incompatible software and the installation will fail. The software on the OE DVD is installed using `update-ux`. If a SG SMS bundle is installed on your system and you attempt to install or upgrade to an OE version that includes Serviceguard and Veritas Storage Foundation versions that are not supported with the SG SMS bundle, `update-ux` will not detect the incompatible software. The installation will complete, but the Serviceguard cluster will not start, or you will not be able to access the Veritas volumes. `update-ux` does not check for software dependencies. **What To Do** For information on Serviceguard and Veritas Storage Foundation versions that are supported with various SG SMS bundles, see the "Compatibility Information and Installation Requirements" section in the *HP Serviceguard Storage Management Suite Release Notes* for your SG SMS product. The SG SMS documentation is available at http://docs.hp.com (navigate to **High Availability**, then to **HP Serviceguard Storage Management Suite**).

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action

Warning Message During Update from HP-UX 11i v2 with OnlineJFS 4.1 to HP-UX 11i v3 with OnlineJFS 5.0	When OnLineJFS 5.0 (`B3929FB`) is selected during an update from 11i v2 OnlineJFS 4.1 to 11i v3 with OnlineJFS 5.0 (`B3929FB`), the following selection time warning from `update-ux` may be seen:
	`WARNING: The following was found while selecting software:`
	`- There are new revisions of SW available in the source that would update SW already installed on the system. The newer revisions are not selected for installation. This could leave the incompatible old revision of SW on the system. The affected SW is:`
	`- OnlineJFS.VXFS41-AD-RN,r=B.11.31 replaces OnlineJFS01.VXFS41-AD-RN,r=4.1.004`
	What To Do
	This warning can be safely ignored. The update will complete successfully despite this warning. For complete installation instructions, see also "VxVM and VxFS Installation with Update-UX" (page 130).

Cannot Access `/.secure/etc/*` Error Message	Updating from the HP-UX 11i v2 release to the HP-UX 11i v3 release may cause the following error to appear in the `swagent.log`: `cp: cannot access /.secure/etc/*: No such file or directory` **What To Do** You can safely ignore this message.

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action

Unloading Device Driver for Critical Resource May Cause Next System Boot to Fail	If you attempt to dynamically unload an I/O interface device driver assigned to a system critical resource, the unload does not succeed. However, the driver is marked as unused and it is removed from the kernel configuration for the next system boot. For example:
	`# kcmodule drivername=unused`
	`ERROR: Unload of the module 'drivername' failed.`
	`- Critical Usages detected for the module.`
	`- More details can be found in /var/adm/cra.log.`
	`NOTE: The requested changes could not be applied to the currently running system, for the following reasons:`
	`- The module 'drivername' cannot support the requested operation.`
	`* The requested changes have been saved, and will take effect at next boot.`
	What To Do
	Before rebooting your system, run `kcmodule -D` to see what modules will be removed at the next boot. For example:
	`Module State Cause Notes`
	`drivername (now) loaded best loadable, unloadable`
	`(next boot) unused`
	If the driver controls a system critical resource, run `kconfig -H` to discard all changes pending for the next boot. For example:
	`# kconfig -H`
	`* All changes being held for next boot have been discarded.`
	`# kcmodule -D`
	`NOTE: There are no module state changes being held for next boot.`

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action

Warning Messages on Reboot of HP-UX 11i v3 System	Upon reboot of your HP-UX 11i v3 system, the following warning messages may appear in the `/etc/rc.log` file:
	`*Finish containment subsystem configuration Output from "/sbin/rc2.d/S480sec_late_init start":`
	`setfilexsec: warning: Ignored the entry for file "/opt/ids/lbin/idssysdsp":`
	`No such file or directory setfilexsec: warning: Ignored the entry for file "/opt/ids/lbin/idscor":`
	`No such file or directory setfilexsec: warning: Ignored the entry for file "/opt/ids/bin/idsagent":`
	`No such file or directory setfilexsec: warning: Ignored the entry for file "/opt/ids/lbin/updaterc":`
	`No such file or directory ERROR CODE 1 "/sbin/rc2.d/S480sec_late_init start" FAILED`
	What To Do
	You can safely ignore these warning messages as these messages do not affect the functionality of HIDS or other products installed on the system. However, these warning messages may continue to appear in `/etc/rc.log` file upon every reboot of the system when the product is installed and then later removed. If you want to stop receiving these warning messages, execute the following set of commands to clear entries related to HIDS from the containment product's configuration file (`/etc/priv-apps/all-apps`):
	`/usr/sbin/setfilexsec -D /opt/ids/lbin/idssysdsp`
	`/usr/sbin/setfilexsec -D /opt/ids/lbin/idscor`
	`/usr/sbin/setfilexsec -D /opt/ids/bin/idsagent`
	`/usr/sbin/setfilexsec -D /opt/ids/lbin/updaterc`

Configuring vPar with Low Base Memory Results in System Hang or Slow Performance	Configuring a vPar with a low amount of base memory can result in system hang or lead to slow system performance. **What To Do** Configure vPars with enough base memory as per the below guidelines: • If there is 1 GB to 8 GB total memory assigned to the Virtual Partition: make sure the minimum base memory is 1/2 of total memory. • If there is 8 GB to 16 GB total memory assigned to the Virtual Partition: make sure the minimum base memory is 4 GB. • If there is over 16 GB total memory assigned to the Virtual Partition: make sure the minimum base memory is 1/4 of the total memory.

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action
Online Diagnostics are No Longer Started by Default	With the HP-UX 11i v3 March 2008 release, Online Diagnostics are no longer started by default. Traditionally, HP Instant Support Enterprise Edition (ISEE) depends on Online Diagnostics (EMS listener) for event detection, however, if it is not started and you notice anomalies in ISEE operation especially with regard to which events are submitted, you must consult the *ISEE Installation and Configuration Guide*. **What To Do** To check which version of diagnostics is running, run the following command: `sfmconfig -w -e` The preceding command switches the diagnostics mode to "EMS". In this mode, EMS Hardware Monitors are enabled and `SysFaultMgmt` does not monitor any devices. If the results show that only System Fault Manager is running without Online Diagnostics (EMS listener) on your HP-UX device, and anomalies exist in ISEE operation especially with regard to which events are submitted, please consult the *ISEE Installation and Configuration Guide* for additional information and instructions at www.hp.com/learn/isee Note: As of the HP-UX 11i v3 September 2008 OEUR, ISEE is no longer included in the OEs. See the *HP-UX 11i Version 3 September 2008 Release Notes* for further information.

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action
HP Service Control Manager (SCM) Not Supported on HP-UX 11i v3	The HP Service Control Manager (HP SCM) is not supported on HP-UX 11i v3. If your system is running SCM, you must migrate to HP System Insight Manager (HP SIM) version 4.2 BEFORE updating to HP-UX 11i v3; otherwise the update may fail. **What To Do** Remove HP SCM before updating to HP-UX 11i v3. If you are updating your system to HP-UX 11i v3 and HP SCM is installed on your current system and you do not want to run it in the future, you must remove the HP SCM product before you update to HP-UX 11i v3. Uninstall HP Servicecontrol Manager using the following command: `swremove -x enforce_dependencies=false ID` where ID is the product or bundle ID as shown in the following example syntax: `swremove -x enforce_dependencies=false B8339BA` Remove the old product sub-directories by executing the following command: `rm -fr /opt/mx /etc/opt/mx` You can also remove the database for Service Control Manager, mysql, by executing the following command: `swremove mysql` You may also choose to migrate HP SCM version 3.0 to HP SIM version 4.2 before updating to HP-UX 11i v3. You must be running HP SCM version 3.0 to perform this update. If you are running an earlier version you will need to update HP SCM to version 3.0 before updating to HP SIM version 4.2. For more information on migrating from HP SCM to HP SIM version 4.2 please see the *HP Systems Insight Manager 5.1 Installation and User Guide*.

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action
Secure Path Not Supported on HP-UX 11i v3	Secure Path is not supported on HP-UX 11i v3. If your system is running Secure Path, upon update to HP-UX 11i v3, a migration script will execute and perform the following actions: • Uninstall the HP StorageWorks Secure Path driver for Active-Passive disk arrays • Uninstall the HP StorageWorks Secure Path driver for Active-Active disk arrays • Map the pseudo DSFs provided to LUNs by Secure Path (for Active-Passive disk arrays) to their corresponding LUN WWN • Map the virtual aliases provided to the LUNs by Secure Path 3.0F SP2 (for Active-Active disk arrays) to their corresponding HP-UX 11i v3 disk device special file • Update the `/etc/fstab` with HP-UX 11i v3 disk device special file by replacing the virtual aliases provided by Secure Path 3.0F SP2 (Active-Active disk arrays), but the filesystems will not be automatically mounted • Update all the Secure Path virtual aliases with the new style device special files If the virtual aliases provided by Secure Path 3.0F SP2 (Active-Active disk arrays) are used in the `/etc/fstab` file, the entries are automatically replaced with the corresponding new style dsfs. Only active-active disk arrays supported by the version of Secure Path (active/active) installed on the system will be migrated. For example, if Secure Path for HP-UX 3.0F is installed, EVA-GL (active/active) LUNs cannot be migrated because EVA-GL is supported only from Secure Path for HP-UX 3.0F SP1. **What To Do** After the cold-install or update to HP-UX 11i v3 is complete, manually mount the file systems. For more information, see the white paper called, *Migrating from HP StorageWorks Secure Path for Active-Active Disk Arrays to Native Multipathing in HP-UX 11i v3* available at http://docs.hp.com

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action

JavaOOB Installation Errors	Updating from an earlier HP-UX 11i v2 release to a later HP–UX 11i v3 release may cause the following errors to appear in the `console log`, `dmesg.log` and `syslog` from the Java Out-of-Box (JavaOOB) installation:
	`ERROR: The proposed values for nfile (4097) and maxfiles_lim (4096)do not meet t he constraint of (nfile >= (2 * maxfiles_lim)).`
	`ERROR: The stored value (4097) for the tunable 'nfile' is not valid. The system will use the default value instead.`
	What To Do
	You can safely ignore this message.

NIS+ Not Supported on HP-UX 11i v3	The NIS+ product is not supported on HP-UX 11i v3. If a system is running NIS+, you must migrate to LDAP BEFORE updating to HP-UX 11i v3; otherwise the update may fail. The NIS+ to LDAP-UX migration tool uses NIS+ commands and utilities for migration. Since the NIS+ commands and utilities will not be available on HP-UX 11i v3, the migration tools will not run on a system that has been updated to HP-UX 11i v3. **What To Do** Migrate NIS+ servers and clients to LDAP before updating to HP-UX 11i v3.

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action

NFS*MAN Filesets Produce `swverify` Errors During Install/Update or Removal	After an HP-UX 11i v3 install/update, the `swverify` command may report that one or more of the following `ONCplus.NFS` manpage files is missing:
	`/usr/share/man/man1m.Z/portmap.1m`
	`/usr/share/man/man1m.Z/umount_nfs.1`
	`/usr/share/man/ja_JP.eucJP/man1m.Z/umount_nfs.1m`
	`/usr/share/man/ja_JP.SJIS/man1m.Z/umount_nfs.1m`
	The hard links to the affected manpages were incorrectly removed by the install/update process.
	What To Do
	As superuser, recreate the missing links by executing the following commands, as needed:
	`# cd /usr/share/man/man1m.Z`
	`# ln rpcbind.1m portmap.1m`
	`# ln mount_nfs.1m umount_nfs.1m`
	`# cd /usr/share/man/ja_JP.eucJP/man1m.Z`
	`# ln mount_nfs.1m umount_nfs.1m`
	`# cd /usr/share/man/ja_JP.eucJP`
	`# ln mount_nfs.1m umount_nfs.1m`

Third-Party Product Installation Scripts Fail to Launch	For some third-party product installation scripts, `dtksh` is required for scripts to launch license-acceptance dialogs for Mozilla. **What To Do** Either install CDE to enable the script to run as expected, or execute `/opt/mozilla/mozilla` and manually accept the Mozilla license.
Warning Message When Performing `swcopy`, `swlist`, or `swverify`	If you are on an HP-UX 11i v1 system and perform `swcopy`, `swlist`, or `swverify` on a depot containing HP-UX 11i v2 or HP-UX 11i v3 software, you may encounter the following warning message: `WARNING: Ignoring duplicate information for the keyword "dynamic_module" at line.` **What To Do** For `swlist` or `swverify` on HP–UX 11i v1, you can safely ignore this message. For `swcopy` on HP–UX 11i v1, install patch `PHCO_28848` (or a superseding patch) on the HP–UX 11i v1 system, then re-run the `swcopy` command with "`-x reinstall=true`".

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action
Updating to HP-UX 11i v3 from HP-UX 11i v2 with VxFS 5.0	If VxFS 5.0 has been used to create file systems with disk layout version 7, those disks will not be readable by the VxFS 4.1 for HP-UX 11i v3. **What To Do** If you plan to update to 11i v3 with VxFS 4.1, then, before updating to 11i v3, copy data from your DLV 7 file systems and onto file systems created at layout version 5 or 6. This step is not required if you plan to update to 11i v3 with VxFS 5.0, because the 11i v3 VxFS 5.0 can read DLV 7 file systems.
Updating to HP-UX 11i v3 from HP-UX 11i v2 with VxFS 4.1	If you have created any VxFS file system with disk layout version 2 or version 3, these file systems cannot be mounted under VxFS 4.1 on HP-UX 11i v3. **What To Do** Use the `vxfsconvert` command to upgrade the disk layout to version 4 before upgrading to VxFS 4.1 on HP-UX 11i v3. See the *Veritas 4.1 Installation Guide* for more information on VxFS 4.1.

Table A-1 Known Install and Update Problems *(continued)*

Problem	Description/Action
Third-Party Storage	If third-party (non-HP) storage will be connected to your HP-UX 11i v3 system, HP recommends that you contact your third-party storage vendor to determine the compatibility of the storage with HP-UX 11i v3. Check with your third-party storage vendor for information about any prerequisites and limitations with the storage on HP-UX 11i v3.

`/dev/random` or `/dev/urandom` Errors During Update	When updating your system to HP-UX 11i v3, you may encounter the following error message in the `/var/opt/swm/swm.log` file:
	`*Running "/var/adm/sw/pre_update/RNG-DKRN.100".`
	`ERROR: The /dev/random or /dev/urandom device special files may not be in use during`
	`update-ux. Use the fuser(1M) command to identify these processes, then terminate them.`
	`ERROR: The script "/var/adm/sw/pre_update/RNG-DKRN.100" returned a value of "1" (ERROR)`
	`*Running "/var/adm/sw/pre_update/RNG-DKRN.100" failed with 2 errors`
	What To Do
	Run `fuser /dev/random or fuser /dev/urandom` to retrieve a list of process IDs that are using the special device files. Use the process ID along with the `ps` command to determine what processes are using the special device files.
	If you find `mxdtf`, `mxdomainmgr`, or `mxinventory` as part of these processes, then run `/opt/mx/bin/mxstop` to stop all HP SIM activities before updating to HP-UX 11i v3.
	If you find `smbd` as part of these processes, then run `/sbin/init.d/sambastop` to stop all CIFS/Samba server processes before updating to HP-UX 11i v3.
	If you find named as part of these processes, then run `/sbin/init.d/named stop` and `/usr/sbin/rndc stop` to stop all DNS/BIND server processes before updating to HP-UX 11i v3.
	If you find `sshd` as part of these processes, then run `/sbin/init.d/secsh stop` to stop all HP Secure Shell server processes before updating to HP-UX 11i v3.

Uninstalling HP-UX 11i v3

If you cannot resolve problems after installing HP-UX 11i v3, then you may want to uninstall it. The process depends upon the install process you followed:

- If you previously created an operating system recovery image with either `make_net_recovery` or `make_tape_recovery` using Ignite-UX, boot the system from that media to return the OS and any archived applications to the

previous release. Refer to the *Ignite-UX Administration Guide* available on the Instant Information DVD and at http://docs.hp.com/en/oshpux11iv3.html#Ignite-UX.

- If you do not use Ignite-UX or do not have a current operating system recovery image:
  - If your applications and data are on a separate disk from the OS, cold-install the previous OS. Doing this ensures a clean OS installation, removing all previous upgrade and patch information.
  - If applications, data, or both are on the same volume with the OS, boot from the previously-saved system recovery tape to return to a previous OS. These expert recovery processes are in the *Ignite-UX Administration Guide*.

To determine which applications are on the system and where they are located, use `swlist`. If you only need to remove applications or patches from the system, use `swremove`. Refer to the *Software Distributor Administration Guide* for details.

B Controlling Memory Utilization of VxFS 4.1

This appendix discusses the effect of two VxFS tunables, `vx_ninode` and `vxfs_bc_bufhwm`, on system memory consumption and provides guidelines on setting them for machines with relatively low RAM.

What You Will Find in This Appendix

- "Introduction" (page 127)
- "Controlling the inode Cache" (page 127)
- "Controlling the Buffer Cache" (page 128)
- "Conclusion" (page 128)

Introduction

VxFS 4.1 caches objects in memory to improve performance. Most of the memory consumed by VxFS is used to cache inodes (in the inode cache) and metadata (in the buffer cache). The sizes of these caches and the behavior of VxFS are controlled by a set of tunables. You can tailor the performance of VxFS to meet a variety of usage scenarios while taking into account variations in machine configurations *via* the use of these tunables.

The default settings of these tunables are meant to provide good performance for typical deployment configurations. However, these default values can result in the VxFS driver consuming more memory, especially when the file systems are under heavy file system load. For machines low on RAM, these tunables may need to be manually turned down depending on the expected use of the machine and the performance required of the file system.

VxFS 4.1 exposes two global tunables, `vx_ninode` and `vxfs_bc_bufhwm`, that control the size of the inode cache and buffer cache, respectively, and thereby affect system memory consumption by the file system driver.

This appendix discusses when and why the sizes of the inode and buffer caches need to be tuned down from their default values in certain configurations. The following sections describe these tunables in detail as well as the effects of changing their default values.

Controlling the inode Cache

As a matter of course, VxFS file systems allocate and free up inodes as required by the load on the file system. VxFS caches these inodes for better performance (faster lookups). In general, larger inode caches help file systems perform better for file server and web server loads. The global (static) tunable `vx_ninode` represents the maximum possible size of the VxFS inode cache.

Normally, the size of the inode cache is decided (auto-tuned) at boot time by VxFS depending on the amount of physical memory in the machine, provided that the value of `vx_ninode` is set to zero (default).

However, systems low on RAM (having typically 1.5 GB/CPU) may not require a large inode cache if file systems are not exposed to file server and web server loads, or when file system performance is not critical. HP recommends that you set a minimum value as specified below based on the memory configuration.

Physical Memory or Kernel Available Memory	VxFS inode Cache (number of inodes)
1.5 GB	16384
2 GB	32768
3 GB	65536
> 3 GB	131072

NOTE: Default values are set at boot time and the values are not automatically adjusted when memory is added, removed or migrated at run time.

Controlling the Buffer Cache

VxFS 4.1 implements a private buffer cache used exclusively for metadata. The allocations made for this buffer cache are not static but grow and shrink during system usage, depending on the load on the file system. The global (static) tunable `vxfs_bc_bufhwm` represents the maximum possible size of the VxFS buffer cache.

The maximum size of the metadata buffer cache is set (auto-tuned) at boot time based on system memory size, provided that the value of `vxfs_bc_bufhwm` is set to zero (default).

Like with the tunable `vx_ninode`, a large metadata buffer cache can help improve file system performance, especially during metadata-intensive loads (stat, create, remove, link, lookup operations).

Systems low on RAM (having typically 1.5 GB/CPU) may not need a large metadata buffer cache if the file system load is not metadata-intensive or when performance is not critical. In such circumstances, the value of `vxfs_bc_bufhwm` can be manually tuned down, subject to a minimum of 6 MB.

Conclusion

VxFS uses in-memory caches for objects that result in improved file system performance. The cache sizes are controlled by tunables that are auto-tuned at boot time by the driver. For situations where the auto-tuned values are not optimal, you can set these tunables.

C Installing VxFS and VxVM

Previous HP-UX 11i v3 Operating Environment Update Releases (OEURs) included the 4.1 version of VxFS and VxVM. Starting with the September 2008 OEUR, the following software is included:

- VxFS 4.1 (`Base-VXFS` bundle) — required installed in all OEs
- OnlineJFS 4.1 (`B3929EA` bundle) — recommended (default) installed in DC-OE, VSE-OE, and HA-OE
- VxFS 5.0 (`Base-VxFS-50` bundle) — optional in all OEs
- OnlineJFS 5.0 (`B3929FB` bundle) — optional in DC-OE, VSE-OE, and HA-OE
- VxVM 5.0 (`Base-VxVM-50` bundle) — optional in all OEs

Logical Volume Manager (LVM) is also present in all OEs and is recommended software (installed by default). This means that, starting in the September 2008 OEUR, the default install selection for all systems is VxFS 4.1 + LVM.

NOTE:

VxFS 4.1 Considerations If your system has the minimum amount of memory, you may need to manually set VxFS tunables for optimal performance *after* cold-installing or updating to HP-UX 11i v3. For more information about these tunables, see Appendix B (page 127).

If VxFS 5.0 has been used to create file systems with disk layout version 7, those disks will not be readable by the VxFS 4.1 that ships with HP-UX 11i v3. If you plan to update to 11i v3 with VxFS 4.1, before updating to HP-UX 11i v3, copy data from your DLV 7 file systems and onto file systems created at layout version 5 or 6. This step is not required if you plan to update to HP-UX 11i v3 with VxFS 5.0, because the 11i v3 VxFS 5.0 can read DLV 7 file systems.

NOTE:

VxVM 4.1 Replaced by VxVM 5.0 Starting with the September 2008 release, VxVM 4.1 is not included in the OEUR or AR media. It has been replaced by VxVM 5.0. However, in the September 2008 OEUR and beyond, VxVM is not installed by default as it was in past OEURs. Explicit selection of VxVM 5.0 in the Ignite-UX tool is required to install VxVM.

All configurations, including VxVM installations, are achievable with proper selections in the Ignite-UX tool. The following sections describe the steps required to get to each possible configuration.

- "VxVM and VxFS Installation through Cold-Install" (page 130)
- "VxVM and VxFS Installation with Update-UX" (page 130)

VxVM and VxFS Installation through Cold-Install

The following sections describe the steps required for each **supported** cold-install configuration.

LVM with VxFS 4.1 Configuration

A default cold-install will result in an LVM system with VxFS 4.1 and OnlineJFS 4.1 installed (OnlineJFS will NOT be installed with the BOE). No additional selections in the IUX user interface (UI) are needed to cold-install this configuration.

LVM with VxFS 5.0 Configuration

To cold-install LVM with VxFS 5.0, manually select VxFS 5.0 and/or OnlineJFS 5.0 for install in the Ignite-UX user interface's **Software** tab.

VxVM 5.0 with VxFS 5.0 Configuration

To cold-install VxVM with VxFS, manually select the **VxVM with VxFS** environment (in the Ignite-UX **Basic** tab) and manually select **VxVM 5.0** in the **Software** tab for install. You MUST do both (explicitly select the VxVM "environment" and the VxVM 5.0 bundle [`Base-VxVM-50`]) or Ignite-UX will fail with this error:

```
ERROR: The system has VxVM configured, but the VERITAS Volume
Manager software was not selected for loading. You are required
to load it in order for the installation to succeed. Use the
software selection screen to mark the appropriate VxVM software
for loading.
```

VxVM 4.1 with VxFS 4.1 Configuration

If a cold-install to a VxVM 4.1–based system is needed, please consult the following white paper (at http://docs.hp.com) for detailed instructions:

Installation of VxFS and VxVM 4.1 on HP-UX 11i v3 September 2008 Operating Environment Update Release

VxVM and VxFS Installation with Update-UX

All of the configurations described in "VxVM and VxFS Installation through Cold-Install" (page 130) can also be achieved during OEUR updates using `update-ux`. Just like cold-install, the update process will default to VxFS 4.1 with LVM. To install the VxFS 5.0 and VxVM 5.0 configurations noted in the previous section, simply make sure that the desired bundles are selected in `update-ux`. To do so, use the following command:

```
update-ux -s depot_path Base-VxFS-50 Base-VxVM-50
```

NOTE:

VxVM Considerations As with other installs, updates to September 2008 OEUR and beyond will *not* install VxVM by default. You must explicitly select VxVM 5.0 in the `update-ux` command line to install VxVM.

If VxVM is not selected for installation during update and VxVM is currently not in use, update scripts built into the September 2008 OEUR and beyond will automatically remove any unused older versions of VxVM from your system.

NOTE:

Unsupported System Configurations Many different configurations are selectable at update time, but not all of them would result in supported system configurations. For this reason, pre-update scripts built into the September 2008 OEUR and beyond will block certain updates before they start, to prevent updates into unstable configurations. The scripts will print an error message, and the error can be resolved by restarting the update with different software selections.

For example, if an existing 11i v3 system has VxFS 4.1 and VxVM 4.1 configured, and an update is attempted to the September 2008 OEUR and beyond with only VxFS 5.0 selected, the OEUR scripts will block the update. This is done because this update would result in a system that has VxFS 5.0 and VxVM 4.1 installed—an unsupported combination of versions. To resolve this error, simply restart the update after selecting both VxFS 5.0 and VxVM 5.0 in `update-ux`, so that the update results in matching 11i v3 versions of VxFS and VxVM.

Other unsupported paths will also be blocked by the scripts of September 2008 OEUR and beyond, and can be resolved in similar ways. (The other most common blocked update occurs when 11i v2 VxVM is in use on a system but you forget to select VxVM 5.0 at update time.)

Updates from HP-UX 11i v2 with OnlineJFS 4.1 to HP-UX 11i v3 with OnlineJFS 5.0

To update HP-UX 11i v2 systems that are already installed with HP-UX 11i v2 OnlineJFS 4.1 and that you want to update to HP-UX 11i v3 with OnlineJFS 5.0 (`B3929FB`), you must deselect HP-UX 11i v3 OnLineJFS 4.1 (`B3929EA`) during the update. This can be done in the `update-ux` command line as follows:

```
update-ux -s source_location !B3929EA B3929FB
```

The `!B3929EA` entry on the command line ensures that 11i v3 OnLineJFS 4.1 is not installed from the depot during the update.

NOTE: **Known Problem:** When OnLineJFS 5.0 (`B3929FB`) is selected in the scenario above, the following selection time warning from update-ux may be seen:

```
WARNING: The following was found while selecting software:

- There are new revisions of SW available in the source that
would update SW already installed on the system. The newer
revisions are not selected for installation. This could leave
the incompatible old revision of SW on the system. The affected
SW is:

- OnlineJFS.VXFS41-AD-RN,r=B.11.31 replaces
OnlineJFS01.VXFS41-AD-RN,r=4.1.004
```

What To Do

This warning can be safely ignored. The update will complete successfully despite this warning. This known problem is also listed in Appendix A (page 105).

Updates to HP-UX 11i v3 with VxVM 4.1

To update HP-UX 11i v2 systems and remain at VxVM 4.1 in HP-UX 11i v3, please consult this white paper (at http://docs.hp.com) for detailed instructions:

Installation of VxFS and VxVM 4.1 on HP-UX 11i v3 September 2008 Operating Environment Update Release

To update 11i v3 systems that are already installed with VxVM 4.1 and that you want to remain at VxVM 4.1 after the update, simply use the default upgrade selections. The September 2008 OEUR and beyond will select only VxFS 4.1 by default, so that the previously installed version of 11i v3 VxVM 4.1 will remain unchanged (and still usable) on the system.

D HP-UX 11i v3 Software Bundles Contained in the New OEs

This appendix describes the software bundles included in the HP-UX 11i v3 new Operating Environments.

Starting with the March 2008 release, HP presents a set of new Operating Environments for HP-UX 11i v3. These new Operating Environments provide a richer set of products and improved choices over the original set of HP-UX 11i OEs. For more information on the new OEs, see "New HP-UX 11i v3 Operating Environments" (page 18). For more information on transition, mapping, etc. from original OEs to new OEs, see www.hp.com/go/tov3oes

What You Will Find in This Appendix

- "HP-UX 11i v3 Operating Environment Install/Update Structure" (page 133)
- "Required Software" (page 135)
- "Recommended Software" (page 137)
- "Optional Software" (page 142)

HP-UX 11i v3 Operating Environment Install/Update Structure

HP-UX 11i v3 has an Operating Environment (OE) structure that provides more flexibility in managing the products you wish to install and update on your system. The OE structure for HP-UX 11i v3 separates software components into several product categories, making it easier and more reliable for you to incrementally update your system with OE software components.

Table D-1 HP-UX 11i v3 Software Product Categories

Software Category	Description
CompilersDevelopment	Compilers and Development Tools
CoreOS	Core HP-UX Functionality
Desktop	Desktop Environments
DisksFileSystems	File Systems and Volume Mgmt
Drivers	I/O Drivers
HighAvailability	High Availability
InetServices	Internet Services
Internet	Internet Software Tools
Interoperability	Computing Interoperability Tools
Java	Java Tools and Utilities

Table D-1 HP-UX 11i v3 Software Product Categories *(continued)*

Software Category	Description
Localization	Localization
Manuals	HP-UX Manual Pages
Migration	Migration to HP-UX Tools
Networking	Networking Infrastructure
Obsolescence	Product Obsolescence
Performance	Performance Tools
Security	Security Tools
SecurityChoices	Security Level Choices
SupportTools	Diagnostic and Support Tools
SystemManagement	System Management Tools
Utilities	Miscellaneous Utilities
OE Optional	All optional bundles in the OE
OE Recommended	All recommended bundles in the OE
OE Required	All required bundles in the OE

Each of the above product categories contain software bundles that are further separated into the following install types:

- **Required**: Software and administration tools needed to create a minimally bootable and maintainable system. Only the drivers for basic hardware are included in this category. You may need to install additional drivers to use all hardware components. Software in this category *cannot* be deselected. This software is "always-installed."

  For a list of the required software bundles, see "Required Software" (page 135).

- **Recommended**: Software bundles that HP recommends you install because they fulfill software dependencies, if any exist. You can, however, manually de-select the bundles before you install or update your system. This software is "default-installed."

  To install a minimal operating system configuration (base OS) you can deselect the recommended bundles. Only the minimal core OS will be installed on your system when you deselect the recommended bundles. You can use the *OE*

Recommended software product category (listed in Table D-1 (page 133)) to select or deselect all recommended items.

CAUTION: HP recommends that you do **not** deselect recommended software bundles or remove them from your system unless you know for certain that the software contained in these bundles is not required for your operating environment. In addition, software may have unstated dependencies. Deselecting software may prevent products with dependencies on the software you deselected from functioning correctly.

For a list of the recommended software bundles, see "Recommended Software" (page 137).

- **Optional**: Software bundles that are not installed or updated by default. You must manually select these bundles before you install or update your system. This software is "selectable."

  For a list of the optional software bundles, see "Optional Software" (page 142).

Required Software

The software listed in Table D-2 is required and always installed with the HP-UX 11i v3 operating system.

Table D-2 Required Software

Description	Bundle Name
HP-UX 11i v3 operating system software. This is a core bundle.	HPUXMinRuntime
Contains user tools and utilities used for administering HP-UX, including: • nPartition Provider (nParProvider) • Disks and File Systems (FileSystems) • HP-UX Accounts for Users and Groups (UserGroups) • HP-UX Security Attributes Configuration (SecConfig) • Common System Management Enablers (SysMgmtBASE) • Network Configuration (NetworkConf) • OpenSSL (OpenSSL) • HP-UX Peripheral Device Tool (PeriphDev) • Judy Libraries (Judy) • HP-UX Update-UX (UPDATE-UX) • HP WBEM Services for HP-UX (WBEMSvcs) • HP-UX Kernel Configuration (Casey) • Event Monitoring Service (EventMonitoring) • HP-UX Printers and Plotters Tool (PrinterConfig) • Instant Capacity (iCAP) for HP Integrity and HP 9000 Servers (B9073BA) • HP Instant Capacity Manager (iCAPMgr) • Event Monitor GUI (EMSWeb) • HP-UX Software Distributor (SW-DIST) • HP-UX Software Manager (SWM) • Minimal HP-UX Software Assistant Functionality (SwaMin)	SysMgmtMin
Logical Volume Manager	BaseLVM
CommonIO	CommonIO
HP-UX Mail Server	HPUX-MailServer
HP-UX 11i v3 Online Diagnostics	OnlineDiag
System Fault Management	SysFaultMgmt
HP-UX nPartition Configuration Commands	NParCmds
Obsolescence Bundle **NOTE:** The Obsolescence product is required during an OE update to remove products that are obsolete or unsupported in HP-UX 11i v3. The Obsolescence product is automatically removed from the system at the end of the OE update process. The Obsolescence product is not needed and not installed during a cold-install.	OBSOLESCENCE
ONCplus	ONCplus
Provider Utils	ProviderSvcsBase

Table D-2 Required Software *(continued)*

Description	Bundle Name
Prop Plus	SysMgmtPlus
Base VxFS 4.1	Base-VXFS
Patch Bundles	
Feature Enablement Patch Bundle (FEATURE11i)	FEATURE11i
Hardware Enablement Patch Bundle	HWEnable11i
Quality Pack Patch Bundles (QPKAPPS)	QPKAPPS
Quality Pack Patch Bundles (QPKBASE)	QPKBASE
Drivers	
10GigEthr-02	10GigEthr-02
GigEther-00	GigEther-00
GigEther-01	GigEther-01
IEther-00	IEther-00
RAID-01	RAID-01
scsiU320-00	scsiU320-00
SerialSCSI-00	SerialSCSI-00
USB-00	USB-00

Recommended Software

The software bundles listed in Table D-3 are installed or updated by default. You can deselect any of these bundles before you install or update your system; however make sure that any bundle you select or deselect does not have a dependency. For example, you may deselect a software bundle that is necessary for another program to work correctly.

CAUTION:
HP recommends that you do **not** deselect recommended software bundles or remove them from your system unless you know for certain that the software contained in these bundles is not required for your operating environment.

If you deselect recommended software during the update, the old version of the software you deselected will remain on your system. The old version may or may not be compatible with the newly updated HP-UX 11i v3 operating system. In addition, software may have unstated dependencies. Deselecting software may prevent products with dependencies on the software you deselected from functioning correctly.

Table D-3 Recommended Software

Description	Bundle Name
Contains operating system software that is required by most HP-UX users. **NOTE**: Make sure you do not deselect this bundle or remove it from your system unless you know for certain that the software contained in this bundle is not required for your operating environment.	HPUXEssential
Contains internationalization support for many languages.	HPUXLocales
HP-UX message catalogs that contain localized language message catalogs for functionality in the HPUXMinRuntime and HPUXEssential bundles.	HPUXMsgs-Jpn HPUXMsgs-Fre HPUXMsgs-Ger HPUXMsgs-Ita HPUXMsgs-Kor HPUXMsgs-SCh HPUXMsgs-Spa HPUXMsgs-Swe HPUXMsgs-TCh
HP-UX manual pages that contain language-specific manpages for functionality in the HPUXMinRuntime and HPUXEssential bundles.	HPUXMan-Eng HPUXMan-Jpn
Contains language-specific input methods, printer and terminal support, fonts and utilities.	HPUXExtns-Jpn HPUXExtns-Kor HPUXExtns-SCh HPUXExtns-TCh
HP-UX Auto Port Aggregation	J4240AA
Distributed Systems Administration Utilities	DSAUtilities
Dynamic nPartitions	DynamicNPars
Dynamic Root Disk	DynRootDisk
Firefox web browser	FIREFOX
Firefox web browser source	FIREFOXsrc
Gnome GUI Runtime Toolkit	GTK
Gnome GUI Runtime Toolkit source	GTKsrc
GTK+ Libraries	B6848BA
HP-UX Bastille Security Tool	HPUXBastille

Table D-3 Recommended Software *(continued)*

Description	Bundle Name
HP aCC_link bundle	`HP-ACC-Link`
HP Caliper	`HP-Caliper-Perf`
HP CIFS Client	`CIFS-CLIENT`
HP CIFS Server	`CIFS-SERVER`
HP FTP Server	`HPUX-FTPServer`
HP Integrity Virtual Machines (VMGuestLib)	`VMGuestLib`
HP-UX Nameserver/BIND	`HPUX-NameServer`
HP WildeBeest Debugger	`HP-WDB-DEBUGGER`
HP-UX DHCPv4 Server This is a core bundle.	`HPUX-DHCPv4`
HP-UX DHCPv6 Server This is a core bundle.	`HPUX-DHCPv6`
HP-UX NTP Server This is a core bundle.	`HPUX-NTP`
HP-UX IPv6 routing Server This is a core bundle.	`HPUX-RAMD`
HP-UX TCP Wrapper daemon This is a core bundle.	`HPUX-TCPWRAP`
HP-UX Gated and Mrouted Server This is a core bundle.	`HPUXGatedMrouted`
HP-UX IPFilter	`IPFilter`
HP-UX Secure Shell	`SecureShell`
Install-Time Security Infrastructure	`Sec00Tools`
LDAP-UX Integration	`LDAPUX`
Mozilla Application Suite	`MOZILLA`
Mozilla Source Distribution	`MOZILLAsrc`
Openview SNMP Agent	`OVsnmpAgent`
PAM Kerberos	`PAMKerberos`

Table D-3 Recommended Software *(continued)*

Description	Bundle Name
Partition Manager	ParMgr
Perl Programming Language	perl
Process Resource Manager	B3835DA
Provider Default Tools • HP-UX WBEM SCSI Provider (SCSIProvider) • Online Provider (OLOSProvider) • HP-UX WBEM LAN Provider for Ethernet Interfaces (WBEMP-LAN-00) • WBEM Provider for Fibre Channel HBAs (WBEMP-FCP) • Utilization Provider (utilProvider) • vPartition Provider (VParProvider) • HP Integrity Virtual Machines Provider (vmProvider) • HP Global Workload Manager Agent (gWLMAgent) • Serial SCSI provider (SAS-PROVIDER) • Smart Array Provider (RAIDSA-PROVIDER) • WBEM Indication Provider for IOTree subsystem (WBEMP-IOTreeIP) • HP Application Discovery Agent (AppDiscAgent) • HP-UX File System CIM Provider (WBEMP-FS) • HP-UX Kernel Providers (KERNEL-PROVIDERS) • HP-UX WBEM Direct Attached Storage Provider (DASProvider)	ProviderDefault
PRM Kernel Software	PRMKernelSW
PRM Libraries	PRMLibraries
Red Hat Directory Server	RHDirSvr
HP-UX Software Assistant	SwAssistant
HP System Management Homepage	SysMgmtWeb
Thunderbird email client	TBIRD
Thunderbird email/client source	TBIRDsrc
Tune-N-Tools	Tune-N-Tools
HP-UX Web Server Suite	
HP-UX Apache-based Web Server	hpuxwsApache
HP-UX Tomcat-based Servlet Engine	hpuxwsTomcat
HP-UX Webmin-based Admin	hpuxwsWebmin

Table D-3 Recommended Software *(continued)*

Description	Bundle Name
HP-UX XML Web Server Tools	`hpuxwsXml`
Java Bundles	
Runtime Environment (v1.6/6.0) for Java	`Java16JRE`
Java Runtime Environment Add-On (v1.6/6.0)	`Java16JREadd`
Java Development Kit (v1.6/6.0)	`Java16JDK`
Java Development Kit for HP-UX Add-On (v1.6/6.0)	`Java16JDKadd`
Runtime Environment (v1.5) for Java	`Java15JRE`
Java Runtime Environment Add-On (v1.5)	`Java15JREadd`
Java Development Kit (v1.5)	`Java15JDK`
Java Development Kit for HP-UX Add-On (v1.5)	`Java15JDKadd`
Runtime Environment (v1.4) for Java	`T1457AA`
Java Runtime Environment for HP-UX Add-On	`T1457AAaddon`
Software Development Kit/Runtime Environment (v1.4) for the Java Platform	`T1456AA`
Java SDK for HP-UX Add-On	`T1456AAaddon`
Java 2 JPI (v1.4)	`T1458AA`
Drivers	
FibrChanl-00	`FibrChanl-00`
FibrChanl-01	`FibrChanl-01`
FibrChanl-02	`FibrChanl-02`
Guest AVIO LAN software	`GuestAvioLan`
Guest AVIO Stor software	`GuestAVIOStor`
Host AVIO LAN software	`HostAvioLan`
Host AVIO Stor software	`HostAVIOStor`
VSE-OE, HA-OE and DC-OE Only	
GlancePlus Pak	`B3701AA`
High Availability (HA) Monitors	`B5736DA`
Mirrordisk/UX LT	`B2491BA`

Table D-3 Recommended Software *(continued)*

Description	Bundle Name
OnlineJFS 4.1	B3929EA
HA-OE and DC-OE Only	
Enterprise Cluster Master (ECM) Toolkit	T1909BA
HP Serviceguard	T1905CA
HP Serviceguard NFS Toolkit	B5140BA
VSE-OE and DC-OE Only	
HP Global Workload Manager Agent LTU	T2762AA
HP Virtualization Manager LTU	T2782AC
HP Capacity Advisor LTU	T2784AC
HP VSE Suite LTU	T2786AC
VMGuestSW	VMGuestSW
Workload Manager	B8843CA
Workload Manager Toolkits	WLMToolkits

Optional Software

The bundles listed in Table D-4 are *not* installed or updated by default. You must select the desired optional software bundles prior to installing or updating your system.

Table D-4 Optional Software

Description	Bundle Name
3D Graphics Development Kit (DK) and Runtime Environment (RTE) for OpenGL	Graphics
Common Desktop Environment (CDE) bundle (xxx is language variable). **NOTE:** CDE is an optional product in HP-UX 11i v3. If you require it, you must explicitly select the CDE bundle (CDE-XXX). This applies if you need dtterm, which is located in CDE. For some localization situations, dtterm is required, therefore CDE must be selected.	CDE-xxx
Cpio Enhancement	CpioCmdEnh
Dynamic System V Semaphore Tunables	DynSysVSem
FIFOENH	FifoEnh
getenv Performance Enhancement	GetenvEnh

Table D-4 Optional Software *(continued)*

Description	Bundle Name
HP-UX Host Intrusion Detection System	HPUX-HIDS
MemFS	MemFS
HP Message Passing Interface (MPI)	B6060BA
HP MLIB Mathematical Software Library	B6061AA
HP-UX Password Hash Infrastructure for HP-UX 11i v3	PHI11i3
Pax Enhancement (PAX-ENH)	PAX-ENH
HP Process Resource Manager (PRM) Web GUI Systems Insight Manager (SIM) Integration Files	PRMSIMTools
HP-UX Security Containment Extensions	ContainmentExt
HP Systems Insight Manager (HP SIM)	HPSIM-HP-UX
HP Insight Power Manager (HP IPM)	HPIPM-HP-UX
Virtual Server Environment Management Software	VSEMgmt
Virtual Server Environment Configuration Assistant	VseAssist
HP-UX Atomic Library	AtomicLib
HP-UX Auditing System Extensions	AuditExt
Ignite-UX	IGNITE
IPv6 Upgrade for HP-UX 11i v3	IPv6Upgrade
HP-UX IPsec	IPsec
HP-UX Internet Services	HPUX-SLP
HP-UX Role-based Access Control Extension	AccessControl
HP-UX Swapoff (Command)	Swapoff
Java Out-of-Box	JAVAOOB
Kerberos Client	KRB5CLIENT
Libc Enhancements	LibcEnhancement
MallocNextGen	MallocNextGen
Media Streaming Protocol	Media—Streaming
Mobile IPv4	HPUXMOBILEIPV4
HP-UX Mobile IPv6	HPUXMOBILEIP

Table D-4 Optional Software *(continued)*

Description	Bundle Name
Network Server Accelerator	NSAHTTP
Numeric User Group Name	NumericUsername
Pay per use	T2351AA
Software Package Builder	SwPkgBuilder
Security Level 10	Sec10Host
Security Level 20	Sec20MngDMZ
Security Level 30	Sec30DMZ
UmountallEnh	UmountallEnh
Base VxTools 5.0	Base-VxTools-50
VxFS 5.0	Base-VxFS-50
VxVM 5.0	Base-VxVM-50
Drivers	
10GigEthr-00	10GigEthr-00
10GigEthr-01	10GigEthr-01
HyprFabrc-00	HyprFabrc-00
IB4X-00 Driver for InfiniBand	IB4X-00
PCIMUX-00	PCIMUX-00
TERMIO-00	TERMIO-00
VSE-OE, DC-OE, and HA-OE Only	
OnlineJFS 5.0	B3929FB
VSE-OE and DC-OE Only	
HP Integrity Virtual Machines	T2767BC
HP Integrity Virtual Machines (VMGuestSW)	VMGuestSW
HP Integrity Virtual Machines (VMKernelSW)	VMKernelSW
Integrity VM Online Migration Software (OVMM)	T8718AC
HP Integrity VM Manager (VMMGR)	VMMGR
HP-UX Virtual Partitions	T1335CC

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