

Tru64 UNIX and TruCluster Software Products

Patch Kit Installation Instructions

June 2004

Product Version: Tru64 UNIX Patch Kits

This guide provides instructions for installing, removing, and working with Release Patch Kits, Customer-Specific Patch Kits (CSP), and Early Release Patch Kits (ERP) using the `dupatch` utility, which is included with HP Tru64 UNIX and TruCluster software patch kits.

The information in this guide applies to the new inclusive patch kits and the old style patch kits. Differences in actions between the two types of kits are described when applicable. See Section 1.1 for an overview of the two types of kits.

For information about individual patches and information that is specific to a patch kit, see the *Patch Summary and Release Notes* document for the kit you are installing.

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About This Manual

This manual provides instructions for installing and removing patches that are provided by Hewlett-Packard Company in its Tru64 UNIX and TruCluster software products patch kits. It also describes baselining techniques and provides other information for working with patches.

The information applies to Release Patch Kits, Customer-Specific Patch Kits (CSP), and Early Release Patch Kits (ERP) installed on Versions 4.0F and higher. The differences in dealing with the different product versions and patch-kit types are minimal; this manual alerts you to those differences during process discussions and step-by-step instructions.

For information about individual patches, see the *Patch Summary and Release Notes* document for the kit you are installing.

Audience

This manual is for those who install and remove patch kits and manage patches after they are installed.

Organization

This manual is organized as follows:

<i>Chapter 1</i>	Introduces the <code>dupatch</code> utility and describes its features.
<i>Chapter 2</i>	Provides information to be aware of when installing and removing patches.
<i>Chapter 3</i>	Describes the procedures for installing and removing patches.
<i>Chapter 4</i>	Describes the rolling upgrade process for patching a system running TruCluster Server Version 5.0A or higher while the cluster is in operation. This process is also used for upgrading to a new version of the TruCluster software software or for doing an upgrade and a patch together.
<i>Chapter 5</i>	Describes the no-roll patch process, which provides a way to apply patches to a cluster quickly in order to minimize downtime and reduce the number of reboots required.
<i>Appendix A</i>	Helps you understand the log files generated by <code>dupatch</code> .
<i>Appendix B</i>	Describes error messages you might see while installing, removing, or maintaining patches.
<i>Appendix D</i>	Provides information about using the <code>dupatch</code> command-line interface and documents the <code>dupatch(8)</code> reference page.

Related Documentation

In addition to this manual, the following documentation may be helpful in the patching process:

- The *Patch Summary and Release Notes* for the patch kit you are working with.
- *Technical Updates for Tru64 UNIX Version 5.0 and Higher Patch Kits* or *Technical Updates for Tru64 UNIX Versions 4.0F and 4.0G*, which report any information about restrictions and problems that may have been discovered since the release of these patch kits.

- *Patching Best Practice*
- *Tru64 UNIX Installation Guide*
- *Tru64 UNIX System Administration*
- *TruCluster Server Cluster Installation*
- *TruCluster Server Cluster Administration*

See *Patch Process Resources* for Web sites where you can find this documentation.

Patch Process Resources

We provide Web sites to help you with the patching process:

- To obtain the latest patch kit for your operating system and cluster go to:

<http://www.itrc.hp.com/service/patch/mainPage.do>

- To view or print patch-related documentation go to:

<http://h30097.www3.hp.com/docs/patch/>

Here you can find patch-specific technical updates, release notes for current and previous patch kits, this installation guide, and other information that can help you with the patching process.

- To view or print patch-related documentation go to:

<http://h30097.www3.hp.com/docs/>

Here you can find Tru64 UNIX documentation, TruCluster software product documentation, operating system and other technical updates, and other information to help you with your Tru64 UNIX systems.

- To visit the Tru64 UNIX homepage go to:

<http://h30097.www3.hp.com/>

- To visit our main support HP page go to:

<http://h71025.www7.hp.com/support/home/index.asp>

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The Tru64 UNIX Publications group cannot respond to system problems or technical support inquiries. Please address technical questions to your local system vendor or to the appropriate HP technical support office. Information provided with the software media explains how to send problem reports to HP.

Conventions

This guide uses the following conventions:

<i>file</i>	Italic (slanted) type indicates variable values, placeholders, and function argument names.
Ctrl/ <i>x</i>	This symbol indicates that you hold down the first named key while pressing the key or mouse button that follows the slash. In examples, this key combination is enclosed in a box (for example, Ctrl/c).
# setld	Boldface type in interactive examples indicates typed user input.
device names	Operating system versions before Version 5.0 use different names than those of Version 5.0 and higher. In general, this manual uses the Version 5.0 names. For example, where a partition name is represented by /dev/disk/dsk3g, the Version 4.0n name might be /dev/rz3g.
:	The vertical ellipsis is used in output examples to replace redundant information. This is information you would see on your terminal screen or in a log file created by dupatch, but is not particularly useful in the examples in this manual.
Glossary Terms	In the online version of this document, various terms are linked to the <i>Glossary</i> . By clicking on the term, you will be taken to its definition. You can return to the place you were reading by clicking on your browser's Back button.

Patch Process Overview

This chapter introduces you to the `dupatch` utility for installing, removing, and managing patches. See Chapter 3 for instructions on installing and removing patches from the Tru64 UNIX operating system and the TruCluster software products.

1.1 Changes to Patch Kits

Beginning with Version 5.1B Patch Kit 4, Tru64 UNIX patch kits have been modified in several important ways to ensure quality. If you have previously installed Tru64 UNIX patch kits, you will notice the following changes between the old-style kits and the new, inclusive patch kits:

- All or none installation

When you install an inclusive patch kit, you must install all patches; you can no longer select specific patches to install. By making the installation of all patches mandatory, you can patch with greater confidence that the process will be problem free.

Before a patch kit is released, it is tested on many types of systems and system configurations. This testing continues until we are assured that the patches perform the tasks they were designed for and do not introduce new problems. It is not possible to achieve this type of testing on every possible combination of individually selected patches.

- Substantially reduced installation time

The installation process for inclusive patch kits can reduce the time it takes to install the patches by as much as half from what you are used to. For large, clustered systems, the difference can be several hours faster.

- Fewer patches displayed

Because of the way these new patch kits are designed, you will see many fewer patches listed by `dupatch` during the installation process. For example, a partial listing you see will be similar to the following:

```
- Tru64_UNIX_V5.1B / Security Related Patches:
  * Patch 25001.00 - SP04 OSFACCT540

  * Patch 25002.00 - SP04 OSFADVFS540 (SSRT2275)

  * Patch 25003.00 - SP04 OSFADVFSBIN540
```

In the old-style patch kits, these three patches might have consisted of perhaps 20 individual patches being displayed. The difference is not in the content of the kits, but rather in the way the patches are packaged and installed. In this example, the SP04 identifies the patch as belonging to Patch Kit 4, the OSF. . . 540 identifies the subset the patch is included in, and the SSRT2275 indicates a type of security patch.

As with earlier kits, you can find a brief overview of all the patches (listed by patch number) in the kit's *Patch Summary and Release Notes*.

- All or none patch removal

As with the installation process, if you want to remove a patch, you must remove all of them. That is, you can no longer select individual patches for removal.

- Patches for the Worldwide Language Support (WLS) subset

Inclusive patch kits include any patches that may be required for the WLS subset. As with the TruCluster Server patches, the WLS patches are installed only if you have the WLS subset installed.

Except for the installation and removal processes, the functions provided by the `dupatch` utility generally work the same with inclusive patch kits as they do in old-style patch kits. For example, the Patch Tracking and Baselining menus remain the same and work the same in the new style kits as they do in the earlier kits.

The instructions in this manual are the same for earlier kits and for inclusive patch kits. Where the processes differ, each process is explained.

1.2 Using dupatch

All Tru64 UNIX and TruCluster software Release Patch Kits (also referred to as aggregate kits) are installed, removed, and managed using the `setld`-based `dupatch` utility, which provides you with menus that step you through the various tasks. The `dupatch` utility is also used for installing many of the Customer-Specific Patch Kits (CSP), and Early Release Patch Kits (ERP). Although the examples and descriptions provided in this manual, in general, refer to Release Patch Kits, the information is similar for CSPs and ERPs that install using `dupatch`.

The `dupatch` utility is interactive, but you can also run it from the command line using command options. For information about using the command-line interface, see Appendix D, which includes the `dupatch(8)` reference page.

For clustered systems running TruCluster Server Version 5.0A or higher, `dupatch` is run in conjunction with the rolling upgrade (see Chapter 4) or no-roll (see Chapter 5) procedures.

With `dupatch`, you can perform the following actions:

- Install and remove patches.
- View patch tracking and management information.
- Track current `dupatch`-installed patches and Customer-Specific patches.
- Establish a baseline for systems that had manually installed system files placed on them.
- Ensure the correct handling of customized system configuration files so that customizations are not lost (for example, `conf.c`). These files are also referred to as system-protected files (`.new.`).
- Validate patch applicability to existing system files (collision detection).
- View the patch-specific documentation.

Because `dupatch` manages patch interdependencies, direct `setld` installations (`setld -l`) and deinstallations (`setld -d`) are disabled.

Many of the `dupatch` operations generate log files that record the step-by-step procedures performed during the operation. For information about log files see Appendix A.

1.3 Patch Applicability

Patch applicability to the existing system files is done on a file-by-file basis for each patch. This ensures that the installation of a patch will not degrade or crash the system. The installation of a patch is blocked if any system files to be replaced by a patch are not valid predecessors of the patch files.

Patch applicability also enables consistency checking and reporting for the installation of Tru64 UNIX and TruCluster software patches.

In cases where a patch is blocked, informative messages are provided to assist you in determining how to proceed. Appendix B lists common error messages and suggested corrective actions.

The installation of a patch is blocked if any of the following conditions exist:

- The underlying software product subset is not installed — for example, if the applicable Tru64 UNIX or TruCluster software release subset is not installed.
- The `setld` inventory is inconsistent with the existing system files. This occurs when an operating system or TruCluster software `setld` subset is installed and individual operating system files that are part of that subset are moved, deleted, or replaced.
- If any of the existing system files (files that are targeted to be updated by a patch) have changed and cannot be related to previous versions of the patch. This ensures that operating system files that change due to other explicit system administrator action (for example, layered product patches or non-dupatch installed CSP installations) are not inadvertently overwritten. You must take special action, through the baseline feature, to enable patch installation in this situation.

1.4 Patch Reversibility

By default, Release Patch Kits are made reversible during the installation so you revert your system to its state prior to the installation. If you choose to make patch kits nonreversible, you will not be able to uninstall the kit.

Customer-Specific patch kits are forced to be reversible when the CSP kit is manufactured. This forced reversibility overrides the reversibility option provided by `dupatch` during installation.

Patch reversibility is dependent upon saving the existing system files that will be updated by the patch. Saving these files requires the availability of adequate storage space in `/var/adm/patch/backup`, which can be a mount point for a separate disk partition, an NFS mount point, or a symbolic link to another file system. This allows you to configure your system to reduce the impact on system disk space for the `/`, `/usr`, and `/var` partitions.

The `dupatch` utility checks for the required storage space prior to patch installation. Patch installation is prevented if adequate backup space is unavailable.

1.5 Viewing the Patch Information

When you select the Patch Documentation item of the main menu, `dupatch` returns a menu that gives you access to different information:

- Problem summaries
Provide brief descriptions of the problems corrected by the patches. You can view the problems corrected by installed patches or by patches available from a specific kit.
- Full descriptions
Provide complete descriptions of the problems corrected by the individual patches. You can view the problem descriptions for installed patches or for patches available from a specific kit.
- Special Instructions
These files describe special instructions you need to be aware of for individual patches. You can view the instructions for installed patches or for patches available from a specific kit.

- Report identifiers
- Revision control strings

The following output shows the Patch Documentation menu and a typical session:

```
Patch Documentation Menu:
-----

    Installed patches on the system
    1) View problem summaries
    2) View full descriptions
    3) View special instructions
    4) View Problem Report Identifiers
    5) View Revision Control Strings
    Patches in the patch kit
    6) View problem summaries
    7) View full descriptions
    8) View special instructions
    9) View Problem Report Identifiers
    10) View Revision Control Strings
    All (installed and non-installed) patches
    11) View patch problem summaries
    12) View patch full descriptions
    13) View patch special instructions
    14) View Problem Report Identifiers
    15) View Revision Control Strings

    b) Back to Main Menu
    q) Quit

Enter your choice: 6

Patch Documentation Selection Menu:
-----

    1) List Release problem summaries
    2) List Customer Specific problem summaries
    3) List All problem summaries

    b) Back to Documentation Menu
    q) Quit

Enter your choice: 1

Enter path to the top of the patch distribution,
or enter "q" to get back to the menu  [/patches/pk4/patch_kit]: Return

    There may be more patches than can be presented on a single
    screen. If this is the case, you can choose patches screen by screen
    or all at once on the last screen. All of the choices you make will
    be collected for your confirmation before any patches are examined.

- Tru64_UNIX_V5.0A / Cluster Kernel Patches:
    1) Patch 00090.00 - versw command can core dump during rolling upgrade
    2) Patch 00186.00 - Disks can become inaccessible on a cluster node

- Tru64_UNIX_V5.0A / Commands, Shells, & Utilities Patches:
    3) Patch 00015.00 - Fixes a problem that occurs in multibyte locales
    4) Patch 00019
:
:
```

The patch description information and special instructions are conveniently organized in the *Patch Summary and Release Notes* document that is packaged with each kit.

1.6 Viewing Patch Tracking Information

The dupatch patch-tracking capability lets you view information about installed patches, such as lists of release patches and CSP and ERPs installed on the system and which patch kits you have installed.

For example, the following dupatch output shows the patch tracking menu with the List Installed patches menu item selected:

```
Patch Tracking Menu:
-----
```

```

1) List installed patches
2) List installed patch files
3) List patch kit information for installed patches
4) Show Patch History for selected patches
5) Show System Patch History

b) Back to Main Menu
q) Quit Enter your choice: 1

Patch Tracking Selection Menu:
-----

1) List Release Patches
2) List Customer Specific Patches
3) List All Patches

b) Back to Tracking Menu
q) Quit

Enter your choice:

Gathering details of relevant patches, this may take a bit of time

```

1.7 Handling Manually Installed System Files with Baselining

The dupatch baselining process looks at the files installed on a system, compares them to the files it expects to find, and prevents the installation of any patch files that might cause an incompatibility among system files. This section provides an overview of the baselining process. See Section 2.5 for instructions on setting a baseline.

Unknown system files occur when the files are replaced through non-standard system file installation methods such as the following:

- The manual installation of system files such as system administration customizations or manually installed patches
- Using the setld utility to install system files from user-derived setld subsets
- Using the setld utility to install files for layered software products
- Changes that result from weak system control programs (usually named *file.scp*)

Missing system files result from a root user manually deleting system files that were installed during a standard full or update installation procedure or with the dupatch utility. The file is removed but the system inventory records are still in place.

Unknown and missing system files will block patch installations until you take corrective action. However, before taking any action, it is important that you understand the origin of the unknown system files or why missing files are no longer present on your system. Changing the system without this knowledge could leave your operating system or layered product software environment in an inconsistent and nonoperational state.

For example, a file whose origin is unknown that is blocking the installation of a Release patch could be part of a manually installed Customer-Specific patch that is not contained in the Release patch. Removing that one file will disrupt the operation of your CSP and possibly the operation of the system.

When you run the dupatch system baseline feature, a baseline log file is captured in `/var/adm/patch/log/baseline.log`. (See Appendix A for information about log files.)

You may need to set the patch baseline for your system if you have manually installed system files or if dupatch informs you that patch installation is blocked by system files that are missing or unknown.

Warning

Misusing the baselining feature can cause serious problems with your system. It is important to be aware of the following potential problems:

- Enabling baselining to override its applicability checking could leave your operating system or layered product software environment in an inconsistent and nonoperational state.
 - Enabling baselining to update your system sets a new baseline for your operating system or TruCluster software environments. You will not be able to revert to the previous system state for manually installed patches that were marked as installed by baselining. HP recommends that you backup your `/`, `/usr`, and `/var` file systems before enabling system updates through `dupatch` baselining.
-

Baselining is divided into five phases that provide system information and optionally allow you to take actions that change the patch baseline of your system. You can run through all phases of baselining to get the system analysis without enabling changes to your system. You can run baselining in multiuser mode when you are the root user.

1.7.1 Phase 1 – System Evaluation

The primary goal of Phase 1 is to evaluate your system relative to the patch kit that is being installed. However, the baselining feature will report all missing and unknown files to assist you in better understanding the state of the changed files on the system.

The rest of the baselining phases use the information gathered in Phase 1 to inform you of any installation conflicts for patches contained in the patch kit.

The amount of time needed to evaluate the state of the system varies greatly depending on the size of the patch kit, the version of the software product, and the performance of the system.

1.7.2 Phase 2 – Patch Layered Product Conflicts

Phase 2 reports information for patches whose installation is blocked by system files that were installed by layered products.

Baselining will not override layered product patch installation collision detection mechanisms as it is likely that the layered product or application customizations are not contained in the patch. Installation of the patch in this situation would leave the layered product or application nonoperational.

To resolve this situation, contact your layered product or application Customer Services or HP Services if you have purchased Business Critical Services.

1.7.3 Phase 3 – Identifying Manually Installed Patches

Phase 3 reports patches that exactly match existing files on your system that are not marked as *installed* by the system inventory. For example, in earlier kits, TruCluster software Release patches were installed manually. This phase will report any manually installed Release patch files that exactly match a patch contained in the current `dupatch`-based TruCluster software patch kit.

You can optionally enable `dupatch` to mark these patches as *installed*, which involves copying valid `setld` database information to your system. The `dupatch` utility will copy the appropriate `patch_subset.inv`, `patch_subset.scp`, and `patch_subset.ctrl` files into place for these patches.

If you do not want to enable `dupatch` to mark these patches as installed, you must manually remove the patched system files so the normal `dupatch` installation can install the affected patches.

1.7.4 Phase 4 – Handling Missing or Unknown Files on Your System

Phase 4 reports information about any unknown and missing system files. These files should be considered as intentional customizations which are important to correct system operation. As such, care should be taken to understand why system files have been customized.

Before enabling any patch installations in Phase 5, review the information reported in Phase 4 against your log of manual system changes to ensure you understand why the system was intentionally customized and to determine how to proceed. In some cases you may need to remove customizations to ensure proper system operation.

To assist you in identifying the origin of changed system files, baselining now reports all missing or unknown system files.

The following sections provide general guidance for some of the normal situations where system files are intentionally customized manually.

1.7.4.1 Manually Installed Customer-Specific Patches

In response to a problem report, you may receive a manually installable Customer-Specific patch from your service provider. Customer-Specific patches are a set of compatible files that deliver fixes to the problems you reported. Additionally, the patch may include instrumentation necessary for debugging purposes.

If your system was customized through a manual installation of Customer-Specific patches, you must ensure that the fixes delivered by the Customer-Specific patches are included in the current Release Patch Kit before enabling `dupatch` to overwrite any unknown or missing system files.

Warning

If you are unsure if the Customer-Specific patch is included in the Release Patch Kit, do not enable `dupatch` to overwrite the manually installed Customer-Specific patch. If you must install the Release patch being blocked by a Customer-Specific patch, contact your service provider for assistance.

If the unknown or missing files are attributable to manually installed Customer-Specific patches that are included in a Release Patch Kit, perform one of the following steps:

- If all Customer-Specific patch files are overwritten by the patches noted in Phase 5, you can safely enable `dupatch` to overwrite applicable missing or unknown system files.
- If some of the Customer-Specific patch files are not overwritten by the patches noted in Phase 5, contact your service provider for assistance.

To determine if your Customer-Specific patch is included in the Release Patch Kit, refer to the *Patch Summary and Release Notes* for the Release Patch Kit. See Patch Process Resources and Related Documentation for information about viewing patch documentation on the Web.

1.7.4.2 Manually Installed Release Patches

For some software products, manual installation has been the practiced method for patch installation. For example, patches for TruCluster software used to be installed manually.

You must determine whether the fixes delivered by the manually installed Release patches are included in the current `dupatch`-based Release Patch Kit before enabling `dupatch` to overwrite any unknown or missing system files. Once you have made this determination, proceed as follows:

- If the unknown or missing system files are attributable to the manual installation of Release patches and those patches are included in the current `dupatch`-based Release Patch Kit, you can safely enable `dupatch` to overwrite applicable missing or unknown system files.
- If the unknown or missing system files are not attributable to manual installation, you must understand the origin of the unknown or missing system files by reviewing the information reported in Phase 4 against your log of manual system changes to ensure you understand why the system was intentionally customized, and to determine how to proceed.

1.7.4.3 User Customized Commands and Utilities

Periodically, system administrators of production computing environments replace Tru64 UNIX commands or utilities with freeware or their own customized version of the command or utility. In this situation you must ensure the unknown or missing files are attributable to intentional replacement of commands, utilities, or other system files.

If the unknown or missing system files are attributable to the replacement of commands, utilities, or other system files with customized versions for the computing environment, do not enable `dupatch` to overwrite the manually installed customized files. Instead, determine the reason for the customization and then decide how to proceed.

1.7.5 Phase 5 – Enabling `dupatch` to Overwrite Changed System Files

Phase 5 reports patches that are blocked due to missing or unknown system files, and optionally allows you to override the `dupatch` conflict management mechanism so the `dupatch`-based patch may be installed.

For each patch that is blocked by a missing or unknown system file you are presented with the following information:

- Software product identifier
- Patch category
- Patch identifier
- Patch subset description
- The list of unknown and missing files that block the patch installation
- The origin of all other files contained in the patch

Optionally, you can enable `dupatch` to override the collision detection mechanisms and install any of these patches. Use the missing and unknown file information presented in Phase 4 and your system administration log of manual system changes to make Phase 5 patch installation enabling decisions.

Warning

Do not enable `dupatch` to install patches over missing or unknown system files for which you do not know the origin. Doing so may leave your operating system and TruCluster software environment in an inconsistent and nonoperational state.

1.8 Version Switches

A version switch manages the transition of the active version to the new version of an operating system. The active version is the one that is currently in use.

In the old-style patch kits, version switches are controlled by the `clu_upgrade -switch` command during a rolling patch. See Section 4.10 for more information.

With the new-style kits, you must manually enable the version switch. See Section 3.6.1 for more information

Preparing for the Installation

This chapter describes information you need to be aware of before you install a patch kit. It also describes the steps to take for tasks such as performing a preinstallation check and a baselining operation.

2.1 Preinstallation Tasks

Before using the latest Tru64 UNIX and TruCluster software patch distribution, make sure that your system meets the required criteria and that you perform certain preinstallation tasks, as described in the following list:

- **Make sure you have the correct software**
You must have the appropriate versions of Tru64 UNIX and TruCluster software installed on your system to install patch kits. There are separate patch kits for each version of the Tru64 UNIX and TruCluster software products. The patch kits will not install on any other version of those products. For example, a Tru64 UNIX 5.1B patch kit will only install on Tru64 UNIX Version 5.1B.
- **Back up your system**
It is recommended that you backup your /, /usr, and /var file systems prior to installing patches or baselining your system.
- **Make sure you have enough storage space**
Refer to the *Patch Summary and Release Notes* for the required storage space.

2.2 Making the Patch Distribution Available

The following list describes the steps to make the patches available for installation:

1. Ensure the installation prerequisites described in Section 2.1 are met.
2. If you are using patch tar files obtained via the Internet from HP (see Patch Process Resources), you must expand the tar file to access the patch kits. The tar file can be expanded on any mountable file system. For example:

```
# /usr/sbin/mount /dev/disk/dsk3g /patches
# cd /patches
# mkdir pk4
```

Note

If you are installing successive patch kits, place and untar each kit in a separate directory.

Copy or ftp the patch kit to /patches/pk4. For example:

```
# cp T64V51B18AS0003-20011020.tar /patches/pk4
```

3. Untar the patch kit, capturing the process to a log file. For example:

```
# script untar.log
# tar -xpvf /patches/pk4/T64V51B18AS0003-20011020.tar
# Ctrl/d
```

4. View the untar.log for errors or failures untarring the file.

2.3 Running dupatch

After you have made the patch kits available to the system being patched, run dupatch; for example:

```
# /patches/pk4/patch_kit/dupatch
```

You can also change directories to the patch_kit directory:

```
# cd /patches/pk4/patch_kit
# ./dupatch
```

If new patch tools are available they will be loaded and you will see messages similar to the following:

```
* A new version of patch tools required for patch management
  is now being installed on your system.

* Tools updated, invoking the updated Patch Utility...
```

The dupatch utility saves information on the tools that have been loaded to the log file /var/adm/patch/log/Dupatch_load_date.log. (See Appendix A for information about log files.)

Note

It is important that you run the dupatch utility located in the /patch_kit directory every time you obtain new patch tar files or a new Tru64 UNIX Patch CD-ROM in order to update the patch tools. See Section 2.6.4 for information you need to be aware of when installing from the command line.

After the new tools have been loaded, dupatch prompts you for the path to the patch kit files. After you specify the path (or press Return if the patch kit is in your current directory) you will see the main menu. For example:

```
Enter path to the top of the patch distribution,
or enter "q" to get back to the menu : /patches/pk4/patch_kit

Tru64 UNIX Patch Utility (Rev. 46-00)
=====
- This dupatch session is logged in /var/adm/patch/log/session.log

Main Menu:
-----

1) Patch Kit Installation
2) Patch Kit Deletion
3) Patch Kit Documentation

4) Patch Tracking
5) Patch Baseline Analysis/Adjustment

h) Help on Command Line Interface

q) Quit

Enter your choice:
```

2.4 Performing Patch Preinstallation Check Instructions

To minimize system down time, you can perform the preinstallation check on a system running in multiuser mode, even if you will perform the actual installation in single-user mode.

Note that the menu you see will differ slightly, depending upon whether you log in from a pseudo-terminal or a system console. The following steps assume you logged in from a pseudo-terminal.

1. Log in as root.

2. From the main dupatch menu, enter 1 at the Enter your choice prompt:

```
Tru64 UNIX Patch Utility (Rev. 46-00)
=====
- This dupatch session is logged in /var/adm/patch/log/session.log

Main Menu:
-----

1) Patch Kit Installation
2) Patch Kit Deletion
3) Patch Kit Documentation

4) Patch Tracking
5) Patch Baseline Analysis/Adjustment

h) Help on Command Line Interface

q) Quit

Enter your choice: 1
```

3. The program responds with the Patch Installation Menu. Enter 1 at the Enter your choice prompt:

```
Patch Installation Menu:
-----

1) Pre-Installation Check ONLY
2) Check & Install in single-user mode w/ network services
3) Check and Install in Multi-User mode

b) Back to Main Menu
q) Quit

Enter your choice: 1

Checking patch kit for transmission errors during download...

Finished Checking patch kit checksums

Gathering patch information...
(dependent upon the size of the patch kit, this may take awhile)

*** Start of Special Instructions ***

*** There are NO Special Instructions ***

Press RETURN to proceed...
```

4. You have the option to make the patches reversible so you can revert the system to its state prior to the installation of a patch. The dupatch utility lists the following information. Press Return at the prompt to make the patches reversible. This is the recommended action.

```
-----
To Make Patches Reversible - PLEASE READ THE FOLLOWING INFORMATION:

- You have the option to make the patches reversible so you can
  revert the system to its state prior to the installation of a patch.

- Reversibility is achieved by compressing and saving a copy of the
  files being replaced by the patches. These files would be restored
  to the system if you choose to delete a patch.

- If you choose to make patches NON-reversible, then the system cannot
  be restored to the state prior to the installation of a patch; you
  will not be able to delete the patches later.

- This patch kit may force a small set of patches to be reversible to
  ensure your upgrades to future versions of Tru64 UNIX are successful.
  The Patch Utility will make those patches reversible automatically.

Refer to the Release Notes / Installation Instructions provided with
this patch kit.

Do you want the patches to be reversible? [y]: Return

By default, the backup copies of the installed patches will be saved in
"/var/adm/patch/backup".
```

If you have limited space in /var, you may want to make the backup directory the mount point for a separate disk partition, an NFS mounted directory, or a symbolic link to another file system.

You must ensure the backup directory is configured the same way during any patch removal operations.

Your current setup of "/var/adm/patch/backup" is:

* A plain directory (not a mount point or a symbolic link)

By default, the backup copies of the installed patches will be saved in /var/adm/patch/backup. If you have limited space in /var, you may want to make the backup directory the mount point for a separate disk partition, an NFS-mounted directory, or a symbolic link to another file system.

5. Answer yes when asked if you want to perform the preinstallation check with this setup:

Do you want to proceed with the pre-installation check with this setup? [y]: **Return**

6. For the old style kits kits, the program then lists the patches that apply to your system. When performing this operation on an inclusive patch kit, the individual patches are not displayed. Another difference between the two types of kits is that for the old style kits kits you can perform the preinstallation check on specific patches.

The patches you select during this process are only analyzed in relation to your system; they are not installed. The option that reads EXIT without installing any patches is misleading in that no patches are installed regardless of which option you select during the preinstallation check.

The following output is from a preinstallation check of the old style patch kit.

The patches listed below are optional:

There may be more optional patches than can be presented on a single screen. If this is the case, you can choose patches screen by screen or all at once on the last screen. All of the choices you make will be collected for your confirmation before any patches are installed.

- Tru64_UNIX_V5.0A/ Cluster Kernel Patches:

- 1) Patch 00090.00 - versw command can core dump during rolling upgrade
- 2) Patch 00186.00 - Disks can become inaccessible on a cluster node

- Tru64_UNIX_V5.0A / Commands, Shells, & Utilities Patches:

- 3) Patch 00015.00 - Fixes a problem that occurs in multibyte local :
- 96) Patch 00176.00 - Memory leaks occur when creating widgets :
- 97) Patch 00180.00 - Fixes memory leak in libXm
- 98) Patch 00182.00 - libXm memory leak when creating widgets

Or you may choose one of the following options:

- 99) ALL of the above
- 100) CANCEL selections and redisplay menus
- 101) EXIT without installing any patches

Enter your choices or press RETURN to redisplay menus.

Choices (for example, 1 2 4-6): **99**

After the program lists the patches you have selected, it asks you to confirm the selection and runs the preinstallation check if you answer yes:

Is this correct? (y/n): **y**

Checking patch prerequisites and patch file applicability...
(depending upon the number of patches you select, this may take awhile)

*** You have selected 98 patches ***

Checking system space needed for patch installation and backup...

```

Pre-Installation Check COMPLETED with the following results:

98 patches passed Pre-Installation Check

0 patches failed Pre-Installation Check
*****

Press RETURN to continue...

```

7. The program lists any patches that fail the prerequisite and applicability checks, and asks how you want to proceed. You have the following choices:

```

Select the action you'd like to take:

1) proceed with the patches that passed the check
2) select patches again
3) go back to the previous menu

```

If the patches are prevented from being installed because of missing or unknown system files, set the system patch baseline, as described in Section 2.5. If patches are prevented from being installed because dependent patches were not selected, choose the select patches again item and add the required patches that are missing.

Otherwise, proceed to the installation phase, as described in Chapter 3.

2.5 Setting a Patch Baseline

If your system was customized as a result of the manual installation of any system files, you will need to set the patch baseline for your system. If you do not need to set the patch baseline for your system, proceed to Chapter 3.

Note

You will need to be familiar with the concepts of baselining in Section 1.7 before performing the steps in this section.

You can set the patch baseline in multiuser mode, thereby minimizing system down time.

The following steps show you how to set a patch baseline for an inclusive patch kit. The process is similar for the old style kits, but the dupatch display differs slightly.

1. Log in as root.
2. Run dupatch and enter 5 in response to the Enter your choice prompt of the Main Menu:

```

Tru64 UNIX Patch Utility (Rev. 46-00)
=====
- This dupatch session is logged in /var/adm/patch/log/session.log

Main Menu:
-----

1) Patch Kit Installation
2) Patch Kit Deletion
3) Patch Kit Documentation

4) Patch Tracking
5) Patch Baseline Analysis/Adjustment

h) Help on Command Line Interface

q) Quit

Enter your choice: 5

```

3. Enter the location of the patch distribution:

```

Enter path to the top of the patch distribution,
or enter "q" to get back to the menu [/patches/PK4/patch_kit]:

```

The old style patch kits do not provide a default location.

The summary of the patch baselining phases provides the following information:

- Baselining Phase 1 evaluates your system relative to the patch kit.
- Baselining Phase 2 reports information for patches whose installation is blocked by system files that were installed by layered products. You cannot enable `dupatch` to install patches that replace system files installed by layered products. You must contact your layered product customer services or HP Services if you have purchased Business Critical Services.
- Baselining Phase 3 reports on patches that match existing files on your system, but are not marked as *installed* by the system inventory. You can tell `dupatch` to mark these patches as *installed*. This involves copying valid `setld` database information to your system. If exact matches are found you will be asked the following question:

```
Do you want to mark these patches as installed ? [y/n]
```

You must provide an answer; there is no default answer.

- Baselining Phase 4 reports information about any unknown or missing system files. This information is provided to assist you in understanding the state of files that may prevent patch installation.

Consider this information carefully when making decisions to override patch-installation checks for patches noted in Phase 5.

- Phase 5 reports patches that do not pass installation applicability tests due to the current state of your system. The installation of these patches is prevented by missing or unknown system files.

The `dupatch` utility reports the known information about the files contained in each patch and asks if you want to enable the installation:

```
Do you want to enable the installation of any of these patches? [y/n]:
```

Answer n, until you know the origin of the files that are preventing the patch installation. The changed system files that are preventing the Release patch installation may be part of a manually installed Customer-Specific patch or an intentionally customized utility or file.

If, for example, the file that is preventing the installation of a Release patch is one of many files that are part of a Customer-Specific patch, you must determine how to proceed. For more information, see Section 1.7.4.1 and Section 1.7.5.

If you answer y to this question, what follows depends on whether you are installing an inclusive patch kit or an old style patch kit:

- When installing an inclusive patch kit, `dupatch` enables all of the patches to be installed.
- When installing an old style patch kit, you are given the option to select which patches you want installed and are given the opportunity to confirm your selections.

Caution

Do not enable `dupatch` to install patches over missing or unknown system files for which you do not know the origin. To do so might leave your operating system or TruCluster software environments in an inconsistent or nonoperational state.

2.6 General Issues and Restrictions

This section provides information you must be aware of when installing or removing patches. Be sure to check the *Patch Summary and Release Notes* document of the kit you are installing for any issues and restrictions that pertain to that installation.

2.6.1 When Single-User Mode Is Recommended

Although you can install patches in multiuser mode, we recommend that you bring down your system to single-user mode when installing patches that affect the operation of the Tru64 UNIX operating system or the product you are patching. If your system must remain in multiuser mode, apply the patches when the system is as lightly loaded as possible.

There are no restrictions on performing patch selection and preinstallation checking in multiuser mode. Patch removals can only be done in single-user mode.

2.6.2 Use Clean Directory for Each Patch Kit

When installing a patch kit downloaded from the Web, untar the file in a clean directory; that is, one that does not contain files from a previous patch kit. A failure to do this can have adverse consequences when installing the new kit.

2.6.3 Patching a System Prior to Creating a Cluster

Patching your system before creating your cluster can save you time, although if you do so, be aware that you cannot then remove the patch kit.

The following steps describe how to patch your system before creating a cluster:

1. Install and configure the Tru64 UNIX operating system.
2. Use the `setld` command to install the TruCluster software kit. If the TruCluster software kit is not loaded before the patch operation, patches for TruCluster software will not be loaded.
3. Patch the system.
4. Use the `clu_create` command to create the single-member cluster.

See the Tru64 UNIX *Installation Guide* for information about installing the operating system and the TruCluster *Cluster Installation* manual for information about creating your cluster.

2.6.4 Restriction on Loading New dupatch Tools from the Command Line

The new patch tools cannot be loaded using the `delete` command on the command line. Doing that will cause the following error to be displayed:

```
product_map does not exist or is empty, Cannot continue.
```

If you want to use `delete` from the command line, you can first load the new tools, without affecting the system, by issuing the `install` command with the `-precheck_only` option. This will load the tools and not cause changes to your system.

2.6.5 RIS and DMS Unsupported for Patch Installation

Remote Installation Services (RIS) and Dataless Management Services (DMS) installations of patches are not supported. However, the patch kit installation mechanism does support network installation via NFS.

2.6.6 Direct setld Installation and Removal of Patch Subsets Is Not Allowed

You can install and remove Tru64 UNIX and TruCluster software patches only through `dupatch`. You cannot directly install or reinstall the patch subsets with `setld`. This ensures that patch tracking and management are not compromised.

2.6.7 Limitation for /var/adm/patch/backup Directory Handling

The patch management utility assumes there is one `/var/adm/patch/backup` directory per system. It does not handle placement of archived original files for multiple systems in one directory.

2.6.8 Do Not Enter Ctrl/c During Installation Phase

Do not enter a Ctrl/c command during the installation phase of the patch kit.

Caution

As with any system update, entering a Ctrl/c during this phase could leave the operating system software environment in an inconsistent and nonrecoverable state.

2.6.9 Removing Patches Containing Customized Files

If you use `dupatch` to remove a patch containing a customized file, messages similar to the following may appear in the session log file, `/var/adm/patch/log/session.log`:

```
- Tru64_UNIX_V5.1B / Network Patches:
  Patch 25020.00 - SP04 OSFCLINET540 (SSRT3653 SSRT2384 SSRT2275 ...)

  Customization found in ./etc/inetd.conf.

  Before the backup was restored, we had saved a copy of this file in:

      ./etc/inetd.conf.PreDel_OSFPAT02502000540

  Please compare ./etc/inetd.conf with this saved copy.

  If there are extra customizations you want to keep, you would need
  to merge them into ./etc/inetd.conf manually.

  ./etc/inetd.conf.PreDel_OSFPAT02502000540
  can be removed afterwards.
```

This message warns you to examine the removed patch for any customized files it may contain, which in this example is the file `/etc/inetd.conf`. In order to keep those customizations, you will have to manually add them.

The following are examples of such customized files:

- `/usr/var/spool/cron/crontabs/root`
- `/etc/sysconfigtab`
- `/usr/var/adm/sendmail/sendmail.cf`

2.6.10 Release Patches Do Not Automatically Supersede CSPs

Release patches do not automatically supersede `dupatch`-based Customer-Specific patches (CSPs). Any Release patch blocked by a CSP will result in a `dupatch` message. See Section B.1.7 for more information. See the release notes of the new style patch kits for a list of CSPs that are included in those patch kits.

2.6.11 Impact on System Upgrades to Later Versions of Tru64 UNIX

In the presence of patches of layered products, certain procedures used to upgrade a system to a later version of Tru64 UNIX can lead to inconsistencies among operating system and layered product objects.

Note

After successfully installing a new version of Tru64 UNIX, you should obtain and install the latest patch kit that is applicable to that version of Tru64 UNIX.

Patch Installation and Removal Instructions

This chapter provides instructions for installing and removing patches from the Tru64 UNIX operating system and the TruCluster software products. Although the descriptions and examples in this chapter reflect the installation and removal steps of Release Patch Kits, the steps are basically the same for `dupatch`-based CSP and ERP kits. See Appendix C for examples (log files) of complete patch installation and removal procedures.

Chapter 4 describes the procedure for patching a TruCluster Server Version 5.0A or higher cluster using the rolling upgrade function. If you are patching your system with that process, follow the steps described there. You will be returned to this chapter when it is time to run `dupatch`.

If you have not yet created your cluster, follow the steps in Section 2.6.3.

The `-l` of the `setld` command is disabled for patch subsets.

3.1 Before You Begin the Installation

Before beginning the installation, make sure that you have completed all of the following preliminary steps:

- Make sure your system meets the installation prerequisites described in Section 2.1.
- Make the patch distribution available to your system, as described in Section 2.2.
- Load any new patch tools, as described in Section 2.3.
- Perform the patch preinstallation check, as described in Section 2.4.
- Set a system patch baseline, if needed, as described in Section 2.5.
- Review the list of issues and restrictions in Section 2.6 and in the *Patch Summary and Release Notes* document that comes with your patch kit.

The following sections provide step-by-step instructions for installing and enabling patches.

3.2 Choosing Single-User or Multiuser Mode

You can install patches from either single-user or multiuser modes. See Section 2.6.1 for information about selecting one of these modes. Section 3.2.1 describes the process from single-user mode and Section 3.2.2 describes the process from multiuser mode. Section 3.3 describes the remaining steps, which are common to installations from single-user and multiuser modes.

3.2.1 Installing Patches from Single-User Mode

The following steps describe a patch kit installation from single-user mode. Although these steps are the same whether installing an old or new style patch kit, the text that `dupatch` displays differs in minor ways. The examples used in these steps reflect the output of a new style patch kit installation.

1. Halt the system. For example:

```
# /usr/sbin/shutdown -h +5 "Applying 5.1 and TCR Patches"
```

2. Boot to single-user mode from the console prompt. For example:

```
>>>boot -fl s
```
3. Run the `init s` command to change the run level to a single-user state with only essential kernel services:

```
# /sbin/init s
```
4. Run the `bcheckrc` command to check and mount all the UFS and AdvFS file systems, the `kloadsrv` command to load kernel modules into the kernel, and the `lmf reset` command to copy license details for all enabled products from the License Database to the kernel cache:

```
# /sbin/bcheckrc
# /sbin/kloadsrv
# /usr/sbin/lmf reset
```
5. For systems prior to 5.0A, issue the `update` command and activate your swap partition with the `swapon` command:

```
# /sbin/update
# /sbin/swapon -a
```
6. Enter the `rcinet` command to start network services:

```
# /usr/sbin/rcinet start
```

Informational messages will appear on the screen.
7. Run the `dupatch` utility. You will be asked to specify the path to the `patch_kit` file. For example:

```
# cd /var/patch/patch_kit
# ./dupatch
```

Enter path to the top of the patch distribution,
or enter "q" to quit : .
8. From the Main Menu, enter 1 at the Enter your choice prompt to invoke the patch installation session. For example:

```
Tru64 UNIX Patch Utility (Rev. 46-00)
=====
- This dupatch session is logged in /var/adm/patch/log/session.log

Main Menu:
-----

1) Patch Kit Installation
2) Patch Kit Deletion
3) Patch Kit Documentation

4) Patch Tracking
5) Patch Baseline Analysis/Adjustment

h) Help on Command Line Interface

q) Quit

Enter your choice: 1
```
9. When the patch installation menu is displayed, enter 2 at the Enter your choice prompt:

```
Patch Installation Menu:
-----

1) Pre-Installation Check ONLY
2) Check & Install the patch kit in Single-User Mode

b) Back to Main Menu
q) Quit

Enter your choice: 2
```

3.2.2 Installing Patches from Multiuser Mode

The following list describes the steps you take and the type of output you will see when you install patches from multiuser mode.

1. Run the dupatch utility and enter 1 at the Enter your choice prompt to the invoke the patch installation session:

```
# /patches/pk4/patch_kit/dupatch
Tru64 UNIX Patch Utility (Rev. 46-00)
=====
- This dupatch session is logged in /var/adm/patch/log/session.log

Main Menu:
-----

1) Patch Kit Installation
2) Patch Kit Deletion
3) Patch Kit Documentation

4) Patch Tracking
5) Patch Baseline Analysis/Adjustment

h) Help on Command Line Interface

q) Quit

Enter your choice: 1
```

2. When the patch installation menu is displayed. Enter 3, at the Enter your choice prompt. Read the warning message and press Return if you want to continue the installation in multi-user mode:

```
Patch Kit Installation Menu:
-----

1) Pre-Installation Check ONLY
2) Check & Install in single-user mode w/ network services
3) Check & Install in Multi-User mode

b) Back to Main Menu
q) Quit

Enter your choice: 3

*** Installation Warning ***

You have chosen to install the patch kit onto this system while it is
running in Multi-User mode. Some patches may directly affect core operating
system operations. To ensure the proper operation of all applications, it is
strongly suggested that you install these patches while the system is in
Single-User mode. If this cannot be done, install these patches when the
system is as lightly loaded as possible (i.e. not running production
environments, no users logged on, etc.).

Do you wish to continue? (y/n) [y]:
```

3.3 Common Installation Steps

The following steps provide instructions for continuing the installation of Tru64 UNIX and TruCluster software patches after you have selected either single-user or multiuser mode.

1. You have the option to make patches reversible so you can return the system to its state prior to the installation of a patch. Enter y or press Return to make the patches reversible. For example:

```
Do you want the patches to be reversible? [y]:
```

By default, backup copies of the installed patches are saved in /var/adm/patch/backup. If you have limited space in /var, you may want to make the backup directory the mount point for a separate disk partition, an NFS-mounted directory, or a symbolic link to another file system.

If you answer no to this question, the existing system files will not be saved and the installed patches will not be reversible. HP recommends that you install patches so they are reversible.

2. The program describes your backup setup and asks you if you want to proceed:

```
Do you want to proceed with the installation with this setup? [y]:
```

3. You are asked to record your name as the person installing the patches and to add any comments you would like stored for future reference. For example:

```
Your name: Joe C.
```

Enter any notes about this operation that you would like stored for future reference. To end your input, enter a period (.) and press Return.

```
: Installing Patch Kit 4
: . Return
```

4. The next action depends on the type of kit you are installing:

- Inclusive patch kit

With this type of kit dupatch performs a preinstallation check and begins to install the patches if it finds no problems. For example:

```
Checking patch prerequisites and patch file applicability...
(dependent upon the number of patches you select, this may take awhile).

*** Installing 78 patches ***
```

If any patches fail the preinstallation check, do one of the following:

- If the failure is the result of a file conflict, you will need to run the patch baseline process, as described in Section 2.5.
- If the failure is caused by an installed CSP that is not included in the current patch kit, you will have to remove the CSP, install the patch kit, and reinstall the CSP. See Section B.1.8 for more information.

- Old style patch kit

With this type of kit, dupatch lists the patches available for installation on your system. This list may be different from system to system because dupatch does not display available patches that are already installed on your system.

You can install all patches (as we recommend) or selectively choose patches for installation. You can also cancel selections and redisplay menus, or exit without installing any patches. For example:

```
130) Patch 0381.00 - Motif Toolkit Correction
131) Patch 0384.00 - Various X11 Server Corrections

Choices (for example, 1 2 4-6) :
```

Or you may choose one of the following options:

```
134) ALL of the above
133) CANCEL selections and redisplay menus
134) EXIT without installing any patches
```

Selecting CANCEL cancels your patch selections and returns to the patch list and selection menus so you can reselect patches for installation.

Selecting EXIT returns you to the dupatch installation menu.

If dupatch finds a problems during the preinstallation check, it lists the specific patches that fail and asks how you want to proceed:

```
Select the action you'd like to take:
```

```
1) proceed with the patches that passed the check
2) select patches again
3) go back to the previous menu
```

If you choose to proceed with patches that passed the preinstallation check, `dupatch` installs those patches and displays informational messages. The entire `dupatch` session is logged to ensure you can view any messages that may scroll off the screen.

If patch installation is blocked due to missing or unknown system files, refer to Section 2.5.

- Customer-Specific patch kit

With this type of kit you must install all patches. You can, however, remove individual CSPs after the installation process is completed and the system has been rebooted.

3.4 Rebuilding the Kernel

The `dupatch` utility determines whether the installation or removal of patches requires that the kernel be rebuilt. This action is performed automatically or manually, depending upon the method you used to install the patches:

- When using the menu-based interface, you will be prompted for actions to take. Those prompts are the same ones you would see if you ran the `doconfig` command. The `dupatch` utility asks if your system has a custom configuration file and if you want to change it.
- When using `dupatch` from the command line, the kernel is built automatically. It does this by calling the `doconfig -a` command. If you specify the `dupatch -cfgfile` command, `dupatch` calls `doconfig` with the `-a -c` options.

After the patch kit is installed you will see output similar to the following:

```
Configuring "Patch: SP04 OSFADVFSBIN540" (OSFPAT02500300540)
Configuring "Patch: SP04 OSFADVFS540 (SSRT2275)" (OSFPAT02500200540)
Beginning kernel build...
```

Do you have a pre-existing configuration file?:

If you answer yes, `dupatch` will build the kernel noninteractively, enabling all (mandatory and optional) kernel options automatically. This procedure is similar to running the `doconfig -a` command.

If you answer no, `dupatch` will build the kernel interactively. This procedure is similar to running the `doconfig -c` command. The following steps describe this procedure and provide some guidance for making your selections:

1. Enter a new name for the kernel configuration file or accept the default. If you accept the default you will be asked if you want to replace it. For example:

```
*** KERNEL CONFIGURATION AND BUILD PROCEDURE ***
```

```
Enter a name for the kernel configuration file. [IDIOM2]: Return
```

```
A configuration file with the name 'IDIOM2' already exists.
```

```
Do you want to replace it? (y/n) [n]: y
```

```
Saving /sys/conf/IDIOM2 as /sys/conf/IDIOM2.bck
```

2. Specify the kernel options you want. If you are unsure of which options to specify, consider the following:

- Selecting the All of the Above option ensures that you can access any new functions provided by the patch kit. You may, however, create a kernel that is larger than you need.

If you know of options you do not need, you can ignore those and specify all of the other options, thereby ensuring that you will have access to the new functions you need but with a smaller kernel than if you had selected all of the options.

- Selecting the None of the Above option will result in a kernel build that is similar to using the `doconfig -ac` command. This is the default.

The following output is similar to what you will see. The procedure gives you the opportunity to edit the configuration file:

```
*** KERNEL OPTION SELECTION ***

      Selection      Kernel Option
-----
1 System V Devices
2 NTP V3 Kernel Phase Lock Loop (NTP_TIME)
3 Kernel Breakpoint Debugger (KDEBUG)
4 Packetfilter driver (PACKETFILTER)
5 IP-in-IP Tunneling (IPTUNNEL)
6 IP Version 6 (IPv6)
7 Point-to-Point Protocol (PPP)
8 STREAMS pckt module (PCKT)
9 Data Link Bridge (DLPI V2.0 Service Class 1)
10 X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
11 Digital Versatile Disk File System (DVDFS)
12 ISO 9660 Compact Disc File System (CDFS)
13 Audit Subsystem
14 ATM UNI 3.0/3.1 ILMI (ATMILMI3X)
--- MORE TO FOLLOW ---
Enter your choices or press <Return>
to display the next screen.

Choices (for example, 1 2 4-6): 2-12
15 IP Switching over ATM (ATMIFMP)
16 LAN Emulation over ATM (LANE)
17 Classical IP over ATM (ATMIP)
18 ATM UNI 3.0/3.1 Signalling for SVCs (UNI3X)
19 Asynchronous Transfer Mode (ATM)

The following choices override your
previous selections:

20 All of the above
21 None of the above
22 Help
23 Display all options again
-----

Enter your choices, choose an overriding action or
press <Return> to confirm previous selections.

Choices (for example, 1 2 4-6): Return

You selected the following kernel options:
NTP V3 Kernel Phase Lock Loop (NTP_TIME)
Kernel Breakpoint Debugger (KDEBUG)
Packetfilter driver (PACKETFILTER)
IP-in-IP Tunneling (IPTUNNEL)
IP Version 6 (IPv6)
Point-to-Point Protocol (PPP)
STREAMS pckt module (PCKT)
Data Link Bridge (DLPI V2.0 Service Class 1)
X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
Digital Versatile Disk File System (DVDFS)
ISO 9660 Compact Disc File System (CDFS)

Is that correct? (y/n) [y]: Return

Do you want to edit the configuration file? (y/n) [n]: Return

*** PERFORMING KERNEL BUILD ***

A log file listing special device files is located in /dev/MAKEDEV.log
Working....Tue Mar  9 11:36:33 EST 2004

The new kernel is /sys/IDIOM2/vmunix
```

See the [doconfig\(8\)](#) reference page for more information.

3.5 Rebooting the System

The action that `dupatch` takes to reboot your system depends upon whether you used the command-line or menu-based interface or performed the action in single-user or multiuser mode. The following sections describe these actions.

Before rebooting, review the `dupatch` session log, `/var/adm/patch/log/session.log`, to ensure that the installation was successful. Note any special patch instructions, informational messages, and error messages. Certain patches may require you to take a particular action, such as running a script, before rebooting. (See Appendix A for information about `dupatch` logs.)

3.5.1 In Single-User Mode

When performing a patch installation or removal in single-user mode from the command line, the system automatically reboots after the command line operation is completed.

When performing a patch installation or removal in single-user mode using the menu-based interface, `dupatch` asks if you want to reboot the system after the patch installation or removal is completed:

- If you answer yes, the system reboots immediately.
- If you answer no, `dupatch` returns to the appropriate menu — either installation or removal, depending on the operation.

3.5.2 In Multiuser Mode

When installing patches in multiuser mode from the command line, you are given a message informing you that a reboot is necessary to complete the patch installation. However, the system does not reboot itself.

When installing patches in multiuser mode using the menu-based interface, `dupatch` gives you three options if a reboot is necessary:

- Reboot now
- Schedule a reboot for a later time
- Do not reboot

3.6 Post-Installation Actions

The following sections describe actions for you to take after you have completed the `dupatch` installation procedure.

3.6.1 Enabling the Version Switch After Installing a New Style Patch Kit

Some patches may require you to run the `versw -switch` command to enable the new functions delivered in those patches. (See Section 1.8 for information about version switches.) You perform this action after `dupatch` has completed the installation:

```
# versw -switch
```

The new functionality will not be available until after you reboot your system. You do not have to run the `versw -switch` command, but if you do not, your system will not be able to access the functionality provided in the version switch patches.

3.6.2 Remove Temporary Directory

Once your patch kit is installed, delete the temporary directory in which you expanded the patch kit tar file. For example:

```
# rm -r /Patches/PK4
```

Removing the temporary directory will preclude the possibility of using that directory for subsequent patch kit installations. When performing a patch kit installation, using a directory that contains files from a previous patch kit installation can leave your system in an unstable condition.

Remember that if you want to save the patch kit tar file, remove it from the temporary directory before deleting the directory.

3.6.3 Adding the Worldwide Language Support

Inclusive patch kits provide patches to the Tru64 UNIX Worldwide Language Support subset (WLS). If the WLS subset is installed on your system, the WLS patches will be installed automatically when you install the patch kit. However, if you install the WLS subset after patching your system, you will have to rerun `dupatch` to install the WLS patches. The `dupatch` utility will see the WLS subset, recognize that the patches have not been installed, and will install them.

3.7 Removing Patches

To remove patches from your system, use the Patch Deletion option of the `dupatch` Main Menu. The system must be in single-user mode to remove patches. Note that the `-d` option to the `setld` command is disabled for patch subsets.

If you installed a new style patch kit, you cannot selectively remove patches; you must remove all of the patches delivered in that kit. For the old style patch kits, you can remove all or selective patches.

Caution

The Patch Deletion menu lists every `setld`-based patch on your system, regardless of which patch kit installed them. If you select the ALL of the above menu item, it will remove all `setld`-based patches from your system. Therefore, you want to remove all of the patches from a patch kit, for example Version 5.1B Patch Kit 4, but do not want to delete other installed `setld`-based patches, you will have to specify the patch ID of all of that kit's patches.

See Section C.2 for an example of the patch deletion process in which only the Patch Kit 4 patches are selected for removal.

The following sections describe actions you have to take if you decided to uninstall the patch kit.

3.7.1 Run Mandatory Script with New Style Patch Kits

If you enabled version switches as described in Section 3.6.1 for an inclusive patch kit, you must run the `/usr/sbin/versw_enable_delete` script before attempting to remove the patch kit. The steps for running this script require a complete cluster or single system shutdown, so choose a time when a shutdown will have the least impact on your operations. The following steps describe the procedure:

1. Make sure that all phases of the patch kit installation process have been completed.
2. Run `/usr/sbin/versw_enable_delete`:

```
# /usr/sbin/versw_enable_delete
```
3. Shut down the entire cluster or the single system.

4. Reboot the entire cluster or the single system.
5. Run `dupatch` on your single system or on a cluster using the rolling upgrade procedure to delete the patch kit.

Note

The next step requires that you reboot each cluster member to remove the patch kit. Because the no-roll procedure automatically reboots the system after deleting the patches, you would not be able to perform the next steps as required. Therefore, you cannot use the no-roll procedure to remove this patch kit.

6. Reboot the single system or each member of the cluster.

3.7.2 Changes to System May Need to Be Reversed

If you made the following changes to your system after installing the patch kit, you will have to undo those changes before you can uninstall the patch kit:

- If you changed your hardware configuration (for example, by adding a new disk), the system configuration that existed prior to installing the patch kit might not recognize the new devices or may not provide the necessary support for them.
- If you added new cluster members, the new members will not have an older state to revert to if you attempt to uninstall the patch kit.

To uninstall the patch kit, do the following:

1. Remove all new hardware and new cluster members that you added after installing the patch kit.
2. Run `dupatch` to uninstall the patch kit.
3. Verify that the patch kit was successfully uninstalled.

You can now add the cluster members you removed and reinstall the hardware you removed, as long as the support for it existed in the pre-patched system. You can also reinstall the patch kit.

3.7.3 Running `dupatch` to Remove Patches

The process for removing patches is similar to the one for installing them. Differences between the two procedures are described in the following list. :

1. Run `dupatch` and select 2 for patch removal:

```
# /patch/pk4/patch_kit/dupatch

Tru64 UNIX Patch Utility (Rev. 46-00)
=====
- This dupatch session is logged in /var/adm/patch/log/session.log

Main Menu:
-----

1) Patch Kit Installation
2) Patch Kit Deletion
3) Patch Kit Documentation

4) Patch Tracking
5) Patch Baseline Analysis/Adjustment

h) Help on Command Line Interface

q) Quit

Enter your choice: 2
```

2. Enter your name and any notes about the operation that you would like included in the log.
3. Select the patches that you want to remove:
 - Inclusive patch kits

With these kits you must select all of the patches in the kit. If you do not, you will receive an error message and no patches will be deleted. Refer to the Caution at the start of this section before beginning the procedure.

Patches in inclusive patch kits are identified with the letters SP and the number of the patch kit. For example, the patches in the Version 5.1B PK4 patch kit are identified as SP04.
 - Old style patch kits

With these kits, you can select the patches that you want to remove. If you want to remove all of the patches in a specific patch kit but leave any CSPs, ERPs, or patches from earlier kits, you will have to select each patch in the kit you want to remove. Refer to the Caution in Section 3.7 before beginning the procedure.
4. Rebuild the kernel. This step is the same as for the installation process. See Section 3.4 for details.
5. Review the session log to ensure the removal was successful. Note any special patch instructions, informational messages, and error messages. This is especially important to identify any actions that you may have to take (such as running a script) before rebooting your system.
6. Reboot the system. See Section 3.5 for details.

3.7.4 Script May Be Required on Certain Version 5.1B Systems

If removing a PK4 or higher patch kit restores your Version 5.1B system to a pre-patched state, you must run the script `/etc/dn_fix_dat.sh` before rebooting your system during the patch-deletion process. This would occur if the inclusive patch kit you are uninstalling is the only patch kit installed on your Version 5.1B system

You must also run this script if you are removing a specific patch from previous Version 5.1B patch kits if those kits are the only patch kit on your system. The affected patch in those kits will be noted in a Special Instruction that is displayed when you run the `dupatch` installation and deletion processes.

Failing to run this script will result in your system being unable to boot normally. If this occurs, do the following:

1. Boot your system in single-user mode:

```
>>> boot -fl s
```

2. Run the script:

```
# /etc/dn_fix_dat.sh
```

3. Reboot normally.

If you also need to reverse the version switch as described in Section 3.7.1, run the `/etc/dn_fix_dat.sh` script after step 5 in that process.

Rolling Upgrade

A rolling upgrade is a software upgrade of a cluster that is performed while the cluster is in operation. Patching your system is one type of upgrade that can be performed using this procedure. The term “Rolling Patch” is sometimes used to describe the patching process using the Rolling Upgrade procedure. In general, the terms Rolling Patch and Rolling Upgrade are synonymous in this chapter.

In a Rolling Upgrade, one member at a time is upgraded and returned to operation while the cluster transparently maintains a mixed-version environment for the base operating system, cluster, and Worldwide Language Support (WLS) software. Clients accessing services are not aware that a rolling upgrade is in progress.

A rolling upgrade consists of an ordered series of steps, called stages. The commands that control a rolling upgrade enforce this order.

When performing a rolling upgrade, the same procedure is used for patching your system as for upgrading to a new operating system or TruCluster version. The principal difference is that for a rolling patch you use the `dupatch` utility and for a rolling upgrade you use the `installupdate` utility during the install stage.

This chapter provides the same information as the Rolling Upgrade chapter of the *Cluster Installation* manual. It is provided here as a convenience so you can review your patching options in one manual.

Note

If you have not yet created your cluster, we recommend that you patch your system first. See Section 2.6.3 for this time-saving procedure.

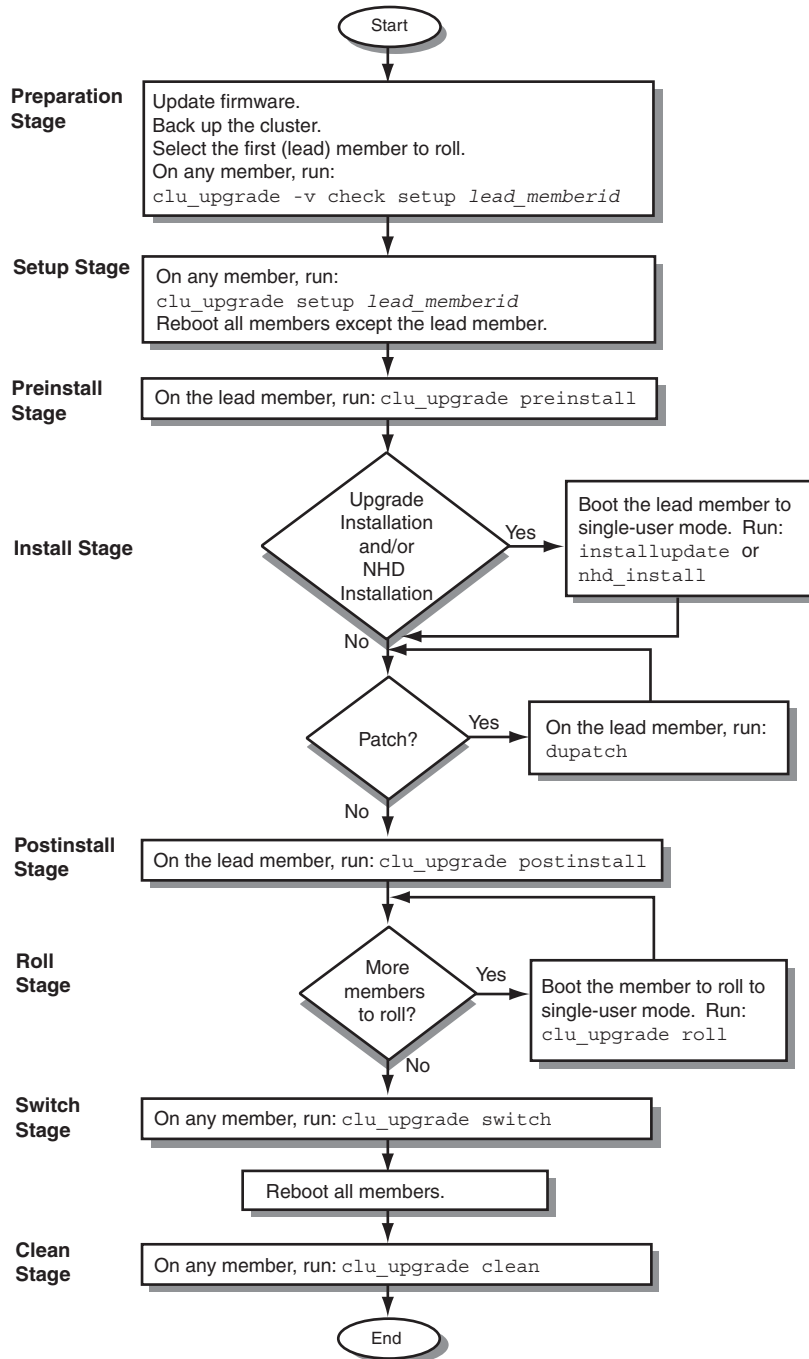
This first part of this chapter contains instructions for performing a rolling upgrade, for displaying the status of a rolling upgrade, and for undoing one or more stages of a rolling upgrade. Those interested in how a rolling upgrade works can find the details in Section 4.7 and the sections that follow it.

This chapter discusses the following topics:

- Tasks, and combinations of tasks, you can perform during a single rolling upgrade (Section 4.1)
- Tasks you cannot perform during a rolling upgrade (Section 4.2)
- How to perform a rolling upgrade (Section 4.3)
- How to display the status of a rolling upgrade (Section 4.5)
- How to undo the stages of a rolling upgrade (Section 4.6)
- The commands used during a rolling upgrade (Section 4.7)
- Rolling upgrade stages (Section 4.8)
- Two mechanisms that support rolling upgrades: tagged files (Section 4.9) and version switches (Section 4.10)
- Rolling upgrade and layered products (Section 4.11)
- Rolling upgrade and RIS (Section 4.12)

Figure 4-1 provides a simplified flow chart of the tasks and stages that are part of a rolling upgrade initiated on a Version 5.1B cluster:

Figure 4-1: Rolling Upgrade Flow Chart



ZK-1667U-AI

4.1 Rolling Upgrade Supported Tasks

The tasks that you can perform during a rolling upgrade depend on which versions of the base operating system and cluster software are currently running on the cluster. The main focus of this chapter is to describe the behavior of a rolling upgrade that starts on a TruCluster software Version 5.1B cluster. However, because you may read this chapter in preparation for a rolling upgrade from TruCluster software Version 5.1A to Version 5.1B, we point out rolling upgrade differences between the two versions.

- The following list describes the basic tasks you can perform within a rolling upgrade:
- Upgrade the cluster’s Tru64 UNIX base operating system and TruCluster software software. You perform this type of rolling upgrade to upgrade from the installed version to the next version.
- When performing a rolling upgrade of the base operating system and cluster software, you can roll only from one version to the next version. You cannot skip versions.

Note

A rolling upgrade updates the file systems and disks that the cluster currently uses. The roll does not update the disk or disks that contain the Tru64 UNIX operating system used to create the cluster (the operating system on which you ran `clu_create`). Although you can boot the original operating system in an emergency when the cluster is down, remember that the differences between the current cluster and the original operating system increase with each cluster update.

- Patch the cluster’s current versions of the Tru64 UNIX base operating system and TruCluster software software.
- Install a New Hardware Delivery (NHD) kit (the cluster must be running TruCluster software Version 5.1A or later).

Rolling in a patch kit or an NHD kit uses the same procedure as rolling in a new release of the base operating system and cluster software. The difference is which commands you run during the install stage:

- To upgrade the base operating system and cluster software, run `installupdate` in the install stage.
- To roll in a patch kit, run `dupatch` in the install stage. You can invoke `dupatch` multiple times in the install stage to roll in multiple patch kits.

If you want to perform a no-roll patch of the cluster, do not run the `clu_upgrade` command. Instead run the `dupatch` command from a cluster member running in multiuser mode.

No-roll patching applies patches quickly and reduces the number of reboots required. It patches the cluster in one operation. However, it requires a reboot of the whole cluster to complete the operation, so the cluster is unavailable for a period.

- To install an NHD kit, run `nhd_install` in the install stage.

Throughout this chapter, the term rolling upgrade refers to the overall procedure used to roll one or more software kits into a cluster.

As shown in Figure 4-1, you can perform more than one task during a rolling upgrade.

If the cluster is running Version 5.1A or Version 5.1B, a rolling upgrade can include the task combinations listed in Table 4-1:

Table 4-1: Rolling Upgrade Tasks Supported by Version 5.1A and Version 5.1B
An update installation from Version 5.1A to Version 5.1B
An update installation from Version 5.1B to the next release
A patch of Version 5.1A
A patch of Version 5.1B

Table 4-1: Rolling Upgrade Tasks Supported by Version 5.1A and Version 5.1B (cont.)

The installation of a New Hardware Delivery (NHD) kit onto a Version 5.1A cluster
The installation of an NHD kit onto a Version 5.1B cluster
An update installation from Version 5.1A to Version 5.1B of the base operating system and cluster software, followed by a patch of Version 5.1B
An update installation from Version 5.1B to the next release of the base operating system and cluster software followed by a patch of the next release ^a
An NHD installation onto a Version 5.1A cluster followed by a patch of Version 5.1A
An NHD installation onto a Version 5.1B cluster followed by a patch of Version 5.1B
An update installation from Version 5.1A to Version 5.1B followed by the installation of an NHD kit for Version 5.1B
An update installation from Version 5.1B to the next release of the base operating system and cluster software followed by the installation of an NHD kit for that next release ^b
An update installation from Version 5.1A to Version 5.1B, followed by the installation of an NHD kit for Version 5.1B, followed by a patch of Version 5.1B
An update installation from Version 5.1B to the next release, followed by the installation of an NHD kit for the next release, followed by a patch of the next release ^b

^a Within one rolling upgrade, you can combine an upgrade of the base operating system and cluster software with a patch of the new software. This means that during the install stage, you can run `installupdate` on the first member followed by `dupatch` to patch the newly installed software. When you roll the remaining members they automatically get both the new software and the patches.

However, you cannot patch the current software and then upgrade the base operating system and cluster software within one rolling upgrade. This operation requires two rolling upgrades.

^b Allowed only if you have already installed an NHD kit on the Version 5.1A or Version 5.1B cluster.

4.2 Unsupported Tasks

The following list describes tasks that you cannot perform or that we recommend you do not attempt during a rolling upgrade:

- Do not remove or modify files in the `/var/adm/update` directory. The files in this directory are critical to the roll. Removing them can cause a rolling upgrade to fail.
- During the install stage, you cannot run a `dupatch` command followed by an `installupdate` command. To patch the current software before you perform a rolling upgrade, you must perform two complete rolling upgrade operations: one to patch the current software, and one to perform the update installation.
- You cannot bypass versions when performing a rolling upgrade of the base operating system and cluster software. You can only roll from one version to the next version.
- Do not use the `/usr/sbin/setld` command to add or delete any of the following subsets:
 - Base Operating System subsets (those with the prefix `OSF`).
 - TruCluster Server subsets (those with the prefix `TCR`).
 - Worldwide Language Support (WLS) subsets (those with the prefix `IOS`).

Adding or deleting these subsets during a roll creates inconsistencies in the tagged files.

- Do not install a layered product during the roll.

Unless a layered product's documentation specifically states that you can install a newer version of the product on the first rolled member, and that the layered product knows what actions to take in a mixed-version cluster, we strongly recommend that you do not install either a new layered product or a new version of a currently installed layered product during a rolling upgrade.

For more information about layered products and rolling upgrades, see Section 4.11.

4.3 Rolling Upgrade Procedure

In the procedure in this section, unless otherwise stated, run commands in multiuser mode. Each step that corresponds to a stage refers to the section that describes that stage in detail. We recommend that you read the detailed description of stages in Section 4.8 before performing the rolling upgrade procedure.

Some stages of a rolling upgrade take longer to complete than others. Table 4-2 lists the approximate time it takes to complete each stage.

Table 4-2: Time Estimates for Rolling Upgrade Stages

Stage	Duration
Preparation	Not under program control.
Setup	45 - 120 minutes. ^a
Preinstall	15 - 30 minutes. ^a
Install	The same amount of time it takes to run <code>installupdate</code> , <code>dupatch</code> , <code>nhd_install</code> , or a supported combination of these commands on a single system.
Postinstall	Less than 1 minute.
Roll (per member)	Patch: less than 5 minutes. Update installation: about the same amount of time it takes to add a member. ^b
Switch	Less than 1 minute.
Clean	30 - 90 minutes. ^a

^a These stages create, verify, or remove the tagged files required for a rolling upgrade. The time that it takes to run one of these stages depends on the speed of the member executing the command, the speed of the storage, and whether the member executing the command is the CFS server for the root (/), /usr, and /var file systems. Consider relocating these file systems to the member where you will run the `clu_upgrade` command.

^b After rolling the lead member, use parallel rolls to roll multiple members simultaneously and shorten the time it takes to roll a cluster.

You can use the following procedure to upgrade a TruCluster software Version 5.1A cluster to Version 5.1B, and to upgrade a cluster that is already at Version 5.1B.

1. Prepare the cluster for the rolling upgrade (Section 4.8.1):
 - a. Choose one cluster member to be the lead member (the first member to roll). (The examples in this procedure use a member whose `memberid` is 2 as the lead member. The example member's host name is `provolone`.)
 - b. Back up the cluster.
 - c. If you will perform an update installation during the install stage, remove any blocking layered products, listed in Table 4-6, that are installed on the cluster.
 - d. To determine whether the cluster is ready for an upgrade, run the `clu_upgrade -v check setup lead_memberid` command on any cluster member. For example:

```
# clu_upgrade -v check setup 2
```

If a file system needs more free space, use AdvFS utilities such as `addvol` to add volumes to domains as needed. For disk space requirements, see Section 4.8.1. For information on managing AdvFS domains, see the Tru64 UNIX *AdvFS Administration* manual.

- e. Verify that each system's firmware will support the new software. Update firmware as needed before starting the rolling upgrade.
2. Perform the setup stage (Section 4.8.2).

Notes

If your current cluster is at Version 5.1A or later and if you plan to upgrade the base operating system and cluster software during the install stage, mount the device or directory that contains the new TruCluster software kit before running `clu_upgrade setup`. The setup command will copy the kit to the `/var/adm/update/TruClusterKit` directory.

If your current cluster is at Version 5.1A or later and if you plan to install an NHD kit during the install stage, mount the device or directory that contains the new NHD kit before running `clu_upgrade setup`. The setup command will copy the kit to the `/var/adm/update/NHDKit` directory.

On any member, run the `clu_upgrade setup lead_memberid` command. For example:

```
# clu_upgrade setup 2
```

Section 4.8.2 shows the menu displayed by the `clu_upgrade` command.

When the setup stage is completed, `clu_upgrade` prompts you to reboot all cluster members except the lead member.

3. One at a time, reboot all cluster members except the lead member. Do not start the preinstall stage until these members are either rebooted or halted.
4. Perform the preinstall stage (Section 4.8.3).

On the lead member, run the following command:

```
# clu_upgrade preinstall
```

If your current cluster is at Version 5.1A or later, the `preinstall` command gives you the option of verifying or not verifying the existence of the tagged files created during the setup stage.

- If you have just completed the setup stage and have done nothing to cause the deletion any of the tagged files, you can skip this test.
 - If you completed the setup stage a while ago and are not sure what to do, let `preinstall` test the correctness of the tagged files.
5. Perform the install stage (Section 4.8.4).

Note

During the install stage you load the new software on the lead member, in effect rolling that member. When you perform the roll stage, this new software is propagated to the remaining members of the cluster.

The `clu_upgrade` command does not load software during the install stage. The loading of software is controlled by the commands you run: `installupdate`, `dupatch`, or `nhd_install`.

See Table 4-1 for the list of rolling upgrade tasks and combination of tasks supported for Version 5.1A and Version 5.1B.

- a. See Chapter 3 for instructions on installing a patch kit using the `dupatch` command.

See the Tru64 UNIX *Installation Guide* for detailed information on using the `installupdate` command.

See the Tru64 UNIX *New Hardware Delivery Release Notes and Installation Instructions* that came with your NHD kit for detailed information on using the `nhd_install` command.

- b. If the software you are installing requires that its installation command be run from single-user mode, halt the system and boot the system to single-user mode:

```
# shutdown -h now
>>> boot -fl s
```

Note

Halting and booting the system ensures that it provides the minimal set of services to the cluster and that the running cluster has a minimal reliance on the member running in single-user mode. In particular, halting the member satisfies services that require the cluster member to have a status of DOWN before completing a service failover. If you do not first halt the cluster member, services will probably not fail over as expected.

When the system reaches single-user mode, run the following commands:

```
# init s
# bcheckrc
# lmf reset
```

- c. Run the `installupdate`, `dupatch`, or `nhd_install` command.

To roll in multiple patch kits, you can invoke `dupatch` multiple times in a single install stage. Be aware that doing so may make it difficult to isolate problems should any arise after the patch process is completed and the cluster is in use.

You cannot run a `dupatch` command followed by an `installupdate` command. To patch the current software before you perform a rolling upgrade, you must perform two complete rolling upgrade operations: one to patch the current software, and one to perform the update installation.

6. (Optional) After the lead member performs its final reboot with its new custom kernel, you can perform the following manual tests before you roll any additional members:

- a. Verify that the newly rolled lead member can serve the shared root (/) file system.
 - i. Use the `cfsmgr` command to determine which cluster member is currently serving the root file system. For example:

```
# cfsmgr -v -a server /

Domain or filesystem name = /
Server Name = polishham
Server Status : OK
```

- ii. Relocate the root (/) file system to the lead member. For example:

```
# cfsmgr -h polishham -r -a SERVER=provolone /
```

- b. Verify that the lead member can serve applications to clients. Make sure that the lead member can serve all important applications that the cluster makes available to its clients.

You decide how and what to test. We suggest that you thoroughly exercise critical applications and satisfy yourself that the lead member can serve these applications to clients before continuing the roll. For example:

- Manually relocate CAA services to the lead member. For example, to relocate the application resource named `cluster_lockd` to lead member `provolone`:

```
# caa_relocate cluster_lockd -c provolone
```

- Temporarily modify the default cluster alias selection priority attribute, `selp`, to force the lead member to serve all client requests directed to that alias. For example:

```
# cluamgr -a alias=DEFAULTALIAS,selp=100
```

The lead member is now the end recipient for all connection requests and packets addressed to the default cluster alias.

From another member or from an outside client, use services such as `telnet` and `ftp` to verify that the lead member can handle alias traffic. Test client access to all important services that the cluster provides.

When you are satisfied, reset the alias attributes on the lead member to their original values.

7. Perform the postinstall stage (Section 4.8.5).

On the lead member, run:

```
# clu_upgrade postinstall
```

8. Perform the roll stage (Section 4.8.6).

Roll the members of the cluster that have not already rolled.¹

You can roll multiple members simultaneously (parallel roll), subject to the restriction that the number of members not being rolled (plus the quorum disk, if one is configured) is sufficient to maintain cluster quorum.

To roll a member, do the following:

- a. Halt the member system and boot it to single-user mode. For example:

```
# shutdown -h now
>>> boot -fl s
```

- b. When the system reaches single-user mode, run the following commands:

```
# init s
# bcheckrc
# lmf reset
```

- c. Roll the member:

```
# clu_upgrade roll
```

If you are performing parallel rolls, use the `-f` option with the `clu_upgrade roll` command. This option causes the member to automatically reboot without first prompting for permission:

¹ The lead member was rolled during the install stage. Therefore, you do not perform the roll stage on the lead member.

```
# clu_upgrade -f roll
```

The roll command verifies that rolling the member will not result in a loss of quorum. If a loss of quorum will result, then the roll of the member does not occur and an error message is displayed. You can roll the member later, after one of the currently rolling members has rejoined the cluster and its quorum vote is available.

If the roll proceeds, the member is prepared for a reboot. If you used the `-f` option, no prompt is displayed; the reboot occurs automatically. If you did not use the `-f` option, `clu_upgrade` displays a prompt that asks whether you want to reboot at this time. Unless you want to examine something specific before you reboot, enter **yes**. (If you enter **yes**, it may take approximately half a minute before the actual reboot occurs.)

Perform parallel rolls to minimize the time needed to complete the roll stage. For example, on an eight-member cluster with a quorum disk, after rolling the lead member, you can roll four members in parallel.

- i. Begin the roll stage on a member. (The lead member was rolled during the install stage. You do not perform the roll stage on the lead member.)
- ii. When you see a message similar to the following, begin the roll stage on the next member:

```
*** Info ***
```

```
You may now begin the roll of another cluster member.
```

If you see a message that begins like the following, it is probably caused by the number of currently rolling members that contribute member votes.

```
*** Info ***
```

```
The current quorum conditions indicate that beginning  
a roll of another member at this time may result in  
the loss of quorum.
```

In this case, you have the following options:

- You can wait until a member completes the roll stage before you begin to roll the next member.
 - If there is an unrolled member that does not contribute member votes, you can begin the roll stage on it.
- d. Continue to roll members until all members of the cluster have rolled. Before starting each roll stage, wait until you see the message that it is all right to do so.

When you roll the last member, you will see a message similar to the following:

```
*** Info ***
```

```
This is the last member requiring a roll.
```

Note

The roll actually takes place during the reboot. The `clu_upgrade roll` command sets up the `it(8)` scripts that will be run during the reboot. When you reboot, the `it` scripts roll the member, build a customized kernel, and then reboot again so the member will be running on its new customized kernel. When the member boots its

new customized kernel, it has completed its roll and is no longer running on tagged files.

9. Perform the switch stage (Section 4.8.7).

After all members have rolled, run the `switch` command on any member.

```
# clu_upgrade switch
```

10. One at a time, reboot each member of the cluster.

11. Perform the clean stage (Section 4.8.8).

Run the following command on any member to remove the tagged (`.Old..`) files from the cluster and complete the upgrade.

```
# clu_upgrade clean
```

4.4 Removing Patches Installed During a Rolling Upgrade

The following sections provide important information you need to be aware of if you remove or reinstall patches during a rolling upgrade.

4.4.1 Caution on Removing Version Switched Patches

When removing version switched patches on a cluster, do not remove version switched patches that were successfully installed in a previous rolling upgrade.

This situation can occur because more than one patch subset may contain the same version switched patch. Although both the new and old patches can be removed during a roll, only the most recently installed, newer version switched patch can be properly removed.

The older version switched patch can only be properly removed according to the documented procedure associated with that patch. This usually requires running some program before beginning the rolling upgrade to remove the patch.

If you accidentally remove the older version switched patch, the rolling upgrade will most likely fail on the switch stage. To correct this situation, you will have to undo the upgrade by undoing all the stages up to and including the "install" stage. You will then need to reinstall the original version switched patch from the original patch kit that contained it.

4.4.2 Steps Prior to the Switch Stage

At any time prior to issuing the `clu_upgrade switch` command, you can remove some or all of the patches you installed during the rolling upgrade by returning to the install stage, rerunning `dupatch`, and selecting the Patch Deletion item in the Main Menu. See Section 3.7 for information about removing patches with `dupatch`.

You can also reinstall some or all of the patches you removed by rerunning `dupatch`.

After you are done running `dupatch`, you can then proceed to the postinstall stage by running the `clu_upgrade postinstall` command on the lead member.

See Section 4.6 for information about undoing any of the rolling upgrade stages.

4.4.3 Steps for After the Switch Stage

To remove patches after you have issued the `clu_upgrade switch` command, you will have to complete the current rolling upgrade procedure and then rerun the procedure from the beginning (starting with the setup stage).

When you run the install stage, you must bring down your system to single-user mode as described in steps 1 through 6 of Section 3.2.1. When you rerun `dupatch` (step 7), select the `Patch Deletion` item in the Main Menu. See Section 3.7 for information about removing patches with `dupatch`.

If the patch uses the version switch, you can still remove the patch, even after you have issued the `clu_upgrade switch` command. Do this as follows:

1. Complete the current rolling upgrade procedure.
2. Undo the patch that uses the version switch by following the instructions in the release note for that patch. Note that the last step to undo the patch will require a shutdown of the entire cluster.
3. Rerun the rolling upgrade procedure from the beginning (starting with the setup stage). When you rerun `dupatch`, select the `Patch Deletion` item in the Main Menu.

Use the `grep` command to learn which patches use the version switch. For example, in the C shell:

```
# grep -l PATCH_REQUIRES_VERSION_SWITCH="\Y\" /usr/.smdb./*PAT*.ctrl
```

For information about version switches, see Section 4.10.

Note

If you rerun the rolling upgrade procedure to remove patches, the prompts you receive during the setup stage will be different from those issued during the initial rolling upgrade. Those prompts will look as follows:

```
Do you want to continue to upgrade the cluster? [yes]: Return

What type of upgrade will be performed?

1) Rolling upgrade using the installupdate command
2) Rolling patch using the dupatch command
3) Both a rolling upgrade and a rolling patch
4) Exit cluster software upgrade

Enter your choice: 2
```

4.5 Displaying the Status of a Rolling Upgrade

The `clu_upgrade` command provides the following options for displaying the status of a rolling upgrade. You can run status commands at any time.

- To display the overall status of a rolling upgrade: `clu_upgrade -v` or `clu_upgrade -v status`.
- To determine whether you can run a stage: `clu_upgrade check [stage]`. If you do not specify a *stage*, `clu_upgrade` tests whether the next stage can be run.
- To determine whether a stage has started or completed: `clu_upgrade started stage` or `clu_upgrade completed stage`.
- To determine whether a member has rolled: `clu_upgrade check roll memberid`.
- To verify whether tagged files have been created for a layered product: `clu_upgrade tagged check [prod_code [prod_code ...]]`. If you do not specify a product code, `clu_upgrade` inspects all tagged files in the cluster.

During a roll, there might be two versions of the `clu_upgrade` command in the cluster — an older version used by members that have not yet rolled, and a newer version (if included in the update distribution or patch kit). The information that is displayed by the `status` command might differ depending on whether the command is run on a member that has rolled. Therefore, if you run the `status` command on two members, do not be surprised if the format of the displayed output is not the same.

If you run `clu_upgrade status` after running `installupdate`, `clu_upgrade` will display a message indicating that the install stage is complete. However, the install stage is not really complete until you run the `clu_upgrade postinstall` command.

4.6 Undoing a Stage

The `clu_upgrade undo` command provides the ability to undo a rolling upgrade that has not completed the switch stage. You can undo any stage except the switch stage and the clean stage. You must undo stages in order; for example, if you decide to undo a rolling upgrade after completing the preinstall stage, you undo the preinstall stage and then undo the setup stage.

Note

Before undoing any stage, we recommend that you read the relevant version of the *Cluster Release Notes* to determine whether there are restrictions related to the undoing of any stage.

To undo a stage, use the `undo` command with the stage that you want to undo. The `clu_upgrade` command determines whether the specified stage is a valid stage to undo. Table 4-3 outlines the requirements for undoing a stage:

Table 4-3: Undoing a Stage

Stage to Undo	Command	Comments
Setup	<code>clu_upgrade undo setup</code>	<p>You must run this command on the lead member. In addition, no members can be running on tagged files when you undo the setup stage.</p> <p>Before you undo the setup stage, use the <code>clu_upgrade -v status</code> command to determine which members are running on tagged files. Then use the <code>clu_upgrade tagged disable memberid</code> command to disable tagged files on those members. (See Section 4.9 for information about tagged files and the commands used to manipulate them.)</p> <p>When no members are running on tagged files, run the <code>clu_upgrade undo setup</code> command on the lead member.</p>
Preinstall	<code>clu_upgrade undo preinstall</code>	You must run this command on the lead member.
Install	<code>clu_upgrade undo install</code>	<p>You can run this command on any member except the lead member.</p> <p>Halt the lead member. Then run the <code>clu_upgrade undo install</code> command on any member that has access to the halted lead member's boot disk. When the command completes, boot the lead member.</p>

Table 4-3: Undoing a Stage (cont.)

Stage to Undo	Command	Comments
Postinstall	<code>clu_upgrade undo postinstall</code>	You must run this command on the lead member.
Roll	<code>clu_upgrade undo roll <i>memberid</i></code>	<p>You can run this command on any member except the member whose roll stage will be undone.</p> <p>Halt the member whose roll stage is being undone. Then run the <code>clu_upgrade undo roll <i>memberid</i></code> command on any other member that has access to the halted member's boot disk. When the command completes, boot the halted member. The member will now be using tagged files.</p>

4.7 Rolling Upgrade Commands

The `clu_upgrade` command, described in `clu_upgrade(8)`, controls the overall flow of a rolling upgrade and ensures that the stages are run in order. During the install stage, you run one or more of `installupdate`, `dupatch`, or `nhd_install` to load and install software. These commands are rolling upgrade aware; they are modified to understand which actions they are allowed to take during the install and roll stages of a rolling upgrade.

When you start a rolling upgrade, the cluster is running the software from the previous release. For the first part of any rolling upgrade, you are running the `clu_upgrade` command that is already installed on the cluster. If a new version is installed during the rolling upgrade, there may be minor differences in the on-screen display and behavior between the two versions of the command.

The following two tables show at which stages during a rolling upgrade new versions of upgrade commands, if shipped with the kits being installed, become available during a rolling upgrade:²

- Table 4-4 maps commands to stages for a rolling upgrade from Version 5.1A to Version 5.1B, a patch kit, or an NHD kit; or to Version 5.1B of the base operating system and cluster software followed by a patch of the new software within the same rolling upgrade.
- Table 4-5 maps commands to stages for a rolling upgrade from Version 5.1B to the next release of the operating system and cluster software, a Version 5.1B patch kit, or an NHD kit; or to the next release of the base operating system and cluster software followed by a patch of the new software within the same rolling upgrade.

Table 4-4: Stages and `clu_upgrade` Versions When Performing a Rolling Upgrade from Version 5.1A

Stage	Version 5.1A	Next Release ^a	Comments
Preparation	X		The currently installed (old) version of <code>clu_upgrade</code> is always run in this stage.

² The `clu_upgrade version` command displays the version number for `clu_upgrade`. The `clu_upgrade` version numbers do not correspond with the version numbers of the operating system.

Table 4-4: Stages and clu_upgrade Versions When Performing a Rolling Upgrade from Version 5.1A (cont.)

Stage	Version 5.1A	Next Release ^a	Comments
Setup	X		The currently installed (old) version of <code>clu_upgrade</code> is always run in this stage. If performing an update installation, the new version of the <code>clu_upgrade</code> is extracted from the TruCluster software kit and installed at <code>/usr/sbin/clu_upgrade</code> , replacing the old version. Because this replacement is done before tagged files are created, all members will use the new <code>clu_upgrade</code> throughout the remainder of the rolling upgrade.
Preinstall		X	If the rolling upgrade includes an update installation, all members use the new version of <code>clu_upgrade</code> installed during the setup stage. (Otherwise, members continue to run the current version of <code>clu_upgrade</code> .)
Install		X	If the rolling upgrade includes an update installation, all members use the version of <code>clu_upgrade</code> installed during the setup stage. During the update installation, a new version of <code>installupdate</code> replaces the old one. A patch kit always installs the latest version of <code>dupatch</code> . If performing a patch, and if the patch kit includes a new version of <code>clu_upgrade</code> , the new version is installed and will be used by all cluster members starting with the postinstall stage.
Postinstall		X	If a new version of <code>clu_upgrade</code> was installed in either the setup stage or the install stage, all members use the new version.
Roll		X	If a new version of <code>clu_upgrade</code> was installed in either the setup stage or the install stage, all members use the new version.
Switch		X	If a new version of <code>clu_upgrade</code> was installed in either the setup stage or the install stage, all members use the new version.
Clean		X	If a new version of <code>clu_upgrade</code> was installed in either the setup stage or the install stage, all members use the new version.

^a Version 5.1B of Tru64 UNIX and TruCluster software, a patch kit for Version 5.1A, or the installation of an NHD kit on Version 5.1A.

Table 4-5: Stages and clu_upgrade Versions When Performing a Rolling Upgrade from Version 5.1B

Stage	Version 5.1B	Next Release ^a	Comments
Preparation	X		The currently installed (old) version of <code>clu_upgrade</code> is always run in this stage.

Table 4-5: Stages and `clu_upgrade` Versions When Performing a Rolling Upgrade from Version 5.1B (cont.)

Stage	Version 5.1B	Next Release ^a	Comments
Setup	X		The currently installed (old) version of <code>clu_upgrade</code> is always run in this stage. If performing an update installation, the new version of the <code>clu_upgrade</code> is extracted from the TruCluster software kit and installed at <code>/usr/sbin/clu_upgrade</code> , replacing the old version. Because this replacement is done before tagged files are created, all members will use the new <code>clu_upgrade</code> throughout the remainder of the rolling upgrade.
Preinstall		X	If the rolling upgrade includes an update installation, all members use the new version of <code>clu_upgrade</code> installed during the setup stage. (Otherwise, members continue to run the current version of <code>clu_upgrade</code> .)
Install		X	If the rolling upgrade includes an update installation, all members use the version of <code>clu_upgrade</code> installed during the setup stage. During the update installation, a new version of <code>installupdate</code> replaces the old one. A patch kit always installs the latest version of <code>dupatch</code> . If performing a patch, and if the patch kit includes a new version of <code>clu_upgrade</code> , the new version is installed and will be used by all cluster members starting with the postinstall stage.
Postinstall		X	If a new version of <code>clu_upgrade</code> was installed in either the setup stage or the install stage, all members use the new version.
Roll		X	If a new version of <code>clu_upgrade</code> was installed in either the setup stage or the install stage, all members use the new version.
Switch		X	If a new version of <code>clu_upgrade</code> was installed in either the setup stage or the install stage, all members use the new version.
Clean		X	If a new version of <code>clu_upgrade</code> was installed in either the setup stage or the install stage, all members use the new version.

^a The next release of Tru64 UNIX and TruCluster software, a patch kit for Version 5.1B, or the installation of an NHD kit on Version 5.1B.

4.8 Rolling Upgrade Stages

The following sections describe each of the rolling upgrade stages.

Note

These sections only describe the stages. Use the procedure in Section 4.3 to perform a rolling upgrade.

- Preparation stage (Section 4.8.1)
- Setup stage (Section 4.8.2)
- Preinstall stage (Section 4.8.3)

- Install stage (Section 4.8.4)
- Postinstall stage (Section 4.8.5)
- Roll stage (Section 4.8.6)
- Switch stage (Section 4.8.7)
- Clean stage (Section 4.8.8)

4.8.1 Preparation Stage

Command	Where Run	Run Level
<code>clu_upgrade -v check setup lead_memberid</code>	any member	multiuser mode

During the preparation stage, you back up all important cluster data and verify that the cluster is ready for a roll. Before beginning a rolling upgrade, do the following:

1. Choose one member of the cluster as the first member to roll. This member, known as the lead member, must have direct access to the root (/), /usr, /var, and, if used, *il8n* file systems.

Make sure that the lead member can run any critical applications. You can test these applications after you update this member during the install stage, but before you roll any other members. If a problem occurs, you can try to resolve it on this member before you continue. If you cannot resolve a problem, you can undo the rolling upgrade and return the cluster to its pre-roll state. (Section 4.6 describes how to undo rolling upgrade stages.)
2. Back up the clusterwide root (/), /usr, and /var file systems, including all member-specific files in these file systems. If the cluster has a separate *il8n* file system, back up that file system. In addition, back up any other file systems that contain critical user or application data.

Note

If you perform an incremental or full backup of the cluster during a rolling upgrade, make sure to perform the backup on a member that is not running on tagged files. If you back up from a member that is using tagged files, you will only back up the contents of the *.Old..* files. Because the lead member never uses tagged files, you can back up the cluster from the lead member (or any other member that has rolled) during a rolling upgrade.

Most sites have automated backup procedures. If you know that an automatic backup will take place while the cluster is in the middle of a rolling upgrade, make sure that backups are done on the lead member or on a member that has rolled.

3. If you plan to run the `installupdate` command in the install stage, remove any blocking layered products listed in Table 4-6 that are installed on the cluster.
4. Run the `clu_upgrade -v check setup lead_memberid` command, which verifies the following information:
 - No rolling upgrade is in progress.
 - All members are running the same versions of the base operating system and cluster software.
 - No members are running on tagged files.

- There is adequate free disk space.
5. Verify that each system's firmware will support the new software. Update firmware as needed before starting the rolling upgrade.

A cluster can continue to operate during a rolling upgrade because two copies exist of the operating system and cluster software files. (Only one copy exists of shared configuration files so that changes made by any member are visible to all members.) This approach makes it possible to run two different versions of the base operating system and the cluster software at the same time in the same cluster. The trade-off is that, before you start an upgrade, you must make sure that there is adequate free space in each of the clusterwide root (/), /usr, and /var file systems, and, if a separate domain exists for the Worldwide Language Support (WLS) subsets, in the i18n file system.

A rolling upgrade has the following disk space requirements:

- At least 50 percent free space in root (/), `cluster_root#root`.
- At least 50 percent free space in /usr, `cluster_usr#usr`.
- At least 50 percent free space in /var, `cluster_var#var`, plus, if updating the operating system, an additional 425 MB to hold the subsets for the new version of the base operating system.
- If a separate i18n domain exists for the WLS subsets, at least 50 percent free space in that domain.
- No tagged files are placed on member boot partitions. However, programs might need free space when moving kernels to boot partitions. We recommend that you reserve at least 50 MB free space on each member's boot partition.

Note

You cannot use the `addvol` command to add volumes to a member's root domain (the a partition on the member's boot disk). Instead, you must delete the member from the cluster, use `diskconfig` or SysMan to configure the disk appropriately, and then add the member back into the cluster.

- See the *Patch Summary and Release Notes* that came with your patch kit to find the amount of space you will need to install that kit. If installing an NHD kit, see the *New Hardware Delivery Release Notes and Installation Instructions* that came with your NHD kit to find the amount of space you will need to install that kit.

If a file system needs more free space, use AdvFS utilities such as `addvol` to add volumes to domains as needed. For information on managing AdvFS domains, see the Tru64 UNIX *AdvFS Administration* manual. (The AdvFS Utilities require a separate license.) You can also expand the clusterwide root (/) domain.

Note

The `clu_upgrade` command verifies whether sufficient space exists at the start of a rolling upgrade. However, nothing prevents a cluster member from consuming disk space during a rolling upgrade, thus creating a situation where a later stage might not have enough disk space.

Disk space is dynamic. If you know that a member will be consuming disk space during a rolling upgrade, add additional space before you start the upgrade.

4.8.2 Setup Stage

Command	Where Run	Run Level
<code>clu_upgrade setup lead_memberid</code>	any member	multiuser mode

The setup stage performs the `clu_upgrade check setup` command, creates tagged files, and prepares the cluster for the roll.

The `clu_upgrade setup lead_memberid` command performs the following tasks:

- Creates the rolling upgrade log file, `/cluster/admin/clu_upgrade.log`.
- Makes the `-v check setup` tests listed in Section 4.8.1.
- Prompts you to indicate whether to perform an update installation, install a patch kit, install an NHD kit, or a combination thereof. The following example shows the menu displayed by the TruCluster software Version 5.1B `clu_upgrade` command:

What type of rolling upgrade will be performed?

```
Selection  Type of Upgrade
-----
1          An upgrade using the installupdate command
2          A patch using the dupatch command
3          A new hardware delivery using the nhd_install command
4          All of the above
5          None of the above
6          Help
7          Display all options again
-----
```

Enter your Choices (for example, 1 2 2-3):

- If you specify an update installation, copies the relevant kits onto disk:
 - If performing an update installation, copies the cluster kit to `/var/adm/update/TruClusterKit` so that the kit will be available to the `installupdate` command during the install stage. (The `installupdate` command copies the operating system kit to `/var/adm/update/OSKit` during the install stage.) The `clu_upgrade` command prompts for the absolute pathname for the TruCluster software kit location. On a TruCluster software Version 5.1B cluster, when performing a rolling upgrade that includes an update installation, remember to mount the TruCluster software kit before running the `clu_upgrade setup` command.
 - On a TruCluster software Version 5.1B cluster, if performing an NHD installation, uses the `nhd_install` command to copy the NHD kit to `/var/adm/update/NHDKit`

Caution

The files in `/var/adm/update` are critical to the roll process. Do not remove or modify files in this directory. Doing so can cause a rolling upgrade to fail.

- Creates the mandatory set of tagged files for the OSF (base), TCR (cluster), and IOS (Worldwide Language Support) products.

Caution

If, for any reason, during an upgrade you need to create tagged files for a layered product, see Section 4.9.

- Sets the `sysconfigtab` variable `rolls_ver_lookup=1` on all members except the lead member. When `rolls_ver_lookup=1`, a member uses tagged

files. As a result, the lead member can upgrade while the remaining members run on the `.Old.` files from the current release.

- Prompts you to reboot all cluster members except the lead member. When the `setup` command completes, reboot these members one at a time so that the cluster can maintain quorum. This reboot is required for each member that will use tagged files in the mixed-version cluster. When the reboots complete, all members except the lead member are running on tagged files.

4.8.3 Preinstall Stage

Command	Where Run	Run Level
<code>clu_upgrade preinstall</code>	lead member	multiuser mode

The purpose of the preinstall stage is to verify that the cluster is ready for the lead member to run one or more of the `installupdate`, `dupatch`, or `nhd_install` commands.

The `clu_upgrade preinstall` command performs the following tasks:

- Verifies that the command is being run on the lead member, that the lead member is not running on tagged files, and that any other cluster members that are up are running on tagged files.
- (Optional) Verifies that tagged files are present, that they match their product's inventory files, and that each tagged file's AdvFS property is set correctly. (This process can take a while, but not as long as it does to create the tagged files in the setup stage. Table 4-2 provides time estimates for each stage.)
- Makes on-disk backup copies of the lead member's member-specific files.

4.8.4 Install Stage

Command	Where Run	Run Level
<code>installupdate</code>	lead member	single-user mode
<code>dupatch</code>	lead member	single-user or multiuser mode
<code>nhd_install</code>	lead member	single-user mode

If your current cluster is running TruCluster software Version 5.1B or Version 5.1A, you can perform one of the tasks or combinations of tasks listed in Table 4-1.

The install stage starts when the `clu_upgrade preinstall` command completes, and continues until you run the `clu_upgrade postinstall` command.

Note

If you run `clu_upgrade status` after running `installupdate`, `clu_upgrade` displays a message indicating that the install stage is complete. However, the install stage is not really complete until you run the `clu_upgrade postinstall` command.

The lead member must be in single-user mode to run the `installupdate` command or the `nhd_install` command; single-user mode is recommended for the `dupatch` command. When taking the system to single-user mode, you must halt the system and then boot it to single-user mode.

When the system is in single-user mode, run the `init s`, `bcheckrc`, and `lmf reset` commands before you run the `installupdate`, `dupatch`, or `nhd_install` commands. See the Tru64 UNIX *Installation Guide*, the Tru64 UNIX and

TruCluster software, and the Tru64 UNIX *New Hardware Delivery Release Notes and Installation Instructions* for information on how to use these commands.

Notes

You can run the `dupatch` command multiple times in order to install multiple patches. Doing so may make isolating problems difficult if any arise after the patch process is completed and the cluster is in use.

During the install stage, you cannot run a `dupatch` command followed by an `installupdate` command. To patch the current software before you perform a rolling upgrade, you must perform two complete rolling upgrade operations: one to patch the current software, and one to perform the update installation.

If an NHD installation is part of a rolling upgrade that includes an update installation, you do not have to manually run `nhd_install`; the `installupdate` command will install the NHD kit. Otherwise, use the `nhd_install` command copied by `clu_upgrade` during the setup stage: `/var/adm/update/NHDKit/nhd_install`.

4.8.5 Postinstall Stage

Command	Where Run	Run Level
<code>clu_upgrade postinstall</code>	lead member	multiuser mode

The postinstall stage verifies that the lead member has completed an update installation, a patch, or an NHD installation. If an update installation was performed, `clu_upgrade postinstall` verifies that the lead member has rolled to the new version of the base operating system.

4.8.6 Roll Stage

Command	Where Run	Run Level
<code>clu_upgrade roll</code>	member being rolled	single-user mode

The lead member was upgraded in the install stage. The remaining members are upgraded in the roll stage.

In many cluster configurations, you can roll multiple members in parallel and shorten the time required to upgrade the cluster. The number of members rolled in parallel is limited only by the requirement that the members not being rolled (plus the quorum disk, if one is configured) have sufficient votes to maintain quorum. Parallel rolls can be performed only after the lead member is rolled.

The `clu_upgrade roll` command performs the following tasks:

- Verifies that the member is not the lead member, that the member has not already been rolled, and that the member is in single-user mode. Verifies that rolling the member will not result in a loss of quorum.
- Backs up the member's member-specific files.
- Sets up the `it(8)` scripts that will be run on reboot to perform the roll.
- Reboots the member. During this boot, the `it` scripts roll the member, build a customized kernel, and reboot with the customized kernel.

Note

If you need to add a member to the cluster during a rolling upgrade, you must add the member from a member that has completed its roll.

If a member goes down (and cannot be repaired and rebooted) before all members have rolled, you must delete the member to complete the roll of the cluster. However, if you have rolled all members but one, and this member goes down before it has rebooted in the roll stage, you must delete this member and then reboot any other member of the cluster. (The `clu_upgrade` command runs during reboot and tracks the number of members rolled versus the number of members currently in the cluster; `clu_upgrade` marks the roll stage as completed when the two values are equal. That is why, in the case where you have rolled all members except one, deleting the unrolled member and rebooting another member completes the roll stage and lets you continue the rolling upgrade.)

4.8.7 Switch Stage

Command	Where Run	Run Level
<code>clu_upgrade switch</code>	any member	multiuser mode All members must be up and running ^a

^a You can override this requirement by using the `-f` option to the `switch` command. However, all members' boot disks must be accessible for the `-f` option to work.

The `switch` stage sets the active version of the software to the new version, which results in turning on any new features that had been deliberately disabled during the rolling upgrade. (See Section 4.10 for a description of active version and new version.)

The `clu_upgrade switch` command performs the following tasks:

- Verifies that all members have rolled, that all members are running the same versions of the base operating system and cluster software, and that no members are running on tagged files.
- Sets the new version ID in each member's `sysconfigtab` file and running kernel.
- Sets the active version to the new version for all cluster members.

Note

After the `switch` stage completes, you must reboot each member of the cluster, one at a time.

4.8.8 Clean Stage

Command	Where Run	Run Level
<code>clu_upgrade clean</code>	any member	multiuser mode

The `clean` stage removes the tagged (`.Old.`) files from the cluster and completes the upgrade.

The `clu_upgrade clean` command performs the following tasks:

- Verifies that the `switch` stage has completed, that all members are running the same versions of the base operating system and cluster software, and that no members are running on tagged files.
- Removes all `.Old.` files.

- Removes any on-disk backup archives that `clu_upgrade` created.
- If the directory exists, recursively deletes `/var/adm/update/TruClusterKit`, `/var/adm/update/OSKit`, and `/var/adm/update/NHDKit`.
- If an update installation was performed, gives you the option of running the Update Administration Utility (`updadmin`) to manage the files that were saved during an update installation.
- Creates an archive directory for this upgrade, `/cluster/admin/clu_upgrade/history/release_version`, and moves the `clu_upgrade.log` file to the archive directory.

4.9 Tagged Files

A rolling upgrade updates the software on one cluster member at a time. To support two versions of software within the cluster during a roll, `clu_upgrade` creates a set of tagged files in the setup stage.

A tagged file is a copy of a current file with `.Old.` prepended to the copy filename, and an AdvFS property (`DEC_VERSION_TAG`) set on the copy. For example, the tagged file for the `vdump` command is named `/sbin/.Old.vdump`. Because tagged files are created in the same file system as the original files, you must have adequate free disk space before beginning a rolling upgrade.

Whether a member is running on tagged files is controlled by that member's `sysconfigtab rolls_ver_lookup` variable. The upgrade commands set the value to 1 when a member must run on tagged files, and to 0 when a member must not run on tagged files.

If a member's `sysconfigtab rolls_ver_lookup` attribute is set to 1, pathname resolution includes determining whether a specified filename has a `.Old.filename` copy and whether the copy has the `DEC_VERSION_TAG` property set on it. If both conditions are met, the requested file operation is transparently diverted to use the `.Old.filename` version of the file. Therefore, if the `vdump` command is issued on a member that has not rolled, the `/sbin/.Old.vdump` file is executed; if the command is issued on a member that has rolled, the `/sbin/vdump` file is executed. The only member that never runs on tagged files is the lead member (the first member to roll).

Note

File system operations on directories are not bound by this tagged file restraint. For example, an `ls` of a directory on any cluster member during a rolling upgrade lists both versions of a file. However, the output of an `ls -ail` command on a member that has not rolled is different from the output on a member that has rolled. In the following examples the `ls -ail` command is run first on a member that has not rolled and then on a member that has rolled. (The `awk` utility is used to print only the inode, size, month and day timestamp, and name of each file.)

The following output from the `ls` command is taken from a cluster member running with tags before it has rolled. The tagged files are the same as their untagged counterparts (same inode, size, and timestamp). When this member runs the `hostname` command, it runs the tagged version (inode 3643).

```
# cd /sbin
# ls -ail hostname .Old.hostname ls .Old.ls init .Old.init | \
awk '{printf("%d\t%d\t%s %s\t%s\n",$1,$6,$7,$8,$10)}'
```

3643	16416	Aug 24	.Old.hostname
3648	395600	Aug 24	.Old.init
3756	624320	Aug 24	.Old.ls

```

3643 16416 Aug 24 hostname
3648 395600 Aug 24 init
3756 624320 Aug 24 ls

```

The following output from the `ls` command is taken from a cluster member running without tags after it has rolled. The tagged files now differ from their untagged counterparts (different inode, size, and timestamp). When this member runs the `hostname` command, it runs the non-tagged version (inode 1370).

```

# cd /sbin
# ls -ail hostname .Old..hostname ls .Old..ls init .Old..init |\
awk '{printf("%d\t%d\t%s %s\t%s\n",$1,$6,$7,$8,$10)}'

```

```

3643 16416 Aug 24 .Old..hostname
3648 395600 Aug 24 .Old..init
3756 624320 Aug 24 .Old..ls
1187 16528 Mar 12 hostname
1370 429280 Mar 12 init
1273 792640 Mar 12 ls

```

After you create tagged files in the setup stage, we recommend that you run any administrative command, such as `tar`, from a member that has rolled. You can always run commands on the lead member because it never runs on tagged files.

The following rules determine which files have tagged files automatically created for them in the setup stage:

- Tagged files are created for inventory files for the following product codes: base operating system (OSF), TruCluster software (TCR), and Worldwide Language Support (IOS). (The subsets for each product use that product's three-letter product code as a prefix for each subset name. For example, TruCluster software subset names start with the TruCluster software three-letter product code: TCRBASE510, TCRMAN510, and TCRMIGRATE510.)
- By default, files that are associated with other layered products do not have tagged files created for them. Tagged files are created only for layered products that have been modified to support tagged files during a rolling upgrade.

Caution

Unless a layered product's documentation specifically states that you can install a newer version of the product on the first rolled member, and that the layered product knows what actions to take in a mixed-version cluster, we strongly recommend that you do not install either a new layered product or a new version of a currently installed layered product during a rolling upgrade.

The `clu_upgrade` command provides several tagged command options to manipulate tagged files: `check`, `add`, `remove`, `enable`, and `disable`. When dealing with tagged files, take the following into consideration:

- During a normal rolling upgrade you do not have to manually add or remove tagged files. The `clu_upgrade` command calls the tagged commands as needed to control the creation and removal of tagged files.
- If you run a `clu_upgrade tagged` command, run the `check`, `add`, and `remove` commands on a member that is not running on tagged files; for example, the lead member. You can run the `disable` and `enable` commands on any member.
- The target for a `check`, `add`, or `remove` tagged file operation is a product code that represents an entire product. The `clu_upgrade tagged` commands operate on all inventory files for the specified product or products. For example, the following command verifies the correctness of all the tagged files created for the TCR kernel layered product (the TruCluster software subsets):

```
# clu_upgrade tagged check TCR
```

If you inadvertently remove a `.Old..` copy of a file, you must create tagged files for the entire layered product to re-create that one file. For example, the `vdump` command is in the `OSFADVFSxxx` subset, which is part of the OSF product. If you mistakenly remove `/sbin/.Old..vdump`, run the following command to re-create tagged files for the entire layered product:

```
# clu_upgrade tagged add OSF
```

- The `enable` and `disable` commands enable or disable the use of tagged files by a cluster member. You do not have to use `enable` or `disable` during a normal rolling upgrade.

The `disable` command is useful if you have to undo the setup stage. Because no members can be running with tagged files when undoing the setup stage, you can use the `disable` command to disable tagged files on any cluster member that is currently running on tagged files. For example, to disable tagged files for a member whose ID is 3:

```
# clu_upgrade tagged disable 3
```

The `enable` command is provided in case you make a mistake with the `disable` command.

4.10 Version Switch

A version switch manages the transition of the active version to the new version of an operating system. The active version is the one that is currently in use. The purpose of a version switch in a cluster is to prevent the introduction of potentially incompatible new features until all members have been updated. For example, if a new version introduces a change to a kernel structure that is incompatible with the current structure, you do not want cluster members to use the new structure until all members have updated to the version that supports it.

At the start of a rolling upgrade, each member's active version is the same as its new version. When a member rolls, its new version is updated. After all members have rolled, the switch stage sets the active version to the new version on all members. At the completion of the upgrade, all members' active versions are again the same as their new versions. The following simple example uses an active version of 1 and a new version of 2 to illustrate the version transitions during a rolling upgrade:

```
All members at start of roll:   active (1)  = new (1)
Each member after its roll:     active (1) != new (2)
All members after switch stage: active (2)  = new (2)
```

The `clu_upgrade` command uses the `versw` command, which is described in `versw(8)`, to manage version transitions. The `clu_upgrade` command manages all the version switch activity when rolling individual members. In the switch stage, after all members have rolled, the following command completes the transition to the new software:

```
# clu_upgrade switch
```

4.11 Rolling Upgrade and Layered Products

This section discusses the interaction of layered products and rolling upgrades:

- General guidelines (Section 4.11.1)
- Blocking layered products (Section 4.11.2)

4.11.1 General Guidelines

The `clu_upgrade setup` command prepares a cluster for a rolling upgrade of the operating system. Do not use the `setld` command to load software onto the cluster between performing the `clu_upgrade setup` command and rolling the first cluster member to the new version. If you install software between performing the `clu_upgrade setup` command and rolling a cluster member to the new version, the new files will not have been processed by `clu_upgrade setup`. As a result, when you roll the first cluster member, these new files will be overwritten.

If you must load software:

- Wait until at least one member has rolled.
- Install the software on a member that has rolled.

4.11.2 Blocking Layered Products

A blocking layered product is a product that prevents the `installupdate` command from completing. Blocking layered products must be removed from the cluster before starting a rolling upgrade that will include running the `installupdate` command. You do not have to remove blocking layered products when performing a rolling upgrade solely to patch the cluster or install an NHD kit.

Table 4-6 lists blocking layered products for this release.

Table 4-6: Blocking Layered Products

Product Code	Description
3X0	Open3D
4DT	Open3D
ATM	Atom Advanced Developers Kit
DCE	Distributed Computing Environment
DNA	DECnet
DTA	Developer's Toolkit (Program Analysis Tools)
DTC	Developer's Toolkit (C compiler)
MME	Multimedia Services
O3D	Open 3D
PRX	PanoramiX Advanced Developers Kit

Notes

The three-letter product codes are the first three letters of subset names. For example, a subset named `ATMBASExxx` is part of the ATM product (Atom Advanced Developers Kit), which is a blocking layered product. However, a subset named `OSFATMBINxxx` contains the letters ATM, but the subset is not part of a blocking layered product; it is a subset in the OSF product (the base operating system).

When a blocking layered product is removed as part of the rolling upgrade, it is removed for all members. Any services that rely on the blocking product will not be available until the roll completes and the blocking layered product is reinstalled.

4.12 Rolling Upgrade and RIS

When performing the install stage of a rolling upgrade, you can load the base operating system subsets from a CD-ROM or from a Remote Installation Services (RIS) server.

Note

You can use RIS only to load the base operating system subsets.

To use RIS, you must register both the lead member and the default cluster alias with the RIS server. When registering for operating system software, you must provide a hardware address for each host name. Therefore, you must create a hardware address for the default cluster alias in order to register the alias with the RIS server. (RIS will reject an address that is already in either of the RIS server's `/etc/bootptab` or `/var/adm/ris/clients/risdb` files.)

If your cluster uses the cluster alias virtual MAC (vMAC) feature, register that virtual hardware address with the RIS server as the default cluster alias's hardware address. If your cluster does not use the vMAC feature, you can still use the algorithm that is described in the vMAC section of the *Cluster Administration* manual to manually create a hardware address for the default cluster alias.

A vMAC address consists of a prefix (the default is AA:01) followed by the IP address of the alias in hexadecimal format. For example, the default vMAC address for the default cluster alias `deli` whose IP address is `16.140.112.209` is `AA:01:10:8C:70:D1`. The address is derived in the following manner:

Default vMAC prefix:	AA:01
Cluster Alias IP Address:	16.140.112.209
IP address in hex. format:	10.8C.70.D1
vMAC for this alias:	AA:01:10:8C:70:D1

Another method for creating a hardware address is to append an arbitrary string of eight hexadecimal numbers to the default vMAC prefix, `AA:01`. For example, `AA:01:00:00:00:00`. Make sure that the address is unique within the area served by the RIS server. If you have more than one cluster, remember to increment the arbitrary hexadecimal string when adding the next alias. (The vMAC algorithm is useful because it creates an address that has a high probability of being unique within your network.)

No-Roll Patching

The no-roll patch process lets you install patches on a cluster without performing a rolling upgrade. This chapter provides the following information:

- An overview of the no-roll patch process (Section 5.1)
- A step-by-step description of the process as it differs from a normal `dupatch` session (Section 5.2)
- Throwing the version switch (Section 5.3)
- How to remove patches from a cluster using the no-roll patch method (Section 5.4)

Note

The no-roll technology is included in Rev. 34-00 and higher of the `dupatch` utility. You can find the revision number on the first output line you see when you run `dupatch` (see the example in Section 5.2). The first kit that includes this technology was issued in April 2002.

5.1 Overview

A rolling upgrade lets you perform a software upgrade on a cluster while maintaining high availability of the cluster. To provide this high availability, a certain amount of setup work is required to build tagged files and to reboot the cluster members to use the tagged files. This can take a considerable amount of time.

However, if you have a mission-critical environment and want to use a patch method that applies patches quickly, minimizes down time of the cluster, and reduces the number of reboots required, you might want to use the no-roll patch process. This process patches your cluster in one operation that requires only one or two reboots of the whole cluster to complete the operation. You will need the second reboot only if you install a patch that contains a version switch (see Section 5.3).

The no-roll patch process is a modification of `dupatch`; that is, all patches are installed or removed entirely using the `dupatch` utility, as opposed to the `clu_upgrade` and `dupatch` utilities used in the rolling upgrade procedure. The no-roll process conducts significantly fewer operations than the rolling upgrade procedure.

While a no-roll patch installation is in progress, no other critical operations should be running on the cluster because the cluster will change state and reboot automatically at various stages of the procedure.

In addition, the no-roll patch procedure employs the use of the Tru64 UNIX Event Management System (EVM) to send cluster-wide events. As a result, patches must be applied to the system in multiuser mode. If you attempt to use the no-roll procedure while in single-user mode, you will be advised to change the cluster to multiuser mode before continuing.

5.2 Steps for Running a No-Roll Procedure

The following steps describe how to patch your cluster using the no-roll procedure.

NOTE

To use the no-roll patch method, you must not use the `clu_upgrade` utility to prepare the cluster, as you would for a rolling upgrade prior to running `dupatch`. If a rolling upgrade is in progress before attempting to run `dupatch`, then the no-roll option will not be available until the cluster is restored to the state prior to the roll attempt.

1. With your system running in multiuser mode, enter the `dupatch` command:

```
# dupatch
Tru64 UNIX Patch Utility (Rev. 46-00)
=====
- This dupatch session is logged in /var/adm/patch/log/session.log

Main Menu:
-----

1) Patch Kit Installation
2) Patch Kit Deletion
3) Patch Kit Documentation

4) Patch Tracking
5) Patch Baseline Analysis/Adjustment

h) Help on Command Line Interface

q) Quit

Enter your choice:
```

2. From the main menu select the patch installation or patch deletion option. (See Section 3.2.2.)
3. If `dupatch` determines it is running on a cluster that has not been prepared to do a rolling patch, it asks if you want to do the patch operation without rolling. You will see a message similar to the following:

```
Checking Cluster State...done
This system is part of a cluster which has not been prepared to do a rolling patch
installation or deletion. Do you wish to perform this patch operation cluster-wide
without using the rolling-patch mechanism?

Please answer y or n ? [y/n]:
```

If you choose `y`, `dupatch` proceeds by allowing you to do the analysis and selection of patches to be installed or removed, after which the whole cluster is brought down to `init` level 2 via an Event Management System event.

If you are using `dupatch` from the command line and do not specify the `-proceed` option, you will need to press `Return` in order to transition the cluster from level 3 to level 2. If the `-proceed` option was set, the transition will occur automatically.

After `dupatch` completes its patch analysis, it will perform the patch operation on the member on which you ran `dupatch`. After the patches are installed or removed, `dupatch` will issue a second event to the remaining cluster members that will instruct them to complete their patch operations in parallel.

The `dupatch` utility then waits a calculated time-out period for all the other cluster members to complete their operations. The time-out period is based on the time it took to perform the patch operation on the member running `dupatch`.

After the patch operation is completed on all other cluster members, `dupatch` will complete the procedure on the member on which the `dupatch` command was issued.

If a cluster member times out or encounters an error, `dupatch` will report the problem, suspend the process, and send you a message to check the problematic member in order to resolve the problem. Once `dupatch` has resumed, it will complete the patch process on the rest of the cluster.

If a cluster member is known to be down when you issue the `dupatch` command, an `/sbin/it` job will be posted for the member to run the cluster patch script upon reboot. (For more information, see the `it(8)` reference page.)

Because all patches currently require a reboot, the whole cluster will reboot after all the members report back.

5.3 Throwing the Version Switch

If a patch applied to the system requires the use of a version switch, you will see a message similar to the following at the end of the `dupatch` session:

```
*****
Patch OSFPAT00074200510 has been
identified as needing a version switch. Once the following reboot is
complete, please enter the "/var/adm/patch/noroll/noroll_versw"
command from any cluster member.
*****
```

As indicated by the message, you must enter the `/var/adm/patch/noroll/noroll_versw` command from any cluster member. This is a manual operation that you must perform after the reboot is complete. All cluster members must be up prior to running the `noroll_versw` command. If they are not, the `noroll_versw` command will fail and the version switch will not take place.

After issuing the `noroll_versw` command, reboot your system to ensure system integrity.

5.4 Removing Patches

The capability of the no-roll process to remove patches depends on whether you want to remove a new style or old style patch kit:

- Inclusive patch kits

You cannot use the no-roll process to remove inclusive patch kits because you must run the `versw_enable_delete` script (Section 3.7.1), which requires that you reboot each cluster member to remove the patch kit. Because the no-roll process automatically reboots the system after deleting the patches, you would not be able to reboot each member as required.

- Old style patch kits

You can use the no-roll patch process to remove patches from old style patch kits from a cluster regardless of whether the patches were installed on the cluster using the no-roll or the rolling upgrade procedures. However, if the version switch was thrown after the installation of the patches, it is necessary to undo the version switch as described in the instructions in Section 4.4 prior to attempting to remove the patch requiring the version switch.

Viewing Log files

The dupatch utility captures patching activities in the following log files:

- /var/adm/patch/log/session.log

Every time you run dupatch it creates a session log that captures dupatch activities. The session.log files from the previous 25 sessions are saved. The order is first in, first out, with session.log.25 as the oldest file.

- /var/adm/patch/log/Dupatch_load_Date.log

When you run dupatch from the newly untarred kit or from the mounted Tru64 UNIX Patch CD-ROM, dupatch determines if the patch distribution contains new patch tools, and loads them if necessary.

This log file has a name similar to this:

Dupatch_load_2000Jul1:15:43:35.log

- /var/adm/patch/log/baseline.log

When you run the system baselining feature, dupatch creates a baseline log. The session.log files from the previous 25 sessions are saved. The order is first in, first out, with baseline.log.25 as the oldest file.

- /var/adm/patch/log/event.log

When patches are installed or removed, an event log captures that information. Only one copy of the file is updated each time patches are installed or removed. The information in the patch event log is not available through the dupatch user interface, but the log is a text file that you can view with a command such as more. The following list describes the types of information an event log provides, although the format and content are subject to change. Example A-1 shows a typical event log.

DUPATCH_REV>	The revision of dupatch being used
TYPE>	The type of action that was taken; either install or remove
NAME>	The name entered by the user through a dupatch query
USER>	The name of the user performing the action
NOTES>	Notes that were entered by the user through a dupatch query
KITLOC>	The directory from which the patch kit was installed
KITNAME>	The name of the patch kit that was installed
REVERT>	The choice made on whether or not the patch installation is reversible
BACKUP_DIRECTORY>	A pointer to the directory that contains the original files before they were patched
BACKUP_SETUP>	A plain directory; not a mount point or a symbolic link
SUCCEEDED>	A list of patches for which the action succeeded
FAIL>	A list of patches for which the action failed

Example A-1: Sample Event Log

```
<RECORD>
DUPATCH_REV>30-01
TYPE>install
NAME>mstone
USER>mstone
DATE>Mon Jul 3 13:03:33 EST 2000
NOTES>Install BL13 patches from CD-ROM
>
KITLOC>/cdrom/DIGITAL_UNIX_V4.0F/patch_kit/DIGITAL_UNIX_V4.0F/kit
KITNAME><DUV40FAS0004-20000613> OSF440
REVERT>Y
BACKUP_DIRECTORY>//var/adm/patch/backup
BACKUP_SETUP>
SUCCEED>OSFPAT00001900440
```

Common Error, Warning, and Informational Messages

This appendix describes error, warning, and informational messages for the dupatch utility. The following information is provided for each message:

Source: The function that generates the message.

Problem: A brief description of possible causes for the message.

Causes: A summary of situations that cause the message.

Action: General recovery guidance.

Output: A sample of the message.

B.1 Patch Preinstallation Check and Installation Messages

The following sections describe messages you might see when running the dupatch preinstallation check or installation functions.

B.1.1 Patch Installation Blocked by Unknown System File

Source: dupatch preinstallation check or installation.

Problem: The installation of a specific patch is blocked due to an existing system file that is unknown.

Cause: This situation usually occurs when system files are placed on the system through manual intervention. For example, this may have been the result of installing a Customer-Specific patch received from HP Services or a system administrator's customization of a Tru64 UNIX file.

Until you confirm otherwise, the unknown system files should be viewed as intentional customizations that are important for proper system operation. As such, care should be taken to understand why the system files have been customized.

Action: Determine the origin of the existing unknown system files. The steps you take will be determined by the reason your system files were manually changed. See Section 1.7 for more information.

Output:

```
Checking patch prerequisites and patch file applicability ...
(dependent upon the number of patches you select, this may take a while)
-----
Problem installing:

- DIGITAL_UNIX_V4.0F / Common Desktop Environment (CDE) Patches:

    Patch 0326.00 - CDE Login Correction

    ./usr/dt/bin/dtwm:
        its origin cannot be identified.

This patch will not be installed.
-----
* Following patch(es) failed in prerequisite/file applicability check:

- TRU64_UNIX_V4.0D / Common Desktop Environment (CDE) Patches:
    Patch 0326.00 - CDE Login Correction
```

B.1.2 Patch Installation Blocked by Missing System File

Source: dupatch preinstallation check or installation.

Problem: Installation of a specific patch is blocked due to missing system file.

Causes: This situation usually occurs when a system file that was installed with setld is manually removed from the system. The file is marked as installed in the system inventory records.

Action: Determine why the system file is missing and whether it is safe to enable dupatch to install the blocked patch. See Section 1.7 for more information.

Output:

```
Checking patch prerequisites and patch file applicability...
(depend upon the number of patches you select, this may take a while)
-----

Problem installing:

- DIGITAL_UNIX_V4.0F / Commands, Shells, & Utility Patches:
  Patch 0236.00 - vi Editor Correction

./usr/bin/vedit:
  does not exist on your system,
  however, it is in the inventory of installed subsets.

This patch will not be installed.

-----
* Following patch(es) failed in prerequisite/file applicability check:

- DIGITAL_UNIX_V4.0F / Commands, Shells, & Utility Patches:
  Patch 0236.00 - vi Editor Correction
```

B.1.3 Installation Blocked by Layered Product Collision

Source: dupatch preinstallation check or installation.

Problem: The installation of a specific patch is blocked due to an existing system file that is installed by a layered product.

Causes: A small set of layered products deliver updated Tru64 UNIX operating system files.

Action: To resolve this situation contact the Product Customer Services representative.

Output:

```
Checking patch prerequisites and patch file applicability...
(depend upon the number of patches you select, this may take a while)
-----

Problem installing:

- TRU_UNIX_V4.0F / Network Patches:
  Patch 0182.00 - xti/streams Interface Module Correction

./sys/BINARY/xtiso.mod:
  is installed by:

                                BLTLPCONFLICTTEST410

                                and can not be replaced by this patch.

This patch will not be installed.

-----
```

```

* Following patch(es) failed in prerequisite/file applicability check:

- DIGITAL_UNIX_V4.0F / Network Patches:
  Patch 0182.00 - xti/streams Interface Module Correction

```

B.1.4 Patch Installation Blocked by Dependencies on Other Patches

Source: dupatch preinstallation check or installation.

Problem: The installation of a specific patch is blocked due to its dependency on other uninstalled patches.

Causes: This usually occurs when you miss the selection of all dependent patches. It only occurs in old style patch kits.

Action: Through the dupatch Installation Menu, take one of the following actions:

- Reselect the patches including the noted dependent patch and attempt reinstallation; dupatch will notify you of other missing dependent patches.
- Select all patches and proceed with patch installation.

Output:

```

SAMPLE OUTPUT:

Checking patch prerequisites and patch file applicability...
(dependent upon the number of patches you select, this may take a while)
-----

Problem installing:

- DIGITAL_UNIX_V4.0F / Security Related Patches:
  Patch 0579.01 - Security, Various Kernel Fixes (SSRT0482U)

requires the existence of the following un-installed/un-selected subset(s):

- TruCluster_V1.6 / Filesystem Patches:
  Patch 0037.00 - Support For New AdvFS Mount Option "-o noatimes"

- TruCluster_V1.6 / ASE Availability Manager (AM) Patches:
  Patch 0033.00 - Kern Mem Fault And simple_lock Panic Correction

This patch will not be installed.

-----
* Following patch(es) failed in prerequisite/file applicability check:

- TRU64L_UNIX_V4.0F / Security Related Patches:
  Patch 0579.01 - Security, Various Kernel Fixes (SSRT0482U)

```

B.1.5 Patch Installation Blocked by Missing Product Subset

Source: dupatch preinstallation check or installation.

Problem: A specific patch cannot be installed because the product software subset is not installed on your system.

Causes: This is usually an informational message and no further action is required. However, this message may also occur due to an internal patch kit error that results in an incorrectly specified patch dependency.

Action: If the specific patch being blocked is the only patch being blocked you can assume this is an informational message. It may be an internal patch kit error if there are other patches whose installation is blocked by the patch whose subset is not installed. As a workaround, if you need one of the other patches whose installation is blocked, you can install the optional Tru64 UNIX or TCR release subset and reinstall the patches.

Output:

```
Checking patch prerequisites and patch file applicability...
(dependent upon the number of patches you select, this may take a while)
-----

Problem installing:

- TruCluster_V1.6 / Cluster Kernel Patches:
  Patch 0035.00 - rm_spur Driver Correction

requires the existence of the following un-installed/un-selected subset(s):

- TruCluster_V1.6 - subset: TCRMCA141

This patch will not be installed.

-----
* Following patch(es) failed in prerequisite/file applicability check:

- TruCluster_V1.6 / Cluster Kernel Patches:
  Patch 0035.00 - rm_spur Driver Correction
```

B.1.6 Patch Installation Blocked by Disk Space

Source: dupatch preinstallation check or installation.

Problem: The system disk did not have enough space to install patches.

Causes: This occurs when there is not enough disk space in /, /var, or /usr partitions for dupatch to archive the existing system files and move the patched files into place.

Action: Provide the necessary disk space and reinstall patches. If you cannot provide enough system disk space through other means, you may want to make /var/adm/patch/backup a symbolic link to or NFS-mount another file system that is not related to the /, /var, or /usr partitions.

Output:

```
Checking patch prerequisites once more...
(dependent upon the number of patches you select, this may take a while)

./usr/sbin/fitset:
file system /whd needs 65829 Kbytes more to install the software specified.

There is not enough file system space to install all the patches.
you have selected.

Please press RETURN to start another selection.
.
.
.
```

B.1.7 Patch Installation Blocked by Installed Patch or Subset

Source: dupatch preinstallation check or installation.

Problem: The patch you are trying to install is built so it cannot supersede the later revision patch or subset that is installed on your system.

Causes: This applicability feature is used to ensure that your system is not regressed through the installation of older code.

Action: If the situation is caused by a Release patch being blocked by a layered product or other subsets, contact your service provider.

Output:

```
Problem installing:

- DIGITAL_UNIX_V4.0D / Filesystem Patches:
```

```

Patch 00016.01 - System Run Level Correction

./sbin/.new..bcheckrc:
    is installed by:

- DIGITAL_UNIX_V4.0D:
    Patch C 00484.01

    and can not be replaced by this patch.

This patch will not be installed.

```

B.1.8 Patch Installation Blocked by an Existing CSP

Source: dupatch preinstallation check or installation.

Problem: Release patches will not automatically supersede a Customer-Specific patch (CSP).

Causes: A file you are trying to update with a Release patch has been previously updated through the installation of a CSP. The Release patch does not have any knowledge as to whether it contains fixes contained in CSPs.

Action: Determine if the CSP is included in the Release Patch Kit:

- If yes, then you can safely remove the CSP (via dupatch) and reinstall the Release patch .
- If no, contact your service provider to determine how to proceed.

Output:

```

Problem installing:

- DIGITAL_UNIX_V4.0F / Commands, Shells, & Utility Patches:
    Patch 00444.00 - Fixes sort problem when running in Japanese locale

    ./usr/bin/sort:
        is installed by Customer Specific Patch (CSP):

- DIGITAL_UNIX_V4.0F:
    Patch C 00187.00

    and can not be replaced by this patch. To install this patch,
    you must first remove the CSP using dupatch. Before performing
    this action, you should contact your Service
    Representative to determine if this patch kit contains the
    CSP. If it does not, you may need to obtain a new CSP in order
    to install the patch kit and retain the CSP fix.

```

B.1.9 The dupatch Tools Are Outdated

Source: dupatch preinstallation check or installation.

Problem: Patch tool set residing on system are not the most recent version.

Causes: If the dupatch utility delivered with the patch kit determines that the tools residing on the system are not consistent with the patch kit, it will copy over updated versions of utilities used by dupatch.

Action: This is an informational message and no further action is required.

Output:

```

Patch tools need to be installed or updated on your system.
Please invoke the command as the super-user (root) first.

* A new version of patch tools required for patch management
  is now being installed on your system.

```

B.1.10 Some Patches Must Be Made Reversible

Source: dupatch preinstallation check or installation.

Causes: The user tried to install a patch as nonreversible; however, the patch in question must be installed as reversible.

Action: This is an informational message and no further action is required.

Output:

```
* The following patch(es) are required to be reversible and
  will be made reversible automatically:

- DIGITAL_UNIX_V4.0F / Commands, Shells, & Utility Patches:
  Patch C 00187.00 - v 4.0f patch E C187.00
```

B.2 Patch Removal Messages

The following sections describe messages you might see when running the dupatch patch deletion function.

B.2.1 Patch Removal Blocked by Missing Patch Backup Files

Source: dupatch deletion.

Problem: An attempt to remove a specific patch or all patches fails because the backup of the prepatch system files is not available to dupatch.

Causes: The /var/adm/patch/backup area does not contain the prepatch system files.

Action: Ensure that dupatch can access the /var/adm/patch/backup area and that the area is set up as it was when the patches were installed. For example, if you were using /var/adm/patch/backup as a mount point for another file system, make sure that file system is mounted. Once you have solved the /var/adm/patch/backup access or content problem, remove patches through the dupatch Delete Menu.

Output:

```
Checking patch dependency...
  (depending upon the number of patches you select, this may take a while)
-----

- DIGITAL_UNIX_V4.0F / Commands, Shells, & Utility Patches:
  Patch 0019.00 - quota Command Correction

cannot be deleted.

Can not find the backup copy for this patch in /var/adm/patch/backup.
-----

* Following patch(es) failed in dependency check:

- DIGITAL_UNIX_V4.0F / Commands, Shells, & Utility Patches:
  Patch 0019.00 - quota Command Correction
```

B.2.2 Patch Removal Blocked by Dependencies on Other Patches

Source: dupatch deletion.

Problem: A specific patch cannot be removed because of its dependency on other installed patches.

Causes: Generally this occurs when you miss the selection of all dependent patches.

Action: Through the dupatch Delete Menu, reselect the patches including the noted dependent patch and try to remove them. The program will notify you of any other dependent patches you might have missed.

Output:

```
Checking patch dependency...
(dependent upon the number of patches you select, this may take a while)
-----

- DIGITAL_UNIX_V4.0F / Library Patches:
  Patch 0262.00 - libm Corrections

can not be deleted unless the following patches are also selected or
deleted first:

- DIGITAL_UNIX_V4.0F / Library Patches:
  Patch 0676.00 - libm Corrections

-----

* Following patch(es) failed in dependency check:

- DIGITAL_UNIX_V4.0F / Library Patches:
  Patch 0262.00 - libm Corrections
```

B.2.3 No Original Files Restored When Patch Is Removed

Source: dupatch deletion.

Problem: The removal of a specific patch results in no original system files being restored.

Causes: This occurs when a patch delivers files to your system that were not shipped in the initial release of the product. For example, the sample output shows the removal of Tru64 UNIX 4.0F Patch 314.00; the patch delivers files that were not shipped with the initial release of Tru64 UNIX 4.0F.

Action: This is an informational message and no further action is required.

Output:

```
=== Deleting "DIGITAL UNIX V4.0F":

Deleting "Patch: AdvFS Command Correction " (OSFPAT00031400425) .
-----

Patch OSFPAT00031400425 delivered all new files to your system
so there are no original files to be restored.
No user action is necessary.

-----
```

B.3 TruCluster Specific dupatch Messages

The following sections show the output of informational messages you might see when running dupatch on a TruCluster system:

B.3.1 System Not Adequately Prepared

Output:

```
This system is part of a V5.0 cluster which has
not been prepared to do a rolling patch installation. Refer to the Patch
Installation Guide as to the proper procedure to start a
rolling patch.
```

B.3.2 Rolling Upgrade in Progress (Installation)

Output:

This system is part of a V5.0 cluster which is currently in the process of being installed via the rolling upgrade/rolling patch procedure. New patches cannot be installed on the system until the rolling installation procedure has completed on all cluster members.

B.3.3 Rolling Upgrade in Progress (Baselining)

Output:

This Cluster is in the process of a roll. Baselining is not permitted until the cluster is out of the roll.

B.3.4 Version 5.0 Wave 4 Cluster is Unsupported

Output:

This system is a Version 5.0 - Wave 4 Cluster. Dupatch cannot patch this type of cluster. This is an unsupported operation and dupatch will now exit.

B.3.5 Patch Removal Fails Because Needed File Is Unavailable

Source: dupatch deletion.

Problem: An attempt to remove patches fails because the file `/var/adm/patch/versionswitch.txt` is not available to dupatch.

Cause: At least one of the patches selected for deletion in dupatch has a version switch associated with it (defined by having the attribute `PATCH_REQUIRES_VERSION_SWITCH` set to "Y" in its `patch.ctrl` file). The `versionswitch.txt` file is necessary to determine whether the version switch has been thrown.

Action: The dupatch utility returns to the main menu. In order to proceed with the delete operation, you need to determine if the version switch was updated. If it has been thrown, you must run the undo script included with the patch to enable patch deletion (see Section 4.4). If the switch has not been thrown, you can enable the deletion of this patch by reconstructing the `versionswitch.txt` file. You can also reselect patches for deletion, omitting the patch containing the version switch.

Contact your Customer Service Representative for assistance.

Output:

```
/var/adm/patch/versionswitch.txt file not found!  
Cannot delete patches selected since patch_ID requires a version switch.
```

```
Please reselect patches or resolve missing /var/adm/patch/versionswitch.txt  
Please contact your Customer Service Representative for assistance.
```

B.3.6 Patch Removal Fails Because of a Version Switch

Source: dupatch deletion.

Problem: The deletion of a patch containing a version switch has been blocked because the switch has been thrown.

Action: The dupatch utility returns to the main menu. In order to proceed with the delete operation, you need to determine if the version switch was indeed updated. You can also reselect patches for deletion, omitting the patch containing the version switch.

Output:

```
Version switch thrown for patch patch_ID
You cannot delete patch patch_ID
Please refer to the Patch Kit Release Notes for
instructions on allowing the patch deletion to proceed.
```

B.3.7 dupatch Cannot Create Needed File

Source: Patch installation

Problem: The dupatch utility cannot create the file `/var/adm/patch/versionswitch.txt` because it cannot obtain the version switch state from `/etc/sysconfigtab`.

Cause: At least one of the patches selected for installation contains a version switch. dupatch records the current version switch state in the file `/var/adm/patch/versionswitch.txt`. In order to facilitate the installation of this patch, this file must be created. While attempting to create this file, dupatch could not read the `/etc/sysconfigtab` file

Action: Verify that the file `/etc/sysconfigtab` contains the entry `new_vers_low`.

Output:

```
Cannot obtain version switch info from system files!
Cannot create versionswitch.txt file
Please contact your Customer Service Representative for assistance.
```

B.3.8 Insufficient Free Space (File System Full)

Source: `clu_upgrade` setup stage of the rolling upgrade procedure.

Problem: The rolling upgrade cannot proceed because required space allocations are not met.

Causes: The root (`/`), `/usr`, `/var`, and/or `/i18n` file systems do not have the required amount of free space.

Action: Run the `clu_upgrade -undo setup` command, free up enough space in the affected file systems to meet the requirements listed in Section 4.8.1, and rerun the `clu_upgrade -undo setup` command.

Output:

```
*** Error ***
The tar commands used to create tagged files in the '/' file system have
reported the following errors and warnings:
NOTE: CFS: File system full: /

tar: sbin/lsm.d/raid5/volsd : No space left on device
tar: sbin/lsm.d/raid5/volume : No space left on device
```


Patch Installation, Removal, and Baselining Examples

This appendix provides samples of using `dupatch` to do the following:

- Perform a typical patch kit installation (Section C.1).
- Removing a patch kit. Although this example shows the procedure on a cluster, it differs little from what you would see on a single-system (Section C.2).
- Perform a baseline analysis (Section C.3).

C.1 Patch Installation

The following example shows a typical installation of an inclusive patch kit. The procedure is similar for installing the old style patch kits, Customer-Specific Patch Kits (CSP), and Early Release Patch Kits (ERP).

In this example, some of the information you would see during the installation has been replaced by a vertical ellipsis to save space:

Example C-1: Installing a Patch Kit

```
# cd /patches/pk4/patch_kit
# ./dupatch
Enter path to the top of the patch distribution,
or enter "q" to quit : .

    * Previous session logs saved in session.log.[1-25]

This is a new-style patch kit, which differs from earlier Tru64 UNIX
patch kits in several ways:

- You can no longer install or remove individual patches; instead,
  you can only install or remove all of the patches in this kit.

- The time to install this patch kit is substantially faster.

- The list of patches displayed by the dupatch utility has
  a different look.

See the "Patch Summary and Release Notes" and the "Patch Kit
Installation Instructions" for more detailed information.

Tru64 UNIX Patch Utility (Rev. 46-00)
=====
- This dupatch session is logged in /var/adm/patch/log/session.log

Main Menu:
-----

1) Patch Kit Installation
2) Patch Kit Deletion
3) Patch Kit Documentation

4) Patch Tracking
5) Patch Baseline Analysis/Adjustment

h) Help on Command Line Interface

q) Quit

Enter your choice: 1

Tru64 UNIX Patch Utility (Rev. 46-00)
=====
- This dupatch session is logged in /var/adm/patch/log/session.log

Patch Kit Installation Menu:
-----

1) Pre-Installation Check ONLY
2) Check & Install the Patch Kit in Single-User Mode

b) Back to Main Menu
```

Example C-1: Installing a Patch Kit (cont.)

```
q) Quit
Enter your choice: 2

Checking patch kit for transmission errors during download...

Finished Checking patch kit checksums

Gathering patch information...
  (depending upon the size of the patch kit, this may take awhile)

      *** Start of Special Instructions ***

SPECIAL INSTRUCTIONS for Patch 25010.00
Prior to setting the executable_data tunable to a non-zero value, you
must run the following script:
/usr/sbin/javaexecutedata

SPECIAL INSTRUCTIONS for Patch 25102.00
After this patch has been installed the following command must be executed:

/usr/sbin/cdsa/mod_install -f -i -s /usr/lib/cdsa/libt64csp.so -d /usr/lib/cdsa/

      *** End of Special Instructions ***

Press RETURN to proceed...

-----

To Make Patches Reversible - PLEASE READ THE FOLLOWING INFORMATION:

- You have the option to make the patches reversible so you can
  revert the system to its state prior to the installation of a patch.

- Reversibility is achieved by compressing and saving a copy of the
  files being replaced by the patches. These files would be restored
  to the system if you choose to delete a patch.

- If you choose to make patches NON-reversible, then the system cannot
  be restored to the state prior to the installation of a patch; you
  will not be able to delete the patches later.

- This patch kit may force a small set of patches to be reversible to
  ensure your upgrades to future versions of Tru64 UNIX are successful.
  The Patch Utility will make those patches reversible automatically.

Refer to the Release Notes / Installation Instructions provided with
this patch kit.

Do you want the patches to be reversible? [y]: Return

By default, the backup copies of the installed patches will be saved in
"/var/adm/patch/backup".

If you have limited space in /var, you may want to make the backup
directory the mount point for a separate disk partition, an NFS mounted
directory, or a symbolic link to another file system.

You must ensure the backup directory is configured the same way during
any patch removal operations.

Your current setup of "/var/adm/patch/backup" is:

* A plain directory (not a mount point or a symbolic link)

Do you want to proceed with the installation with this setup? [y]: Return

Your name: craig

Enter any notes about this operation that you would like stored for
future reference (To end your input, enter a "."):

: install pk4 patch kit
: .

Checking patch prerequisites and patch file applicability...
  (depending upon the number of patches you select, this may take awhile)

      *** Intalling 78 patches ***

***** CAUTION *****

Interruption of this phase of the operation will corrupt your
operating system software and compromise the patch database
integrity.

DO NOT Ctrl/C, power off your system, or in any other way
interrupt the patch operation. The patch operation is complete
when you are returned to the Patch Utility menus.
```

Example C-1: Installing a Patch Kit (cont.)

```
*****
=== Installing "Tru64 UNIX V5.1B" Patches:

Checking file system space required to install specified subsets:

File system space checked OK.

64 subsets will be installed.

Loading subset 1 of 64 ...

Patch: SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)
  Copying from /var/patch/patch_kit/Tru64_UNIX_V5.1B/kit (disk)
  Verifying

Loading subset 2 of 64 ...

Patch: SP04 OSFHWBASE540
  Copying from /var/patch/patch_kit/Tru64_UNIX_V5.1B/kit (disk)
  Verifying

Loading subset 3 of 64 ...

Patch: SP04 OSFSSOW2K540
  Copying from /var/patch/patch_kit/Tru64_UNIX_V5.1B/kit (disk)
  Verifying
:
:

Loading subset 61 of 64 ...

Patch: SP04 OSFATMBIN540
  Copying from /var/patch/patch_kit/Tru64_UNIX_V5.1B/kit (disk)
  Verifying

Loading subset 62 of 64 ...

Patch: SP04 OSFADVFSBIN540
  Copying from /var/patch/patch_kit/Tru64_UNIX_V5.1B/kit (disk)
  Verifying

Loading subset 63 of 64 ...

Patch: SP04 OSFADVFS540 (SSRT2275)
  Copying from /var/patch/patch_kit/Tru64_UNIX_V5.1B/kit (disk)
  Verifying

Loading subset 64 of 64 ...

Patch: SP04 OSFACCT540
  Copying from /var/patch/patch_kit/Tru64_UNIX_V5.1B/kit (disk)
  Verifying

64 of 64 subsets installed successfully.

*** Merging new file ./etc/.new..magic into
    existing ./etc/.proto..magic
    Adding HP-UX file formats
    Merge completed successfully.

*** Merging new file ./etc/.new..nsswitch.conf into
    existing ./etc/.proto..nsswitch.conf
    Merge completed successfully.

*** Merging new file ./etc/.new..rc.config into
    existing ./etc/.proto..rc.config
    Moving variables from rc.config to rc.config.common
    Moving variables from rc.config to rc.config.common done
    Merge completed successfully.

*** Merging new file ./etc/.new..svc.conf into
    existing ./etc/.proto..svc.conf
    Merge completed successfully.

*** Merging new file ./etc/.new..sysconfigtab into
    existing ./etc/.proto..sysconfigtab

    Merging /etc/./proto..sysconfigtab
    A pre-update copy can be found in
      /etc/sysconfigtab.PreUPD
    Merge completed successfully.

*** Merging new file ./sbin/.new..bcheckrc into
    existing ./sbin/.proto..bcheckrc
    Adding check for Run Level
      Already added
    Fixing check for Run Level
      Already fixed
    Modifying LSM Checks
      Already modified
```

Example C-1: Installing a Patch Kit (cont.)

```
Adding call to mountroot
    Already present
Adding error handling after mountroot
    Already present
Modifying mount of dataless file systems
    Already modified
Changing fsck error handling
    Already done
Removing invocation of scsimgr
    Already removed
Replacing/Removing old-style cluster initializations
* Step 1 - Remove old cluster definitions
    Already removed
* Step 2 - Remove new cluster definitions
    Already removed
* Step 3 - Add inclusion of rc.config
    Already included
* Step 4 - Remove old style initialization
    Already removed
* Step 5 - Remove new style initialization
    Not present
* Step 6 - Remove obsolete master initialization
    Already removed
* Step 7 - Add the GoToSingle function
    Already present
Adding Sanity Check
    Already present
Adding clean-up of /var/run
    Already present
Adding init q
    Already present
Adding dn_boot Check
    Already present
Changing device naming error message
    Already present
Merge completed successfully.

*** Merging new file ./sbin/init.d/.new..rmtmpfiles into
    existing ./sbin/init.d/.proto..rmtmpfiles
Adding empty temp. directory cleanup.
Merge completed successfully.

*** Merging new file ./usr/share/lib/.new..termcap into
    existing ./usr/share/lib/.proto..termcap
./mrg..termcap : dec-vt??? entries already available
Merge completed successfully.

*** Merging new file ./usr/skel/.new...login into
    existing ./usr/skel/.proto...login
Merge completed successfully.

*** Merging new file ./usr/skel/.new...profile into
    existing ./usr/skel/.proto...profile
Merge completed successfully.

*** Merging new file ./usr/var/cluster/members/member0/spool/cron/crontabs/.new..root into
    existing ./usr/var/cluster/members/member0/spool/cron/crontabs/.proto..root
cron may not be running - call your system administrator
Merge completed successfully.

*** Merging new file ./etc/.new..magic into
    existing ./etc/magic
Adding HP-UX file formats
Merge completed successfully.

*** Merging new file ./etc/.new..rc.config into
    existing ./etc/./cluster/members/member0/etc/rc.config
Moving variables from rc.config to rc.config.common
Moving variables from rc.config to rc.config.common done
Merge completed successfully.

*** Merging new file ./etc/.new..svc.conf into
    existing ./etc/svc.conf
Merge completed successfully.

*** Merging new file ./etc/.new..sysconfigtab into
    existing ./etc/sysconfigtab

Merging /etc/sysconfigtab
Merge completed successfully.

*** Merging new file ./sbin/.new..bcheckrc into
    existing ./sbin/bcheckrc
Adding check for Run Level
    Already added
Fixing check for Run Level
    Already fixed
Modifying LSM Checks
    Already modified
Adding call to mountroot
    Already present
```

Example C-1: Installing a Patch Kit (cont.)

```
Adding error handling after mountroot
    Already present
Modifying mount of dataless file systems
    Already modified
Changing fsck error handling
    Already done
Removing invocation of scsimgr
    Already removed
Replacing/Removing old-style cluster initializations
* Step 1 - Remove old cluster definitions
    Already removed
* Step 2 - Remove new cluster definitions
    Already removed
* Step 3 - Add inclusion of rc.config
    Already included
* Step 4 - Remove old style initialization
    Already removed
* Step 5 - Remove new style initialization
    Not present
* Step 6 - Remove obsolete master initialization
    Already removed
* Step 7 - Add the GoToSingle function
    Already present
Adding Sanity Check
    Already present
Adding clean-up of /var/run
    Already present
Adding init q
    Already present
Adding dn_boot Check
    Already present
Changing device naming error message
    Already present
Merge completed successfully.

*** Merging new file ./sbin/init.d/.new..rmtmpfiles into
    existing ./sbin/init.d/rmtmpfiles
Adding empty temp. directory cleanup.
Merge completed successfully.

*** Merging new file ./usr/share/lib/.new..termcap into
    existing ./usr/share/lib/termcap
./mrg..termcap : dec-vt??? entries already available
Merge completed successfully.

*** Merging new file ./usr/skel/.new..login into
    existing ./usr/skel/.login
Merge completed successfully.

*** Merging new file ./usr/skel/.new..profile into
    existing ./usr/skel/.profile
Merge completed successfully.

*** Merging new file ./usr/var/cluster/members/member0/spool/cron/crontabs/.new..root into
    existing ./usr/var/cluster/members/member0/spool/cron/crontabs/root
cron may not be running - call your system administrator
Merge completed successfully.

Configuring "Patch: SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)" (OSFPAT02500900540)

*** Merging new file ./etc/.new..ddr.dbase into
    existing ./etc/.proto..ddr.dbase
Updating HSG entry for TagQueueDepth
Updating HSG redirect entry for TagQueueDepth
Updating SCSI density table entry 0x49
Adding SDLT320 entry
Updating SCSI density table entries 0x40 and 0x42
Adding Ultrium entry
Adding Ultrium mode select parameters
Removing raid attribute from logical volume entries
Update MSA transfer size flag
Updating SCSI density table entries 0x26 and 0x47
Adding DAT72 entry
Update MSA max transfer size
Adding HP XP entry
Updating types on AIT tape drives
Updating HP loader entries
Adding the HP C5683A and C5713A entry
Clean up old HS entries
Adding SDLT600 entry
Adding DLT VS series entry
Update SuperDLT1 MaxTransferSize
Update SDLT320 MaxTransferSize
Updating SCSI density table entries 0x4a thru 0x50
Adding Ultrium density parameters
Adding DAT72X6 Tape entry
Adding DAT72X6 changer entry
Disable HSZ failures on ASCQ_LUN_NRDY_MAN
Updating XP Console VPDinfo
Compiling DDR database with /sbin/ddr_config
Merge completed successfully.
```

Example C-1: Installing a Patch Kit (cont.)

```
*** Merging new file ./etc/.new..ddr.dbase into
    existing ./etc/ddr.dbase
    Updating HSG entry for TagQueueDepth
    Updating HSG redirect entry for TagQueueDepth
    Updating SCSI density table entry 0x49
    Adding SDLT320 entry
    Updating SCSI density table entries 0x40 and 0x42
    Adding Ultrium entry
    Adding Ultrium mode select parameters
    Removing raid attribute from logical volume entries
    Update MSA transfer size flag
    Updating SCSI density table entries 0x26 and 0x47
    Adding DAT72 entry
    Update MSA max transfer size
    Adding HP XP entry
    Updating types on AIT tape drives
    Updating HP loader entries
    Adding the HP C5683A and C5713A entry
    Clean up old HS entries
    Adding SDLT600 entry
    Adding DLT VS series entry
    Update SuperDLT1 MaxTransferSize
    Update SDLT320 MaxTransferSize
    Updating SCSI density table entries 0x4a thru 0x50
    Adding Ultrium density parameters
    Adding DAT72X6 Tape entry
    Adding DAT72X6 changer entry
    Disable HSZ failures on ASCQ_LUN_NRDY_MAN
    Updating XP Console VPDinfo
    Compiling DDR database with /sbin/ddr_config
    Merge completed successfully.

Configuring "Patch: SP04 OSFHWBASE540" (OSFPAT02503400540)

Configuring "Patch: SP04 OSFSSOW2K540" (OSFPAT02511500540)

Configuring "Patch: SP04 OSFSSOSSL540 (SSRT3622)" (OSFPAT02511400540)

Configuring "Patch: SP04 OSFSSHBASE540 (SSRT3588 SSRT2275)" (OSFPAT02511300540)

Configuring "Patch: SP04 OSFOPENGL540" (OSFPAT02511000540)

Configuring "Patch: SP04 OSFLDPAUTH540" (OSFPAT02510700540)

Configuring "Patch: SP04 OSFIPSECBASE540 (SSRT3629A)" (OSFPAT02510600540)

Configuring "Patch: SP04 OSFCDSABASE540 (SSRT3518)" (OSFPAT02510200540)

Configuring "Patch: SP04 OSFXSYSMAN540" (OSFPAT02510000540)

Configuring "Patch: SP04 OSFXMIT540" (OSFPAT02509500540)

Configuring "Patch: SP04 OSFXLIBA540" (OSFPAT02509400540)

Configuring "Patch: SP04 OSFXDEMOS540" (OSFPAT02508900540)

Configuring "Patch: SP04 OSFXADMIN540" (OSFPAT02508600540)

*** Merging new file ./usr/lib/X11/app-defaults/.new..DXterm into
    existing ./usr/lib/X11/app-defaults/.proto..DXterm
    Merge completed successfully.

*** Merging new file ./usr/lib/X11/app-defaults/.new..DXterm into
    existing ./usr/lib/X11/app-defaults/DXterm
    Merge completed successfully.

Configuring "Patch: SP04 OSFX11540" (OSFPAT02508500540)

Configuring "Patch: SP04 OSFUUCP540 (SSRT2301 SSRT2275)" (OSFPAT02508400540)

Configuring "Patch: SP04 OSFTCLBASE540" (OSFPAT02508000540)

*** Merging new file ./etc/.new..doprc into
    existing ./etc/.proto..doprc
    Modifying ./proto..doprc
    Merge completed successfully.

*** Merging new file ./etc/.new..doprc into
    existing ./etc/doprc
    Modifying doprc
    Merge completed successfully.

Configuring "Patch: SP04 OSFSYSMAN540 (SSRT1-42U SSRT1-41U SSRT1-40U)" (OSFPAT02507900540)

Configuring "Patch: SP04 OSFSERVICETOOLS540" (OSFPAT02507700540)

Configuring "Patch: SP04 OSFSER540" (OSFPAT02507500540)

Configuring "Patch: SP04 OSFSDE540" (OSFPAT02507300540)
```

Example C-1: Installing a Patch Kit (cont.)

```
Configuring "Patch: SP04 OSFSCCS540 (SSRT2275)" (OSFPAT02507200540)

Configuring "Patch: SP04 OSFRIS540" (OSFPAT02507100540)

Configuring "Patch: SP04 OSFRCS540" (OSFPAT02507000540)

Configuring "Patch: SP04 OSFPRINT540" (OSFPAT02506900540)

Configuring "Patch: SP04 OSFPGMR540 (SSRT2275)" (OSFPAT02506800540)

Configuring "Patch: SP04 OSFOBSOLETE540" (OSFPAT02506400540)

Configuring "Patch: SP04 OSFNFS540" (OSFPAT02506200540)

Configuring "Patch: SP04 OSFNETCONF540 (SSRT3674)" (OSFPAT02506000540)

Configuring "Patch: SP04 OSFMANOS540 (SSRT2275)" (OSFPAT02505500540)

Configuring "Patch: SP04 OSFMANOP540" (OSFPAT02505400540)

Configuring "Patch: SP04 OSFLSMX11540" (OSFPAT02505300540)

Configuring "Patch: SP04 OSFLSMBIN540" (OSFPAT02505200540)

Configuring "Patch: SP04 OSFLSMBASE540 (SSRT2275)" (OSFPAT02505100540)

Configuring "Patch: SP04 OSFLIBA540 (SSRT2275)" (OSFPAT02505000540)

Configuring "Patch: SP04 OSFLEARN540" (OSFPAT02504900540)

Configuring "Patch: SP04 OSFLDBDOC540" (OSFPAT02504800540)

Configuring "Patch: SP04 OSFLDBBASE540" (OSFPAT02504700540)

Configuring "Patch: SP04 OSFLAT540" (OSFPAT02504600540)

    *** Merging new file ./usr/var/kdbx/.new..system.kdbxrc into
        existing ./usr/var/kdbx/.proto..system.kdbxrc
        adding ipv6
        Merge completed successfully.

    *** Merging new file ./usr/var/kdbx/.new..system.kdbxrc into
        existing ./usr/var/kdbx/./cluster/members/member0/kdbx/system.kdbxrc
        adding ipv6
        Merge completed successfully.

Configuring "Patch: SP04 OSFKTOOLS540" (OSFPAT02504500540)

    *** Merging new file ./usr/var/yp/.new..Makefile into
        existing ./usr/var/yp/.proto..Makefile
        Adding additional Enhanced Security database rules.
        Merge completed successfully.

    *** Merging new file ./usr/var/yp/.new..Makefile into
        existing ./usr/var/yp/Makefile
        Adding additional Enhanced Security database rules.
        Merge completed successfully.

Configuring "Patch: SP04 OSFINET540 (SSRT3653 SSRT2408 SSRT2368)" (OSFPAT02503900540)

Configuring "Patch: SP04 OSFINCLUDE540" (OSFPAT02503800540)

Configuring "Patch: SP04 OSFHWBINCOM540" (OSFPAT02503600540)

Configuring "Patch: SP04 OSFHWBIN540" (OSFPAT02503500540)

Configuring "Patch: SP04 OSFEXER540" (OSFPAT02503100540)

Configuring "Patch: SP04 OSFEXAMPLES540" (OSFPAT02503000540)

Configuring "Patch: SP04 OSFENVMON540" (OSFPAT02502800540)

Configuring "Patch: SP04 OSFDOSTOOLS540" (OSFPAT02502600540)

Configuring "Patch: SP04 OSFDCMTEXT540" (OSFPAT02502300540)

Configuring "Patch: SP04 OSFDCMT540" (OSFPAT02502200540)

Configuring "Patch: SP04 OSFCMPLRS540 (SSRT2439 SSRT2384 SSRT2341 ...)" (OSFPAT02502100540)

    *** Merging new file ./etc/.new..inetd.conf into
        existing ./etc/.proto..inetd.conf
        Disabling rpc.rquotad entry in /etc/inetd.conf
        Merge completed successfully.

    *** Merging new file ./etc/.new..pmgrd_iorate.config into
        existing ./etc/.proto..pmgrd_iorate.config
        Making no changes to the existing ./etc/.proto..pmgrd_iorate.config
        Merge completed successfully.

    *** Merging new file ./etc/.new..protocols into
```

Example C-1: Installing a Patch Kit (cont.)

```
        existing ./etc/.proto..protocols
        adding IPV6 protocols
        adding Mobility Header protocol
        Merge completed successfully.

*** Merging new file ./etc/.new..inetd.conf into
        existing ./etc/inetd.conf
        Disabling rpc.rquotad entry in /etc/inetd.conf
        Merge completed successfully.

*** Merging new file ./etc/.new..pmgrd_iorate.config into
        existing ./etc/./cluster/members/member0/etc/pmgrd_iorate.config
        Making no changes to the existing ./cluster/members/member0/etc/pmgrd_iorate.config
        Merge completed successfully.

*** Merging new file ./etc/.new..protocols into
        existing ./etc/protocols
        adding IPV6 protocols
        adding Mobility Header protocol
        Merge completed successfully.

Configuring "Patch: SP04 OSFCLINET540 (SSRT3653 SSRT2384 SSRT2275 ...)" (OSFPAT02502000540)

Configuring "Patch: SP04 OSFCDEMIN540 (SSRT3589)" (OSFPAT02501900540)

Configuring "Patch: SP04 OSFCDEMAIL540" (OSFPAT02501600540)

Configuring "Patch: SP04 OSFCDEDT540 (SSRT2405)" (OSFPAT02501500540)

Configuring "Patch: SP04 OSFCDEDEV540" (OSFPAT02501400540)

Configuring "Patch: SP04 OSFCDEAPPS540" (OSFPAT02501300540)

Configuring "Patch: SP04 OSFC2SEC540" (OSFPAT02501200540)

Configuring "Patch: SP04 OSFBINCOM540 (SSRT2275)" (OSFPAT02501100540)

Configuring "Patch: SP04 OSFBIN540 (SSRT2323 SSRT2275 SSRT2266)" (OSFPAT02501000540)

Configuring "Patch: SP04 OSFATMBIN540" (OSFPAT02500700540)

Configuring "Patch: SP04 OSFADVFSBIN540" (OSFPAT02500300540)

Configuring "Patch: SP04 OSFADVFS540 (SSRT2275)" (OSFPAT02500200540)

Configuring "Patch: SP04 OSFACCT540" (OSFPAT02500100540)

=== Installing "I18N V5.1B" Patches:

Checking file system space required to install specified subsets:

File system space checked OK.

14 subsets will be installed.

Loading subset 1 of 14 ...

Patch: SP04 IOSWWSYSMAN540
    Copying from /var/patch/patch_kit/I18N_UNIX_V5.1B/kit (disk)
    Verifying

Loading subset 2 of 14 ...

Patch: SP04 IOSZHX11540
    Copying from /var/patch/patch_kit/I18N_UNIX_V5.1B/kit (disk)
    Verifying

Loading subset 3 of 14 ...

Patch: SP04 IOSJXPADMIN540
    Copying from /var/patch/patch_kit/I18N_UNIX_V5.1B/kit (disk)
    Verifying
.
.
.

Loading subset 12 of 14 ...

Patch: SP04 IOSZHCNBASE540
    Copying from /var/patch/patch_kit/I18N_UNIX_V5.1B/kit (disk)
    Verifying

Loading subset 13 of 14 ...

Patch: SP04 IOSZHSSYSMAN540
    Copying from /var/patch/patch_kit/I18N_UNIX_V5.1B/kit (disk)
    Verifying

Loading subset 14 of 14 ...

Patch: SP04 IOSZHSXADMIN540
```

Example C-1: Installing a Patch Kit (cont.)

```
Copying from /var/patch/patch_kit/I18N_UNIX_V5.1B/kit (disk)
Verifying

14 of 14 subsets installed successfully.

Configuring "Patch: SP04 IOSWWSYSMAN540" (IOSPAT02524800540)

Configuring "Patch: SP04 IOSZHX11540" (IOSPAT02529400540)

Configuring "Patch: SP04 IOSJXPADMIN540" (IOSPAT02513100540)

Configuring "Patch: SP04 IOSJFXSYSMAN540" (IOSPAT02513400540)

Configuring "Patch: SP04 IOSJPBASE540" (IOSPAT02510200540)

Configuring "Patch: SP04 IOSWWBASE540" (IOSPAT02521400540)

Configuring "Patch: SP04 IOSWWBIN540" (IOSPAT02521500540)

Configuring "Patch: SP04 IOSJPBIN540" (IOSPAT02510300540)

Configuring "Patch: SP04 IOSJPCDEDT540" (IOSPAT02510600540)

Configuring "Patch: SP04 IOSWWX11540" (IOSPAT02525100540)

Configuring "Patch: SP04 IOSJPSYSMAN540" (IOSPAT02512500540)

Configuring "Patch: SP04 IOSZHCBASE540" (IOSPAT02525600540)

Configuring "Patch: SP04 IOSZHSSYSMAN540" (IOSPAT02527100540)

Configuring "Patch: SP04 IOSZHSXADMIN540" (IOSPAT02527600540)
/var/patch/patch_kit/I18N_UNIX_V5.1B/doc: No such file or directory

Beginning kernel build...

Do you have a pre-existing configuration file?: y

Enter the name of the pre-existing configuration file or
press RETURN to use LANDO: Return

*** KERNEL CONFIGURATION AND BUILD PROCEDURE ***

Saving /sys/conf/LANDO as /sys/conf/LANDO.bck

Do you want to edit the configuration file? (y/n) [n]: Return

*** PERFORMING KERNEL BUILD ***
Working...Wed Apr 21 13:56:22 EDT 2004

The new kernel is /sys/LANDO/vmunix

=====

- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25010.00 - SP04 OSFBIN540 (SSRT2323 SSRT2275 SSRT2266)

SPECIAL INSTRUCTIONS for Patch 25010.00
Prior to setting the executable_data tunable to a non-zero value, you
must run the following script:
/usr/sbin/javaexecutedata

=====

- Tru64_UNIX_V5.1B / Security Related Patches:
  Patch 25102.00 - SP04 OSFCD SABASE540 (SSRT3518)

SPECIAL INSTRUCTIONS for Patch 25102.00
After this patch has been installed the following command must be executed:

/usr/sbin/cdsa/mod_install -f -i -s /usr/lib/cdsa/libt64csp.so -d /usr/lib/cdsa/

A reboot is necessary to complete the patch installation. Do
you want to reboot now? [y/n] [y]: Return

Existing kernel copied to /vmunix.PrePatch.

New Kernel (/sys/LANDO/vmunix) copied to /vmunix.

*** successfully installed 78 patches; failed to install 0 patches ***

* A system reboot of the patched system is required for the successfully installed patches.
```

C.2 Patch Removal

The following example shows the removal of all patches from a cluster. Except for a few cluster-specific references, this process is the same as you would see on a single-system. The procedure is similar for installing the old style patch kits, Customer-Specific Patch Kits (CSP), and Early Release Patch Kits (ERP).

The system in this example contains patches from both the old and the new style of patch kits. Because all patches from the new patch kits must be deleted together, the administrator of a system such as this can do one of the following:

- Individually select all patches from the inclusive patch kit and leave alone any CSPs, ERPs or patches from the old style kits. This is what the example shows.
- Select the “all” menu item to delete all installed patches. Note that using “all” will also result in the removal of any CSPs and ERPs.

Example C-2: Removing Patches Installed with a New Style Patch kit

```
# cd /patches/pk4/patch_kit
# ./dupatch

Enter path to the top of the patch distribution,
or enter "q" to quit : .

    * Previous session logs saved in session.log.[1-25]

This is a new style patch kit, which differs from earlier Tru64 UNIX
patch kits in several ways:

- You can no longer install or remove individual patches; instead,
  you can only install or remove all of the patches in this kit.

- The time to install this patch kit is substantially faster.

- The list of patches displayed by the dupatch utility has
  a different look.

See the "Patch Summary and Release Notes" and the "Patch Kit  Installation
Instructions" for more detailed information.

Tru64 UNIX Patch Utility (Rev. 46-00)
=====
- This dupatch session is logged in /var/adm/patch/log/session.log

Main Menu:
-----

1) Patch Kit Installation
2) Patch Kit Deletion
3) Patch Kit Documentation

4) Patch Tracking
5) Patch Baseline Analysis/Adjustment

h) Help on Command Line Interface

q) Quit

Enter your choice: 2

Checking Cluster State...done

    *** Start of Special Instructions ***

SPECIAL INSTRUCTIONS for Patch 25102.00
After this patch has been installed the following command must be executed:

/usr/sbin/cdsa/mod_install -f -i -s /usr/lib/cdsa/libt64csp.so -d /usr/lib/cdsa/

-----
Press RETURN to continue viewing Special Instructions....

    *** End of Special Instructions ***

There may be more products than can be presented on a single
screen. If this is the case, you can choose products screen by screen
or all at once on the last screen. All of the choices you make will
be collected for your confirmation before any products are deleted.

1) Patches for Tru64 UNIX V5.1B
2) Patches for TruCluster Server V5.1B

Or you may choose one of the following options:

3) ALL of the above
4) CANCEL selections and redisplay menus
```

Example C-2: Removing Patches Installed with a New Style Patch kit (cont.)

```
5) EXIT without deleting any products

Enter your choices or press RETURN to redisplay menus.

Choices (for example, 1 2 4-6): 3

You are deleting patches (to be selected) from the following products:

    Patches for Tru64 UNIX V5.1B
    Patches for TruCluster Server V5.1B

Is this correct? (y/n): y

Your name: marc

Enter any notes about this operation that you would like stored for
future reference (To end your input, enter a "."):

: .
    There may be more patches than can be presented on a single
    screen. If this is the case, you can choose patches screen by screen
    or all at once on the last screen. All of the choices you make will
    be collected for your confirmation before any patches are deleted.

- Tru64_UNIX_V5.1B / Cluster Monitor Patches:
    1) Patch 01363.00 - Adds CDSL to the binlog archive directory

- Tru64_UNIX_V5.1B / Commands, Shells, & Utilities Patches:
    2) Patch 00016.00 - Update for dsfmgmr utility
    3) Patch 00060.00 - Update to siacfg utility
    4) Patch 00137.00 - Fix for startslip program
    5) Patch 00347.00 - Fix allows fuser to display the reference flag
    6) Patch 00555.00 - Scripts in /sbin/init.d are now world readable
    7) Patch 00557.00 - Scripts in /sbin/init.d are now world readable
    8) Patch 00560.00 - Update to nis startup script
    9) Patch 00562.00 - Scripts in /sbin/init.d are now world readable
    10) Patch 00578.00 - Fix for grep command hang

--- MORE TO FOLLOW ---
Enter your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6):

    11) Patch 00637.00 - Fix for .mrg..termcap file
    12) Patch 00648.00 - Fix for fwtmcp command
    13) Patch 00662.00 - mtools now prints appropriate error messages
    14) Patch 00674.00 - Fix for ln command
    15) Patch 00687.00 - Removes compiler warnings
    16) Patch 00692.00 - Fix for dump command
    17) Patch 00694.00 - Corrects exit status of sed when disk is full
    18) Patch 00705.00 - Eliminates compiler warnings in mkdir
    19) Patch 00722.00 - Fixes a typo in mkcdsl
    20) Patch 00727.00 - Fix for which command
    21) Patch 00737.00 - Fix for tip command
    22) Patch 00739.00 - Fix enables tip to log into member specific log file
    23) Patch 00741.00 - Fix for default cron jobs
    24) Patch 00747.00 - Fix for btextextract utility
    25) Patch 00749.00 - make cmd now checks dependencies on archive libraries
    26) Patch 00751.00 - Fix for .mrg...login script
    27) Patch 00797.00 - Fixes cut cmd to handle incomplete lines correctly
    28) Patch 00821.00 - Fixes a problem with scu

--- MORE TO FOLLOW ---
Enter your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6):

    29) Patch 01092.00 - Provides the feedback facility for dd
    30) Patch 01108.00 - Removes the 250 variable limit for /usr/bin/env
    31) Patch 01141.00 - Fix for cdvd command
    32) Patch 01144.00 - Fix for awk command
    33) Patch 01153.00 - Fix for adduser command
    34) Patch 01188.00 - Fix a race condition in rm command
    35) Patch 01190.00 - mkcdsl now properly deals with sticky bits on files
    36) Patch 01197.00 - Removes the race security vulnerability in find
    37) Patch 01199.00 - bttape throws a msg when run by non-privileged user
    38) Patch 01219.00 - Fix for ps command
    39) Patch 01231.00 - Fix cfgmgr from waiting for the already gone remote
    40) Patch 01235.00 - Fixes a buffer overflow problem in /usr/bin/write
    41) Patch 01270.00 - Fixes a problem in evm
    42) Patch 01284.00 - Adds support to check for syntax error in EVM
    43) Patch 01318.00 - Corrects a potential binlogd core dump problem
    44) Patch 01322.00 - Fix for binlogshow: DECEvent handshake protocol error
    45) Patch 01391.00 - tar -p preserves mode for extracted directories
    46) Patch 01398.00 - Fix for vrestore command

--- MORE TO FOLLOW ---
Enter your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6):
```

Example C-2: Removing Patches Installed with a New Style Patch kit (cont.)

```
47) Patch 25022.00 - SP04 OSFDCMT540
48) Patch 25023.00 - SP04 OSFDCMTEXT540
49) Patch 25026.00 - SP04 OSFDOSTOOLS540
50) Patch 25046.00 - SP04 OSFLAT540
51) Patch 25049.00 - SP04 OSFLEARN540
52) Patch 25064.00 - SP04 OSFOBSOLETE540
53) Patch 25068.00 - SP04 OSFPGMR540 (SSRT2275)
54) Patch 25080.00 - SP04 OSFTCLBASE540
55) Patch 25084.00 - SP04 OSFUUCP540 (SSRT2301 SSRT2275)

- Tru64_UNIX_V5.1B / Common Desktop Environment (CDE) Patches:
56) Patch 25013.00 - SP04 OSFCDEAPPS540
57) Patch 25014.00 - SP04 OSFCDEDEV540
58) Patch 25015.00 - SP04 OSFCDEDT540 (SSRT2405)
59) Patch 25016.00 - SP04 OSFCDEMAIL540
60) Patch 25019.00 - SP04 OSFCDEMIN540 (SSRT3589)

--- MORE TO FOLLOW ---
Enter your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60

- Tru64_UNIX_V5.1B / Filesystem Patches:
61) Patch 00185.00 - Prevents addvol from adding invalid disks into domain
62) Patch 00187.00 - Fix for invalid disks being added into domain
63) Patch 00201.00 - Fix for verify utility
64) Patch 00735.00 - Fix for chfile command
65) Patch 00795.00 - Fix for advfsstat command
66) Patch 00803.00 - Fix for migrate utility
67) Patch 00811.00 - Fix for defragment utility
68) Patch 00819.00 - Corrects problem with volmake utility
69) Patch 01055.00 - Null partition checking code improvements
70) Patch 01149.00 - Corrects improper file access
71) Patch 01156.00 - Fix for volassist command
72) Patch 01172.00 - nvbmtpg -v option fixed
73) Patch 01178.00 - corrects an issue of a cluster node hanging on boot
74) Patch 01221.00 - Erroneous DMAPI msgs can be displayed using showfile
75) Patch 01251.00 - Modified volplex to detach mirrored swap plex
76) Patch 01280.00 - rpc.lockd: Reply to originating address

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60

77) Patch 01286.00 - lsmbstartup fix to ignore comments in /etc/fstab
78) Patch 01336.00 - Corrects an error return code for volinfo
79) Patch 01351.00 - send disk group option to usage type utils, volplex
80) Patch 25002.00 - SP04 OSFADVFS540 (SSRT2275)
81) Patch 25003.00 - SP04 OSFADVFSBIN540
82) Patch 25062.00 - SP04 OSFNFS540

- Tru64_UNIX_V5.1B / Hardware Configuration Patches:
83) Patch 00159.00 - Fix hwmgr command to show path state correctly
84) Patch 00248.00 - Fix for hwmgr delete command option
85) Patch 25036.00 - SP04 OSFHWBINCOM540

- Tru64_UNIX_V5.1B / I/O Device Handling Patches:
86) Patch 00223.00 - Add scsi reserve/release support to mt
87) Patch 00240.00 - Fix for hwmgr command
88) Patch 00275.00 - Fix for hwmgr -view transaction -cluster command
89) Patch 00281.00 - Fixes a problem in usb_hid.mod
90) Patch 00298.00 - Fixes consvar -s bootdef_dev failure with KZPCC

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85

91) Patch 00382.00 - Fixes a simple lock panic in the floppy driver
92) Patch 00801.00 - Fixes reset logic for Tru64 IDE/ATAPI driver
93) Patch 00837.00 - Fix re_ioctl() cases DIODCMD and DIODCDB
94) Patch 01062.00 - Null partition checking code improvements
95) Patch 01164.00 - Patch to update mcutil and event manager .h files
96) Patch 01209.00 - Fixes a problem in the KZPCA itpsa driver
97) Patch 01227.00 - KZPEA firmware fails to correctly handle filemarks
98) Patch 01233.00 - Cannot connect to printer on parallel port
99) Patch 01308.00 - Fixes video jitter on certain VX1 graphics cards
100) Patch 25034.00 - SP04 OSFHWBSE540
101) Patch 25035.00 - SP04 OSFHWBIN540

- Tru64_UNIX_V5.1B / I18N Patches:
102) Patch 00339.00 - Updated keyboard map for Russian 3R-LKQ48-BT
103) Patch 01243.00 - Fixes Chinese support prob with input, cut-and-paste
104) Patch 01245.00 - Fixes Chinese support prob with input, cut-and-paste
105) Patch 01312.00 - Prevents garbled characters with dxdw

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101
```

Example C-2: Removing Patches Installed with a New Style Patch kit (cont.)

```
- Tru64_UNIX_V5.1B / Installation Patches:
106) Patch 00476.00 - Corrects hang in log command
107) Patch 00809.00 - Fix for bcheckrc script
108) Patch 25071.00 - SP04 OSFRIS540

- Tru64_UNIX_V5.1B / Kernel Patches:
109) Patch 00205.00 - Fixes a correctable error reporting problem
110) Patch 00664.00 - Fixes erroneous reboot of the operating system
111) Patch 00760.00 - Corrects a problem in the marvel_pfm driver
112) Patch 01090.00 - Add NUMA function prototypes to sys/cpuset.h, numa.h
113) Patch 01133.00 - Latent Support for Field Service of GS1280s
114) Patch 01249.00 - Add new 21364-based error log entry types
115) Patch 01254.00 - Corrects behavior of munlockall in librt
116) Patch 01257.00 - Corrects behavior of munlockall in librt
117) Patch 01302.00 - Corrects improper file access
118) Patch 25007.00 - SP04 OSFATMBIN540
119) Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101 108 118 119

120) Patch 25010.00 - SP04 OSFBIN540 (SSRT2323 SSRT2275 SSRT2266)
121) Patch 25011.00 - SP04 OSFBINCOM540 (SSRT2275)
122) Patch 25045.00 - SP04 OSFKTOOLS540
123) Patch 25051.00 - SP04 OSFLSMBASE540 (SSRT2275)
124) Patch 25052.00 - SP04 OSFLSMBIN540

- Tru64_UNIX_V5.1B / Library Patches:
125) Patch 00225.00 - Interop problem between curses.h and esnmp.h
126) Patch 25050.00 - SP04 OSFLIBA540 (SSRT2275)

- Tru64_UNIX_V5.1B / Mail Patches:
127) Patch 00789.00 - Correct improper file or privilege management
128) Patch 01237.00 - sendmail configuration file update
129) Patch 01338.00 - Corrects local and remote security domain risks

- Tru64_UNIX_V5.1B / Network Patches:
130) Patch 00320.00 - Fixes problem with IPv6 neighbor discovery daemon
131) Patch 00384.00 - Fix for telnetd daemon

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101 108 118-119 120-124 126

132) Patch 00423.00 - Fix potential denial of service
133) Patch 00502.00 - Fixes Solaris rcp commands failures
134) Patch 00547.00 - Fixes problem in XTI caused by blocked mutex lock
135) Patch 00549.00 - Fixes problem in XTI caused by blocked mutex lock
136) Patch 00689.00 - Corrects a problem in os_mibs
137) Patch 00743.00 - Corrects a problem in nifd
138) Patch 00815.00 - Addition of new sysconfigurable attribute
139) Patch 00861.00 - Fixes a problem in .mrg..protocols merge script
140) Patch 01088.00 - Fixes problem in tcpdump
141) Patch 01094.00 - Enhanced KDBX debugging features
142) Patch 01120.00 - Corrects potential hang of IPv6 routing daemon
143) Patch 01195.00 - Adds support to gated for option aliases-nextthop
144) Patch 01207.00 - Suppress in_cksum() debug message sent to console
145) Patch 01261.00 - Fix incorrect diagnostic msg in traceroute cmd
146) Patch 01282.00 - mouted incorrectly creates and accesses tmp files
147) Patch 01296.00 - Prevents a possible replay attack when using IPsec
148) Patch 01328.00 - Adds control for encryption types used by Kerberos
149) Patch 01330.00 - Adds control for encryption types used by Kerberos

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101 108 118-124 126

150) Patch 01334.00 - ftpd core dumps when client sends out of order cmd
151) Patch 01370.00 - Fix inetd fork() errors on NUMA-based AlphaServers
152) Patch 25020.00 - SP04 OSFCLINET540 (SSRT3653 SSRT2384 SSRT2275 ...)
153) Patch 25039.00 - SP04 OSFINET540 (SSRT3653 SSRT2408 SSRT2368)
154) Patch 25060.00 - SP04 OSFNETCONF540 (SSRT3674)

- Tru64_UNIX_V5.1B / Printers Patches:
155) Patch 01128.00 - Printing maintainability enhancements
156) Patch 01247.00 - Fixes a problem adding remote printers
157) Patch 25069.00 - SP04 OSFPRINT540

- Tru64_UNIX_V5.1B / Reference Page Patches:
158) Patch 25054.00 - SP04 OSFMANOP540
159) Patch 25055.00 - SP04 OSFMANOS540 (SSRT2275)

- Tru64_UNIX_V5.1B / Reference Page:
160) Patch 00391.00 - Updates reference pages for VLAN functionality
161) Patch 00414.00 - Revises several ssh reference pages
```

Example C-2: Removing Patches Installed with a New Style Patch kit (cont.)

```
--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6):  47-60 80-82 85 100-101 108 118-124 126 152-154 157-159

162) Patch 00421.00 - Revises envconfig.8 and envmond.8 reference pages
163) Patch 00444.00 - Revises tcpdump.8 ref page for VLAN functionality
164) Patch 00446.00 - Revises the mt.1 reference page
165) Patch 00506.00 - Revised newfs.8 reference page
166) Patch 00696.00 - Revises the sys_attrs_ee(5) reference page
167) Patch 00758.00 - Revision to the vdump.8 reference page
168) Patch 00787.00 - Revision of the fwupgrade(8) reference page
169) Patch 00876.00 - Revises collect(8) and pmgrd(8) reference pages
170) Patch 00878.00 - update evminfo(1) reference page
171) Patch 01135.00 - Revises the kdbx(8) reference page
172) Patch 01272.00 - Revises the binlogd.8 reference page
173) Patch 01274.00 - Revises the codconfig(8) manpage
174) Patch 01292.00 - Revises the sys_attrs_clubase(5) manpage
175) Patch 01300.00 - Revises the sys_attrs_lsm(5) reference page
176) Patch 01306.00 - Revises the EvmEventPost(3) reference page
177) Patch 01342.00 - Revises the xmesh(1) reference page
178) Patch 01344.00 - Revises the fuser(8) reference page
179) Patch 01346.00 - Revises the voliod(8) reference page

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6):  47-60 80-82 85 100-101 108 118-124 126 152-154 157-159

180) Patch 01396.00 - Revises references pages for sections 4, 5, and 8
181) Patch 01400.00 - Revises references pages for sections 1, 5, and 8
182) Patch 01406.00 - Revises the volassist(8) reference page
183) Patch 01410.00 - Revises volrestore(8) and volsave(8) reference pages
184) Patch 01412.00 - Revises the nsdispatch(3) reference page

- Tru64_UNIX_V5.1B / Security Related Patches:
185) Patch 00002.00 - Correct improper file access
186) Patch 00006.00 - Correct improper file access
187) Patch 00008.00 - Correct improper file access
188) Patch 00010.00 - Correct potential buffer overflow
189) Patch 00012.00 - Correct potential buffer overflow
190) Patch 00036.00 - Correct potential buffer overflow
191) Patch 00058.00 - Security (SSRTL-40U, SSRTL-41U, SSRTL-42U)
192) Patch 00062.00 - Correct improper file access
193) Patch 00084.00 - Security (SSRT2208)
194) Patch 00086.00 - Security (SSRTL-40U, SSRTL-41U, SSRTL-42U)
195) Patch 00091.00 - Correct improper file access

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6):  47-60 80-82 85 100-101 108 118-124 126 152-154 157-159

196) Patch 00135.00 - Correct potential buffer overflow
197) Patch 00139.00 - Correct improper file access
198) Patch 00157.00 - Correct improper file access
199) Patch 00167.00 - Security (SSRT2368, SSRT2368)
200) Patch 00171.00 - Correct improper file access
201) Patch 00173.00 - Fix race condition & improper file access
202) Patch 00191.00 - Correct improper file access
203) Patch 00193.00 - Correct improper file access
204) Patch 00197.00 - Read privileges being stripped from passwd file
205) Patch 00199.00 - Correct improper file access
206) Patch 00203.00 - Correct improper file access
207) Patch 00219.00 - Correct improper file access
208) Patch 00229.00 - Correct improper file access
209) Patch 00232.00 - Correct improper file access
210) Patch 00234.00 - Correct improper file access
211) Patch 00238.00 - Correct improper file access
212) Patch 00250.00 - Correct improper file access
213) Patch 00254.00 - Correct improper file access

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6):  47-60 80-82 85 100-101 108 118-124 126 152-154 157-159

214) Patch 00262.00 - Correct improper file access
215) Patch 00264.00 - Correct improper file access
216) Patch 00266.00 - Correct improper file access
217) Patch 00272.00 - Correct improper file access
218) Patch 00283.00 - Correct improper file access
219) Patch 00285.00 - Correct improper file access
220) Patch 00289.00 - Correct improper file access
221) Patch 00296.00 - Correct improper file access
222) Patch 00306.00 - Correct improper file access
223) Patch 00311.00 - Correct improper file access
224) Patch 00317.00 - Security (SSRTL-40U, SSRTL-41U, SSRTL-42U)
225) Patch 00322.00 - Correct improper file access
226) Patch 00324.00 - Correct improper file access
```

Example C-2: Removing Patches Installed with a New Style Patch kit (cont.)

```
227) Patch 00334.00 - Correct improper file access
228) Patch 00345.00 - Correct improper file access
229) Patch 00351.00 - Correct improper file access
230) Patch 00360.00 - Correct improper file access
231) Patch 00362.00 - Correct improper file access

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101 108 118-124 126 152-154 157-159

232) Patch 00364.00 - Correct improper file access
233) Patch 00368.00 - Correct improper file access
234) Patch 00370.00 - Correct improper file access
235) Patch 00378.00 - Security (SSRT1-40U, SSRT1-41U, SSRT1-42U)
236) Patch 00380.00 - Correct improper file access
237) Patch 00387.00 - Correct improper file access
238) Patch 00416.00 - Fix for creacct hang
239) Patch 00433.00 - Fix race condition and improper file access
240) Patch 00454.00 - Correct potential buffer overflow
241) Patch 00458.00 - Correct potential buffer overflow
242) Patch 00525.00 - Security (SSRT2301, SSRT2275)
243) Patch 00527.00 - Security (SSRT2275)
244) Patch 00529.00 - Security (SSRT2275)
245) Patch 00531.00 - Security (SSRT2275)
246) Patch 00551.00 - Corrects improper file or privilege management
247) Patch 00650.00 - Correct potential buffer overflow
248) Patch 00653.00 - Correct improper file or privilege management
249) Patch 00703.00 - Correct improper file or privilege management

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101 108 118-124 126 152-154 157-159

250) Patch 00716.00 - Performance enhancement for IPsec
251) Patch 00718.00 - Provides correct labels for mach events
252) Patch 00720.00 - Fix for audit subsystem utilities
253) Patch 00733.00 - Correct improper file or privilege management
254) Patch 00745.00 - Correct improper file or privilege management
255) Patch 00756.00 - Correct improper file or privilege management
256) Patch 00764.00 - Correct improper file or privilege management
257) Patch 00783.00 - Fix buffer overflow and improper file access
258) Patch 00791.00 - Correct improper file access
259) Patch 00817.00 - Correct improper file or privilege management
260) Patch 00823.00 - Revision to the sys_attrs_proc(5) reference page
261) Patch 00825.00 - Correct improper file access
262) Patch 00835.00 - Correct improper file access
263) Patch 00874.00 - Security (SSRT3469)
264) Patch 01060.00 - Migrate from /etc/svc.conf to /etc/nsswitch.conf
265) Patch 01067.00 - Migrate from /etc/svc.conf to /etc/nsswitch.conf
266) Patch 01072.00 - Security (SSRT2275)
267) Patch 01077.00 - Correct edauth failure to write to root partition

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101 108 118-124 126 152-154 157-159

268) Patch 01079.00 - Migrate from /etc/svc.conf to /etc/nsswitch.conf
269) Patch 01084.00 - volsave, volrestore saves nconfig/nlog policies
270) Patch 01086.00 - Correct improper file access
271) Patch 01106.00 - Corrects lastlogin.sh script
272) Patch 01118.00 - Security (SSRT0785U)
273) Patch 01122.00 - Fix for incorrect conversion by XmCvtXmStringToCT
274) Patch 01124.00 - Fix for incorrect conversion by XmCvtXmStringToCT
275) Patch 01126.00 - Security (SSRT0711U)
276) Patch 01130.00 - Corrects improper memory handling in dxkerneltuner
277) Patch 01139.00 - Patch resolves a symlink problem
278) Patch 01151.00 - Corrects improper file access
279) Patch 01160.00 - Corrects improper file access
280) Patch 01168.00 - Corrects local and remote security domain risks
281) Patch 01184.00 - Fixes ksh memory fault while logging in
282) Patch 01186.00 - Corrects local and remote security domain risks
283) Patch 01201.00 - Fixes an autofs panic during an unmount
284) Patch 01205.00 - Corrects improper file access
285) Patch 01225.00 - Fix for /sbin/rc2.d/S19security script

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101 108 118-124 126 152-154 157-159

286) Patch 01241.00 - fixfdmn may fail to correct a domain
287) Patch 01259.00 - Update for cflow utility
288) Patch 01276.00 - Security (SSRT3518)
289) Patch 01278.00 - screend filters packets with unresolvable hostnames
290) Patch 01288.00 - Eliminate warnings from Sysman Security Config Tool
291) Patch 01290.00 - Corrects improper file access
292) Patch 01294.00 - Updates for sort command
293) Patch 01304.00 - Resolves the symlink problem
```

Example C-2: Removing Patches Installed with a New Style Patch kit (cont.)

```
294) Patch 01310.00 - Corrects symlink problem
295) Patch 01314.00 - Corrects improper file access
296) Patch 01316.00 - Corrects improper file access
297) Patch 01320.00 - Corrects improper file access
298) Patch 01324.00 - Corrects improper file access
299) Patch 01326.00 - Security (SSRT1-45U)
300) Patch 01332.00 - Corrects improper file access
301) Patch 01349.00 - Fix for dtterm core dump
302) Patch 01353.00 - Corrects improper file access
303) Patch 01357.00 - Fix ftp client accounting error

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101 108 118-124 126 152-154 157-159

304) Patch 01361.00 - During CDSA configuration mod_install core dumps
305) Patch 01365.00 - Eliminate use of a /tmp file in SysMan CLI example
306) Patch 01375.00 - Updates audit_tool usage message
307) Patch 01377.00 - Correct improper file access
308) Patch 01402.00 - Provides the chatr(1) reference page
309) Patch 01408.00 - Correct potential buffer overflow
310) Patch 01414.00 - Add EV7 mixed speed interval timer support
311) Patch 25012.00 - SP04 OSFC2SEC540
312) Patch 25102.00 - SP04 OSFCDABASE540 (SSRT3518)
313) Patch 25106.00 - SP04 OSFIPSECBASE540 (SSRT3629A)
314) Patch 25107.00 - SP04 OSFLDPAUTH540
315) Patch 25113.00 - SP04 OSFSSHBASE540 (SSRT3588 SSRT2275)
316) Patch 25114.00 - SP04 OSFSSOSSL540 (SSRT3622)
317) Patch 25115.00 - SP04 OSFSSOW2K540

- Tru64_UNIX_V5.1B / Software Development Environment Patches:
318) Patch 00535.00 - Corrects problems in dbx and object file tools
319) Patch 00537.00 - Fixes various problems in libc functions

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101 108 118-124 126 152-154 157-159 311-317

320) Patch 00541.00 - Fixes various problems in libc functions
321) Patch 00839.00 - Fixes problems in dbx and object file tools
322) Patch 01070.00 - Performance tool failures on Sierra Cluster (PFS)
323) Patch 01264.00 - Assembler treats octal constants as decimal values
324) Patch 25021.00 - SP04 OSFCMPLRS540 (SSRT2439 SSRT2384 SSRT2341 ...)
325) Patch 25030.00 - SP04 OSFEXAMPLES540
326) Patch 25038.00 - SP04 OSFINCLUDE540
327) Patch 25070.00 - SP04 OSFRCS540
328) Patch 25072.00 - SP04 OSFSCCS540 (SSRT2275)
329) Patch 25073.00 - SP04 OSFSDES540

- Tru64_UNIX_V5.1B / System Administration Patches:
330) Patch 00330.00 - Allows evmd to stop listening on default tcp port 619
331) Patch 00452.00 - Modifications for environmental monitoring facilities
332) Patch 00731.00 - Update to pmgrd IoRate Statistics feature
333) Patch 00762.00 - Fix for SysMan Station failure
334) Patch 00774.00 - Fix for dirclean utility
335) Patch 00781.00 - Adds pmAdvfs.MIB to define ADVFS MIB definitions

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101 108 118-124 126 152-154 157-159 311-317 324-329

336) Patch 01081.00 - Migrate from /etc/svc.conf to /etc/nsswitch.conf
337) Patch 01096.00 - Update for sysman menu layout in help volume
338) Patch 01100.00 - Fixes hang when doing browser Reload for SysMan Tools
339) Patch 01102.00 - Handling spaces in sysman Account Manager search
340) Patch 01158.00 - New features and bug fixes for xmesh
341) Patch 01166.00 - Adapter Deconfigure stops cluster alias routing
342) Patch 01170.00 - Update mclistbox.tcl file to handle screen updates
343) Patch 01180.00 - Update sysman dns/bindconfig for nsswitch support
344) Patch 01182.00 - Update sysman dns/bindconfig for nsswitch support
345) Patch 01203.00 - Patch turns on envmond on ES47/ES80/GS1280 Servers
346) Patch 01217.00 - dxproctuner not displaying any data in fr_FR local
347) Patch 01223.00 - Corrected label strings in sysman LSM application
348) Patch 01229.00 - Fix for SysMan Station core dump
349) Patch 01298.00 - Configuring DHCP client corrupts /etc/hosts file
350) Patch 01340.00 - Restarting network causes Insight Manager to fail
351) Patch 01355.00 - SysMan tool problem after installing Java 1.3.1-4
352) Patch 01359.00 - Fix for Null Pointer Exception in LSMSA GUI
353) Patch 01379.00 - Addition of pmgrd_iorate.config file for pmgrd daemon

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101 108 118-124 126 152-154 157-159 311-317 324-329

354) Patch 01404.00 - Provides fixes for the collect utility
355) Patch 25001.00 - SP04 OSFACCT540
356) Patch 25028.00 - SP04 OSFENVMON540
```

Example C-2: Removing Patches Installed with a New Style Patch kit (cont.)

```
357) Patch 25031.00 - SP04 OSFEXER540
358) Patch 25077.00 - SP04 OSFSERVICETOOLS540
359) Patch 25079.00 - SP04 OSFSYSMAN540 (SSRT1-42U SSRT1-41U SSRT1-40U)
360) Patch 25100.00 - SP04 OSFXSYSMAN540

- Tru64_UNIX_V5.1B / Threads Patches:
361) Patch 00268.00 - Installs version V2.1-120 of libots3 libraries
362) Patch 00270.00 - Installs version V2.1-120 of libots3 libraries
363) Patch 00766.00 - Installs DECthreads V3.20-033
364) Patch 00768.00 - Installs DECthreads V3.20-033

- Tru64_UNIX_V5.1B / VM Patches:
365) Patch 01064.00 - Allows per-binary bigpage tuning
366) Patch 01162.00 - Vmstat incorrect kernel per-RAD memory usage

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101 108 118-124 126 152-154 157-159 311-317 324-329 355-360

- Tru64_UNIX_V5.1B / X11 Patches:
367) Patch 00279.00 - Corrections to Oxygen VX1 graphics card XCopyPlane
368) Patch 00332.00 - Fixes memory leak in the Panoramix/Xinerama Extension
369) Patch 00622.00 - Hang occurs with various PowerStorm graphics options
370) Patch 01147.00 - OpenGL library missing two extensions
371) Patch 01266.00 - Fixes various problems with the X font server
372) Patch 01268.00 - Fixes various problems with the X font server
373) Patch 25053.00 - SP04 OSFLSMX11540
374) Patch 25075.00 - SP04 OSFSER540
375) Patch 25085.00 - SP04 OSFX11540
376) Patch 25086.00 - SP04 OSFXADMIN540
377) Patch 25089.00 - SP04 OSFXDEMOS540
378) Patch 25094.00 - SP04 OSFXLIBA540
379) Patch 25095.00 - SP04 OSFXMIT540
380) Patch 25110.00 - SP04 OSFOPENGL540

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101 108 118-124 126 152-154 157-159 311-317 324-329 355-360 373-380

- TruCluster_V5.1B / Cluster Filesystem Patches:
381) Patch 00067.00 - Fixes a cfsd core dumping problem
382) Patch 00138.00 - Fixes a cfsmgr core dump
383) Patch 00154.00 - Corrects LSM partition types in CNX partition
384) Patch 25001.00 - SP04 TCRBASE540 (SSRT2265)

- TruCluster_V5.1B / Cluster Kernel Patches:
385) Patch 00136.00 - Improve scalability for ip reassembly on smp machines
386) Patch 00143.00 - Fixes a kernel memory fault in ICS
387) Patch 00148.00 - Fixes unaligned kernel access in cluster I/O stack
388) Patch 00150.00 - Fix rdg:unwiring problem in RDG with local transfers
389) Patch 00156.00 - Correct lock acquires after mpsleep
390) Patch 00161.00 - Fixes memory leak in memory channel transport layer

- TruCluster_V5.1B / Cluster Services Patches:
391) Patch 00019.00 - Fix for Oracle start-up failure
392) Patch 00026.00 - Problems with lsm disks and cluster quorum tool

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101 108 118-124 126 152-154 157-159 311-317 324-329 355-360 373-380 384

393) Patch 00065.00 - Resolves problem with caa_register command
394) Patch 00074.00 - Fix for caa_report
395) Patch 00105.00 - aliasd terminates all gated before restarting
396) Patch 00127.00 - Enables CAA to startup and failover system services
397) Patch 00140.00 - Fix address already in use msgs from klogin, kshell
398) Patch 00168.00 - caa_relocate does not kill the autofsd

- TruCluster_V5.1B / Distributed Lock Manager Patches:
399) Patch 00152.00 - Fix for dlm panic during call to dlm_get_lkinfo()

- TruCluster_V5.1B / Hardware Configuration Patches:
400) Patch 00014.00 - Cluster specific fix for mounting cluster root domain

- TruCluster_V5.1B / Kernel Patches:
401) Patch 00158.00 - Fixes multiple assert_wait and timeout panics

- TruCluster_V5.1B / Memory Channel Patches:
402) Patch 00145.00 - MC-API call imc_ckerrcnt_mr() returns error

--- MORE TO FOLLOW ---
Add to your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101 108 118-124 126 152-154 157-159 311-317 324-329 355-360 373-380 384

403) Patch 00163.00 - Fixes superfluous rm_event, index too big messages
```

Example C-2: Removing Patches Installed with a New Style Patch kit (cont.)

- TruCluster_V5.1B / Security Related Patches:
 - 404) Patch 00166.00 - Security (SSRT2265)
- TruCluster_V5.1B / System Administration Patches:
 - 405) Patch 00035.00 - Fix for cluster alias manager SUITlet

The following choices override your previous selections:

- 406) ALL of the above
- 407) CANCEL selections and redisplay menus
- 408) EXIT without deleting any patches

Add to your choices, choose an overriding action or
press RETURN to confirm previous selections.

Choices (for example, 1 2 4-6): 47-60 80-82 85 100-101 108 118-124 126 152-154 157-159 311-317 324-329 355-360 373-380 384

You are deleting the following patches:

- Tru64_UNIX_V5.1B / Commands, Shells, & Utilities Patches:
 - Patch 25022.00 - SP04 OSFDCMT540
 - Patch 25023.00 - SP04 OSFDCMTEXT540
 - Patch 25026.00 - SP04 OSFDOSTOOLS540
 - Patch 25046.00 - SP04 OSFLAT540
 - Patch 25049.00 - SP04 OSFLEARN540
 - Patch 25064.00 - SP04 OSFOBSOLETE540
 - Patch 25068.00 - SP04 OSFPGMR540 (SSRT2275)
 - Patch 25080.00 - SP04 OSFTCLBASE540
 - Patch 25084.00 - SP04 OSFUUCP540 (SSRT2301 SSRT2275)
- Tru64_UNIX_V5.1B / Common Desktop Environment (CDE) Patches:
 - Patch 25013.00 - SP04 OSFCDAPP540
 - Patch 25014.00 - SP04 OSFCDDEV540
 - Patch 25015.00 - SP04 OSFCDDET540 (SSRT2405)
 - Patch 25016.00 - SP04 OSFCDMAIL540
 - Patch 25019.00 - SP04 OSFCDMIN540 (SSRT3589)

Press RETURN to display the next screen:

- Tru64_UNIX_V5.1B / Filesystem Patches:
 - Patch 25002.00 - SP04 OSFADVFS540 (SSRT2275)
 - Patch 25003.00 - SP04 OSFADVFSBIN540
 - Patch 25062.00 - SP04 OSFNFS540
- Tru64_UNIX_V5.1B / Hardware Configuration Patches:
 - Patch 25036.00 - SP04 OSFHWBINCOM540
- Tru64_UNIX_V5.1B / I/O Device Handling Patches:
 - Patch 25034.00 - SP04 OSFHWBASE540
 - Patch 25035.00 - SP04 OSFHWBIN540
- Tru64_UNIX_V5.1B / Installation Patches:
 - Patch 25071.00 - SP04 OSFRIS540
- Tru64_UNIX_V5.1B / Kernel Patches:
 - Patch 25007.00 - SP04 OSFATMBIN540
 - Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)
 - Patch 25010.00 - SP04 OSFBIN540 (SSRT2323 SSRT2275 SSRT2266)

Press RETURN to display the next screen:

- Patch 25011.00 - SP04 OSFBINCOM540 (SSRT2275)
 - Patch 25045.00 - SP04 OSFKTOOLS540
 - Patch 25051.00 - SP04 OSFLSMBASE540 (SSRT2275)
 - Patch 25052.00 - SP04 OSFLSMBIN540
- Tru64_UNIX_V5.1B / Library Patches:
 - Patch 25050.00 - SP04 OSFLIBA540 (SSRT2275)
- Tru64_UNIX_V5.1B / Network Patches:
 - Patch 25020.00 - SP04 OSFCLINET540 (SSRT3653 SSRT2384 SSRT2275 ...)
 - Patch 25039.00 - SP04 OSFINET540 (SSRT3653 SSRT2408 SSRT2368)
 - Patch 25060.00 - SP04 OSFNETCONF540 (SSRT3674)
- Tru64_UNIX_V5.1B / Printers Patches:
 - Patch 25069.00 - SP04 OSFPRINT540
- Tru64_UNIX_V5.1B / Reference Page Patches:
 - Patch 25054.00 - SP04 OSFMANOP540
 - Patch 25055.00 - SP04 OSFMANOS540 (SSRT2275)

Press RETURN to display the next screen:

- Tru64_UNIX_V5.1B / Security Related Patches:
 - Patch 25012.00 - SP04 OSFC2SEC540
 - Patch 25102.00 - SP04 OSFCDATABASE540 (SSRT3518)
 - Patch 25106.00 - SP04 OSFIPSECBASE540 (SSRT3629A)
 - Patch 25107.00 - SP04 OSFLDPAUTH540
 - Patch 25113.00 - SP04 OSFSSHBASE540 (SSRT3588 SSRT2275)
 - Patch 25114.00 - SP04 OSFSSOSSL540 (SSRT3622)
 - Patch 25115.00 - SP04 OSFSSOW2K540

Example C-2: Removing Patches Installed with a New Style Patch kit (cont.)

```
- Tru64_UNIX_V5.1B / Software Development Environment Patches:
  Patch 25021.00 - SP04 OSFCMPLRS540 (SSRT2439 SSRT2384 SSRT2341 ...)
  Patch 25030.00 - SP04 OSFEXAMPLES540
  Patch 25038.00 - SP04 OSFINCLUDE540
  Patch 25070.00 - SP04 OSFRCS540
  Patch 25072.00 - SP04 OSFSCCS540 (SSRT2275)
  Patch 25073.00 - SP04 OSFSDE540

- Tru64_UNIX_V5.1B / System Administration Patches:
  Patch 25001.00 - SP04 OSFACCT540

Press RETURN to display the next screen:

  Patch 25028.00 - SP04 OSFENVMON540
  Patch 25031.00 - SP04 OSFEXER540
  Patch 25077.00 - SP04 OSFSERVICETOOLS540
  Patch 25079.00 - SP04 OSFSYSMAN540 (SSRT1-42U SSRT1-41U SSRT1-40U)
  Patch 25100.00 - SP04 OSFXSYSMAN540

- Tru64_UNIX_V5.1B / X11 Patches:
  Patch 25053.00 - SP04 OSFLSMX11540
  Patch 25075.00 - SP04 OSFSER540
  Patch 25085.00 - SP04 OSFX11540
  Patch 25086.00 - SP04 OSFXADMIN540
  Patch 25089.00 - SP04 OSFXDEMOS540
  Patch 25094.00 - SP04 OSFXLIBA540
  Patch 25095.00 - SP04 OSFXMIT540
  Patch 25110.00 - SP04 OSFOPENGL540

- TruCluster_V5.1B / Cluster Filesystem Patches:
  Patch 25001.00 - SP04 TCRBASE540 (SSRT2265)

Is this correct? (y/n): y

Checking patch dependency...
(dependent upon the number of patches you select, this may take awhile)

*** Deleting 63 patches ***

***** CAUTION *****
Interruption of this phase of the operation will corrupt your
operating system software and compromise the patch database
integrity.

DO NOT Ctrl/C, power off your system, or in any other way
interrupt the patch operation. The patch operation is complete
when you are returned to the Patch Utility menus.
*****
Before continuing, the whole cluster will be brought down to init level 2.

Press RETURN to continue...
Waiting for Event Management system to reconfigure...done
Waiting for all cluster members to complete event operation...

=== Deleting "Tru64 UNIX V5.1B" patches:
Deleting "Patch: SP04 OSFOPENGL540" (OSFPAT02511000540).
Deleting "Patch: SP04 OSFXMIT540" (OSFPAT02509500540).
Deleting "Patch: SP04 OSFXLIBA540" (OSFPAT02509400540).
Deleting "Patch: SP04 OSFXDEMOS540" (OSFPAT02508900540).
Deleting "Patch: SP04 OSFXADMIN540" (OSFPAT02508600540).
Deleting "Patch: SP04 OSFX11540" (OSFPAT02508500540).
Deleting "Patch: SP04 OSFSER540" (OSFPAT02507500540).
Deleting "Patch: SP04 OSFLSMX11540" (OSFPAT02505300540).
Deleting "Patch: SP04 OSFXSYSMAN540" (OSFPAT02510000540).
Deleting "Patch: SP04 OSFSYSMAN540 (SSRT1-42U SSRT1-41U SSRT1-40U)" (OSFPAT02507900540).
-----
- Tru64_UNIX_V5.1B / System Administration Patches:
  Patch 25079.00 - SP04 OSFSYSMAN540 (SSRT1-42U SSRT1-41U SSRT1-40U)

Customization found in ./etc/.proto..doprc.

Before the backup was restored, we had saved a copy of this file in:

./etc/.proto..doprc.PreDel_OSFPAT02507900540

Please compare ./etc/.proto..doprc with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/.proto..doprc manually.

./etc/.proto..doprc.PreDel_OSFPAT02507900540
can be removed afterwards.
-----
- Tru64_UNIX_V5.1B / System Administration Patches:
  Patch 25079.00 - SP04 OSFSYSMAN540 (SSRT1-42U SSRT1-41U SSRT1-40U)

Customization found in ./etc/doprc.

Before the backup was restored, we had saved a copy of this file in:
```

Example C-2: Removing Patches Installed with a New Style Patch kit (cont.)

```
./etc/doprc.PreDel_OSFPAT02507900540

Please compare ./etc/doprc with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/doprc manually.

./etc/doprc.PreDel_OSFPAT02507900540
can be removed afterwards.
-----
Deleting "Patch: SP04 OSFSERVICETOOLS540" (OSFPAT02507700540).
Deleting "Patch: SP04 OSFEXER540" (OSFPAT02503100540).
Deleting "Patch: SP04 OSFENVMON540" (OSFPAT02502800540).
Deleting "Patch: SP04 OSFACCT540" (OSFPAT02500100540).
Deleting "Patch: SP04 OSFSDE540" (OSFPAT02507300540).
Deleting "Patch: SP04 OSFSCCS540 (SSRT2275)" (OSFPAT02507200540).
Deleting "Patch: SP04 OSFRCS540" (OSFPAT02507000540).
Deleting "Patch: SP04 OSFINCLUDE540" (OSFPAT02503800540).
Deleting "Patch: SP04 OSFEXAMPLES540" (OSFPAT02503000540).
Deleting "Patch: SP04 OSFCMPLRS540 (SSRT2439 SSRT2384 SSRT2341 ...)" (OSFPAT02502100540).
Deleting "Patch: SP04 OSFSOW2K540" (OSFPAT02511500540).
Deleting "Patch: SP04 OSFSOSSSL540 (SSRT3622)" (OSFPAT02511400540).
Deleting "Patch: SP04 OSFSSHBASE540 (SSRT3588 SSRT2275)" (OSFPAT02511300540).
Deleting "Patch: SP04 OSFLDPAUTH540" (OSFPAT02510700540).
Deleting "Patch: SP04 OSFIPSECBASE540 (SSRT3629A)" (OSFPAT02510600540).
Deleting "Patch: SP04 OSFCD SABASE540 (SSRT3518)" (OSFPAT02510200540).
Deleting "Patch: SP04 OSFC2SEC540" (OSFPAT02501200540).
Deleting "Patch: SP04 OSFMANOS540 (SSRT2275)" (OSFPAT02505500540).
Deleting "Patch: SP04 OSFMANOP540" (OSFPAT02505400540).
Deleting "Patch: SP04 OSFPRINT540" (OSFPAT02506900540).
Deleting "Patch: SP04 OSFNETCONF540 (SSRT3674)" (OSFPAT02506000540).
Deleting "Patch: SP04 OSFINET540 (SSRT3653 SSRT2408 SSRT2368)" (OSFPAT02503900540).
-----
- Tru64_UNIX_V5.1B / Network Patches:
  Patch 25039.00 - SP04 OSFINET540 (SSRT3653 SSRT2408 SSRT2368)

Customization found in ./usr/var/yp/.proto..Makefile.

Before the backup was restored, we had saved a copy of this file in:

./usr/var/yp/.proto..Makefile.PreDel_OSFPAT02503900540

Please compare ./usr/var/yp/.proto..Makefile with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./usr/var/yp/.proto..Makefile manually.

./usr/var/yp/.proto..Makefile.PreDel_OSFPAT02503900540
can be removed afterwards.
-----
- Tru64_UNIX_V5.1B / Network Patches:
  Patch 25039.00 - SP04 OSFINET540 (SSRT3653 SSRT2408 SSRT2368)

Customization found in ./usr/var/yp/Makefile.

Before the backup was restored, we had saved a copy of this file in:

./usr/var/yp/Makefile.PreDel_OSFPAT02503900540

Please compare ./usr/var/yp/Makefile with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./usr/var/yp/Makefile manually.

./usr/var/yp/Makefile.PreDel_OSFPAT02503900540
can be removed afterwards.
-----
Deleting "Patch: SP04 OSFCLINET540 (SSRT3653 SSRT2384 SSRT2275 ...)" (OSFPAT02502000540).
-----
- Tru64_UNIX_V5.1B / Network Patches:
  Patch 25020.00 - SP04 OSFCLINET540 (SSRT3653 SSRT2384 SSRT2275 ...)

Customization found in ./etc/.proto..inetd.conf.

Before the backup was restored, we had saved a copy of this file in:

./etc/.proto..inetd.conf.PreDel_OSFPAT02502000540

Please compare ./etc/.proto..inetd.conf with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/.proto..inetd.conf manually.

./etc/.proto..inetd.conf.PreDel_OSFPAT02502000540
can be removed afterwards.
-----
- Tru64_UNIX_V5.1B / Network Patches:
  Patch 25020.00 - SP04 OSFCLINET540 (SSRT3653 SSRT2384 SSRT2275 ...)

Customization found in ./etc/inetd.conf.
```

Example C-2: Removing Patches Installed with a New Style Patch kit (cont.)

```
Before the backup was restored, we had saved a copy of this file in:

./etc/inetd.conf.PreDel_OSFPAT02502000540

Please compare ./etc/inetd.conf with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/inetd.conf manually.

./etc/inetd.conf.PreDel_OSFPAT02502000540
can be removed afterwards.
-----
- Tru64_UNIX_V5.1B / Network Patches:
  Patch 25020.00 - SP04 OSFCLINET540 (SSRT3653 SSRT2384 SSRT2275 ...)

Customization found in ./etc/.proto..protocols.

Before the backup was restored, we had saved a copy of this file in:

./etc/.proto..protocols.PreDel_OSFPAT02502000540

Please compare ./etc/.proto..protocols with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/.proto..protocols manually.

./etc/.proto..protocols.PreDel_OSFPAT02502000540
can be removed afterwards.
-----
- Tru64_UNIX_V5.1B / Network Patches:
  Patch 25020.00 - SP04 OSFCLINET540 (SSRT3653 SSRT2384 SSRT2275 ...)

Customization found in ./etc/protocols.

Before the backup was restored, we had saved a copy of this file in:

./etc/protocols.PreDel_OSFPAT02502000540

Please compare ./etc/protocols with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/protocols manually.

./etc/protocols.PreDel_OSFPAT02502000540
can be removed afterwards.
-----
Deleting "Patch: SP04 OSFLIBA540 (SSRT2275)" (OSFPAT02505000540).
Deleting "Patch: SP04 OSFLSMBIN540" (OSFPAT02505200540).
Deleting "Patch: SP04 OSFLSMBASE540 (SSRT2275)" (OSFPAT02505100540).
Deleting "Patch: SP04 OSFKTOOLS540" (OSFPAT02504500540).
pax: No input
-----
Can not restore member specific files of subset OSFPAT02504500540 on member member0
-----
pax: No input
-----
Can not restore member specific files of subset OSFPAT02504500540 on member member1
-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25045.00 - SP04 OSFKTOOLS540

Customization found in ./usr/var/kdbx/.proto..system.kdbxrc.

Before the backup was restored, we had saved a copy of this file in:

./usr/var/kdbx/.proto..system.kdbxrc.PreDel_OSFPAT02504500540

Please compare ./usr/var/kdbx/.proto..system.kdbxrc with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./usr/var/kdbx/.proto..system.kdbxrc manually.

./usr/var/kdbx/.proto..system.kdbxrc.PreDel_OSFPAT02504500540
can be removed afterwards.
-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25045.00 - SP04 OSFKTOOLS540

Customization found in ./usr/var/kdbx/system.kdbxrc.

Before the backup was restored, we had saved a copy of this file in:

./usr/var/kdbx/system.kdbxrc.PreDel_OSFPAT02504500540

Please compare ./usr/var/kdbx/system.kdbxrc with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./usr/var/kdbx/system.kdbxrc manually.
```

Example C-2: Removing Patches Installed with a New Style Patch kit (cont.)

```
./usr/var/kdbx/system.kdbxrc.PreDel_OSPFAT02504500540
can be removed afterwards.

-----
Deleting "Patch: SP04 OSFBINCOM540 (SSRT2275)" (OSFPAT02501100540).
Deleting "Patch: SP04 OSFBIN540 (SSRT2323 SSRT2275 SSRT2266)" (OSFPAT02501000540).
Deleting "Patch: SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)" (OSFPAT02500900540).
-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./etc/.proto..magic.

Before the backup was restored, we had saved a copy of this file in:

./etc/.proto..magic.PreDel_OSPFAT02500900540

Please compare ./etc/.proto..magic with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/.proto..magic manually.

./etc/.proto..magic.PreDel_OSPFAT02500900540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./etc/magic.

Before the backup was restored, we had saved a copy of this file in:

./etc/magic.PreDel_OSPFAT02500900540

Please compare ./etc/magic with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/magic manually.

./etc/magic.PreDel_OSPFAT02500900540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./etc/nsswitch.conf.

Before the backup was restored, we had saved a copy of this file in:

./etc/nsswitch.conf.PreDel_OSPFAT02500900540

Please compare ./etc/nsswitch.conf with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/nsswitch.conf manually.

./etc/nsswitch.conf.PreDel_OSPFAT02500900540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./etc/.proto..rc.config.

Before the backup was restored, we had saved a copy of this file in:

./etc/.proto..rc.config.PreDel_OSPFAT02500900540

Please compare ./etc/.proto..rc.config with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/.proto..rc.config manually.

./etc/.proto..rc.config.PreDel_OSPFAT02500900540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./etc/rc.config.

Before the backup was restored, we had saved a copy of this file in:

./etc/rc.config.PreDel_OSPFAT02500900540

Please compare ./etc/rc.config with this saved copy.
```

Example C-2: Removing Patches Installed with a New Style Patch kit (cont.)

```
If there are extra customizations you want to keep, you would need
to merge them into ./etc/rc.config manually.

./etc/rc.config.PreDel_OSFPAT02500900540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./etc/.proto..svc.conf.

Before the backup was restored, we had saved a copy of this file in:

./etc/.proto..svc.conf.PreDel_OSFPAT02500900540

Please compare ./etc/.proto..svc.conf with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/.proto..svc.conf manually.

./etc/.proto..svc.conf.PreDel_OSFPAT02500900540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./etc/svc.conf.

Before the backup was restored, we had saved a copy of this file in:

./etc/svc.conf.PreDel_OSFPAT02500900540

Please compare ./etc/svc.conf with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/svc.conf manually.

./etc/svc.conf.PreDel_OSFPAT02500900540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./etc/.proto..sysconfigtab.

Before the backup was restored, we had saved a copy of this file in:

./etc/.proto..sysconfigtab.PreDel_OSFPAT02500900540

Please compare ./etc/.proto..sysconfigtab with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/.proto..sysconfigtab manually.

./etc/.proto..sysconfigtab.PreDel_OSFPAT02500900540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./etc/sysconfigtab.

Before the backup was restored, we had saved a copy of this file in:

./etc/sysconfigtab.PreDel_OSFPAT02500900540

Please compare ./etc/sysconfigtab with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/sysconfigtab manually.

./etc/sysconfigtab.PreDel_OSFPAT02500900540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./sbin/.proto..bcheckrc.

Before the backup was restored, we had saved a copy of this file in:

./sbin/.proto..bcheckrc.PreDel_OSFPAT02500900540

Please compare ./sbin/.proto..bcheckrc with this saved copy.

If there are extra customizations you want to keep, you would need
```

Example C-2: Removing Patches Installed with a New Style Patch kit (cont.)

```
to merge them into ./sbin/.proto..bcheckrc manually.

./sbin/.proto..bcheckrc.PreDel_OSFPAT02500900540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./sbin/bcheckrc.

Before the backup was restored, we had saved a copy of this file in:

./sbin/bcheckrc.PreDel_OSFPAT02500900540

Please compare ./sbin/bcheckrc with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./sbin/bcheckrc manually.

./sbin/bcheckrc.PreDel_OSFPAT02500900540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./sbin/init.d/.proto..rmtmpfiles.

Before the backup was restored, we had saved a copy of this file in:

./sbin/init.d/.proto..rmtmpfiles.PreDel_OSFPAT02500900540

Please compare ./sbin/init.d/.proto..rmtmpfiles with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./sbin/init.d/.proto..rmtmpfiles manually.

./sbin/init.d/.proto..rmtmpfiles.PreDel_OSFPAT02500900540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./sbin/init.d/rmtmpfiles.

Before the backup was restored, we had saved a copy of this file in:

./sbin/init.d/rmtmpfiles.PreDel_OSFPAT02500900540

Please compare ./sbin/init.d/rmtmpfiles with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./sbin/init.d/rmtmpfiles manually.

./sbin/init.d/rmtmpfiles.PreDel_OSFPAT02500900540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./usr/skel/.proto...login.

Before the backup was restored, we had saved a copy of this file in:

./usr/skel/.proto...login.PreDel_OSFPAT02500900540

Please compare ./usr/skel/.proto...login with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./usr/skel/.proto...login manually.

./usr/skel/.proto...login.PreDel_OSFPAT02500900540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./usr/skel/.login.

Before the backup was restored, we had saved a copy of this file in:

./usr/skel/.login.PreDel_OSFPAT02500900540

Please compare ./usr/skel/.login with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./usr/skel/.login manually.
```

Example C-2: Removing Patches Installed with a New Style Patch kit (cont.)

```
./usr/skel/.login.PreDel_OSPAT02500900540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./usr/var/cluster/members/member0/spool/cron/crontabs/.proto..root.

Before the backup was restored, we had saved a copy of this file in:

./usr/var/cluster/members/member0/spool/cron/crontabs/.proto..root.PreDel_OSPAT02500900540

Please compare ./usr/var/cluster/members/member0/spool/cron/crontabs/.proto..root with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./usr/var/cluster/members/member0/spool/cron/crontabs/.proto..root manually.

./usr/var/cluster/members/member0/spool/cron/crontabs/.proto..root.PreDel_OSPAT02500900540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / Kernel Patches:
  Patch 25009.00 - SP04 OSFBASE540 (SSRT3631 SSRT3469 SSRT2439 ...)

Customization found in ./usr/var/cluster/members/member0/spool/cron/crontabs/root.

Before the backup was restored, we had saved a copy of this file in:

./usr/var/cluster/members/member0/spool/cron/crontabs/root.PreDel_OSPAT02500900540

Please compare ./usr/var/cluster/members/member0/spool/cron/crontabs/root with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./usr/var/cluster/members/member0/spool/cron/crontabs/root manually.

./usr/var/cluster/members/member0/spool/cron/crontabs/root.PreDel_OSPAT02500900540
can be removed afterwards.

-----
Deleting "Patch: SP04 OSFATMBIN540" (OSFPAT02500700540).
Deleting "Patch: SP04 OSFRIS540" (OSFPAT02507100540).
Deleting "Patch: SP04 OSFHWBIN540" (OSFPAT02503500540).
Deleting "Patch: SP04 OSFHWBASE540" (OSFPAT02503400540).
-----
- Tru64_UNIX_V5.1B / I/O Device Handling Patches:
  Patch 25034.00 - SP04 OSFHWBASE540

Customization found in ./etc/.proto..ddr.dbase.

Before the backup was restored, we had saved a copy of this file in:

./etc/.proto..ddr.dbase.PreDel_OSPAT02503400540

Please compare ./etc/.proto..ddr.dbase with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/.proto..ddr.dbase manually.

./etc/.proto..ddr.dbase.PreDel_OSPAT02503400540
can be removed afterwards.

-----
- Tru64_UNIX_V5.1B / I/O Device Handling Patches:
  Patch 25034.00 - SP04 OSFHWBASE540

Customization found in ./etc/ddr.dbase.

Before the backup was restored, we had saved a copy of this file in:

./etc/ddr.dbase.PreDel_OSPAT02503400540

Please compare ./etc/ddr.dbase with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/ddr.dbase manually.

./etc/ddr.dbase.PreDel_OSPAT02503400540
can be removed afterwards.

-----
Deleting "Patch: SP04 OSFHWBINCOM540" (OSFPAT02503600540).
Deleting "Patch: SP04 OSFNFS540" (OSFPAT02506200540).
Deleting "Patch: SP04 OSFADVFSBIN540" (OSFPAT02500300540).
Deleting "Patch: SP04 OSFADVFS540 (SSRT2275)" (OSFPAT02500200540).
Deleting "Patch: SP04 OSFCDEMIN540 (SSRT3589)" (OSFPAT02501900540).
Deleting "Patch: SP04 OSFCDEMAIL540" (OSFPAT02501600540).
Deleting "Patch: SP04 OSFCDEDT540 (SSRT2405)" (OSFPAT02501500540).
Deleting "Patch: SP04 OSFCDEDEV540" (OSFPAT02501400540).
Deleting "Patch: SP04 OSFCDEAPP540" (OSFPAT02501300540).
```

Example C-2: Removing Patches Installed with a New Style Patch kit (cont.)

```
Deleting "Patch: SP04 OSFUUCP540 (SSRT2301 SSRT2275)" (OSFPAT02508400540).
Deleting "Patch: SP04 OSFTCLBASE540" (OSFPAT02508000540).
Deleting "Patch: SP04 OSFPGMR540 (SSRT2275)" (OSFPAT02506800540).
Deleting "Patch: SP04 OSFOBSOLETE540" (OSFPAT02506400540).
Deleting "Patch: SP04 OSFLEARN540" (OSFPAT02504900540).
Deleting "Patch: SP04 OSFLAT540" (OSFPAT02504600540).
Deleting "Patch: SP04 OSFDOSTOOLS540" (OSFPAT02502600540).
Deleting "Patch: SP04 OSFDCMTEXT540" (OSFPAT02502300540).
Deleting "Patch: SP04 OSFDCMT540" (OSFPAT02502200540).

=== Deleting "TruCluster Server V5.1B" patches:
Deleting "Patch: SP04 TCRBASE540 (SSRT2265)" (TCRPAT02500100540).
-----

- TruCluster_V5.1B / Cluster Filesystem Patches:
  Patch 25001.00 - SP04 TCRBASE540 (SSRT2265)

Customization found in ./etc/.proto..clua_services.

Before the backup was restored, we had saved a copy of this file in:

./etc/.proto..clua_services.PreDel_TCRPAT02500100540

Please compare ./etc/.proto..clua_services with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/.proto..clua_services manually.

./etc/.proto..clua_services.PreDel_TCRPAT02500100540
can be removed afterwards.

-----
- TruCluster_V5.1B / Cluster Filesystem Patches:
  Patch 25001.00 - SP04 TCRBASE540 (SSRT2265)

Customization found in ./etc/clua_services.

Before the backup was restored, we had saved a copy of this file in:

./etc/clua_services.PreDel_TCRPAT02500100540

Please compare ./etc/clua_services with this saved copy.

If there are extra customizations you want to keep, you would need
to merge them into ./etc/clua_services manually.

./etc/clua_services.PreDel_TCRPAT02500100540
can be removed afterwards.

-----
*** KERNEL CONFIGURATION AND BUILD PROCEDURE ***

Saving /sys/conf/SABER as /sys/conf/SABER.bck

*** PERFORMING KERNEL BUILD ***

A log file listing special device files is located in /dev/MAKEDEV.log
Working....Sat Mar 13 11:12:09 EST 2004

The new kernel is /sys/SABER/vmunix
Waiting for all cluster members to complete event operation...
Waiting for all cluster members to complete event operation...
Waiting for other cluster members to reboot...

Existing kernel copied to cluster/members/{memb}/boot_partition/vmunix.PrePatch.

New Kernel (/sys/SABER/vmunix) copied to
cluster/members/{memb}/boot_partition/vmunix.

*** successfully deleted 63 patches; failed to delete 0 patches ***

* A system reboot of the patched system is required for the successfully deleted patches.
```

C.3 Gathering Baseline Information

The example in this section shows how to use `dupatch` to perform a patch baseline analysis. You can perform this operation in either single-user or multiuser mode.

Example C-3: Performing a Patch Baseline Analysis

```
# cd /patches/pk4/patch_kit
# ./dupatch

Tru64 UNIX Patch Utility (Rev. 46-00)
=====
- This dupatch session is logged in //var/adm/patch/log/session.log

Main Menu:
-----

1) Patch Kit Installation
2) Patch Kit Deletion
3) Patch Kit Documentation

4) Patch Tracking
5) Patch Baseline Analysis/Adjustment

h) Help on Command Line Interface

q) Quit

Enter your choice: 5

Patch Baseline Analysis and Adjustment
=====

This section of the patch management utility does not actually install
patches. It is an enabler and need only be used to baseline your
system for routine use of setld-based patch kits. It is recommended that
you read the release notes accompanying this kit, prior to continuing.

It is specifically designed to provide continuity from an environment with
manually installed operating system patches to one that can be managed
using the standard 'setld' installation technology.

This baselining is broken into phases that assess and report the state of
your operating system files. It will only make changes to your system with
your confirmation.

Phase 1 - System Evaluation

Where possible, this phase determines the origin of changed operating
system files and detects formally released official patches that were

-----
Press <RETURN> to continue viewing:
-----

manually installed.

Phase 2 - Report patches with inter-product inventory conflicts

Some layered products ship operating system files or files delivered
by other layered products. If you have any of these layered products
installed on your system and the patch kit happens to contain those
files with inventory conflicts, the Patch Utility will block the
installation of the patches containing inventory conflicts since it
may corrupt the layered product operation.

Phase 3 - Create installation records for manually-installed patches

During this phase, you will be shown a list of patches that match
the files on your system, but are not marked as 'installed'. You will
be offered an opportunity to mark these patches as 'installed'. This
involves copying valid 'setld' database information to your system.

Phase 4 - Report changed system files

This phase provides information to help you make choices later in
this process. It reports both 'missing' and files whose origin
cannot be determined. Some of these files may affect patch
installation. You will want to consider this information when you
later make decisions in phase 5.

Phase 5 - Enable patches with file applicability conflicts

This phase allows you to enable subsequent installation of patches
whose inventory does not match the installed system. This occurs
when:
```

Example C-3: Performing a Patch Baseline Analysis (cont.)

- 1) System files changed and the origin of that change cannot be determined, or
- 2) The changed files can only be traced back to previous manual patches, or
- 3) The original file to be patched is missing from the system, or
- 4) Hard links to files about to be patched are broken

It is recommended that you do not enable the installation of these patches, if any, until you have tracked down the origin of the files that are in conflict, or you may compromise the integrity of your operating system.

Press <RETURN> to continue viewing:

To assist you in this effort, the file list for the entire patch with the known information will be displayed. You may run through this phase to get the analysis without enabling the installation of any of the listed patches.

It is recommended that you backup your operating system prior to the actual patch installation.

Do you want to proceed with the analysis and adjustment? [y/n]: **y**

- This Patch Baseline Analysis/Adjustment session is logged in:
//var/adm/patch/log/baseline.log

KITNAME><T64V50AS0001-20011008> OSF500

Phase 1 - System Evaluation

=====

This evaluation compares the contents of your patch kit to the state of files already installed on your system regardless of their origin.

The amount of time needed to complete this phase can vary greatly depending on the size of the patch kit, the version of the Operating System, and the performance of the system.

* system evaluation completed.

Press RETURN to proceed to the next phase...

Phase 2 - Report patches with inter-product inventory conflicts

=====

Some layered products replace files delivered in the original Operating System inventory or other layered products' inventory. The Patch Utility will block installation of those patches with inventory conflicts since they could compromise the integrity of the layered products.

* no inter-product inventory conflicts detected.

Press RETURN to proceed to the next phase...

Phase 3 - Create installation records for manually installed patches

=====

You can choose to copy valid installation records to your system for the following patches, if any. This will allow future management and reporting for patches to your operating system.

Creating installation records is intended to establish a baseline to which future patches might be applied. Future patch removal may only ever occur to this baseline.

* no manually installed patches detected.

Press RETURN to proceed to the next phase...

Example C-3: Performing a Patch Baseline Analysis (cont.)

Phase 4 - Report changed system files and missing files
=====

This phase provides information to help you make choices later in this process. It reports both 'missing' and files whose origin cannot be determined. Some of these files may affect patch installation. You will want to consider this information when you later make decisions in phase 5.

* no changed files detected

Press RETURN to proceed to the next phase...

Phase 5 - Enable patches with file applicability conflicts
=====

You will be shown a list of patches, if any, and their files. Patches show up during this phase when:

- 1) System files changed and the origin of that change cannot be determined, or
- 2) The changed files can only be traced back to previous manual patches, or
- 3) The file to be patched is missing from the system, or
- 4) Hard links to files about to be patched are broken

After reviewing this section, you can elect to enable the installation of these patches using a standard selection menu. Enabling a patch means that the checks for patch file applicability, done during patch installation, will be bypassed if you later choose to install that patch through the installation section of dupatch.

It is recommended that you understand the origin of the listed files before enabling a patch for installation.

* no patches with file applicability conflicts detected.

* Baseline Analysis/Adjustment process completed.
=====

Press RETURN to get back to the Main Menu...

Tru64 UNIX Patch Utility (Rev. 46-00)

=====

- This dupatch session is logged in //var/adm/patch/log/session.log

Main Menu:

- 1) Patch Kit Installation
- 2) Patch Kit Deletion
- 3) Patch Kit Documentation
- 4) Patch Tracking
- 5) Patch Baseline Analysis/Adjustment
- h) Help on Command Line Interface
- q) Quit

Enter your choice: 1

Tru64 UNIX Patch Utility (Rev. 46-00)

=====

- This dupatch session is logged in //var/adm/patch/log/session.log

Patch Installation Menu:

- 1) Pre-Installation Check ONLY
- 2) Check & Install (requires single-user mode)
- b) Back to Main Menu
- q) Quit

Enter your choice: 2

Example C-3: Performing a Patch Baseline Analysis (cont.)

```

        This operation can be performed in single-user mode only.

Tru64 UNIX Patch Utility (Rev. 46-00)
=====
- This dupatch session is logged in //var/adm/patch/log/session.log

Patch Installation Menu:
-----

1) Pre-Installation Check ONLY
2) Check & Install (requires single-user mode)

b) Back to Main Menu
q) Quit

Enter your choice: q
```

C.4 Preinstallation Check Failure

The following example shows a preinstallation check that discovered problems. To install a new style patch kit on this system, you would need to run the baselining procedure to enable these patches for installation.

Example C-4: Performing a Preinstallation Check

```
# cd /patches/pk4/patch_kit
# ./dupatch

Tru64 UNIX Patch Utility (Rev. 46-00)
=====
- This dupatch session is logged in /var/adm/patch/log/session.log

Patch Installation Menu:
-----

1) Pre-Installation Check ONLY
2) Check & Install in single-user mode w/ network services
3) Check & Install in Multi-User mode

b) Back to Main Menu
q) Quit

Enter your choice: 1

Checking patch kit for transmission errors during download...

Finished Checking patch kit checksums

Gathering patch information...
(dependent upon the size of the patch kit, this may take awhile)
:
:

Your current setup of "/var/adm/patch/backup" is:

    * A plain directory (not a mount point or a symbolic link)

Do you want to proceed with the pre-installation check with this setup? [y]:

Checking patch prerequisites and patch file applicability...
(dependent upon the number of patches you select, this may take awhile)

*** Installing 78 patches ***
-----
Problem installing:

- I18N_UNIX_V5.1B / Kernel Patches:
  Patch 25103.00 - SP04 IOSJPBIN540
  ./sys/BINARY/jin.mod:
    its origin can not be identified.

  ./sys/BINARY/strjin.mod:
```

Example C-4: Performing a Preinstallation Check (cont.)

```
        its origin can not be identified.

./usr/sbin/kkcd:
        its origin can not be identified.

This patch will not be installed.

-----
Problem installing:

- I18N_UNIX_V5.1B / Kernel Patches:
  Patch 25215.00 - SP04 IOSWWBIN540
  ./sys/BINARY/alddtty.mod:
        its origin can not be identified.

  ./sys/BINARY/utx.mod:
        its origin can not be identified.

  ./usr/sbin/utxd:
        its origin can not be identified.

This patch will not be installed.

-----

* The following 2 patch(es) failed in prerequisite/file applicability check:

Press RETURN to proceed...

- I18N_UNIX_V5.1B / Kernel Patches:
  Patch 25103.00 - SP04 IOSJPBIN540
  Patch 25215.00 - SP04 IOSWWBIN540

* There were 2 patch(es) which failed in prerequisite/file applicability check:

Press Return to go back to the previous menu

Tru64 UNIX Patch Utility (Rev. 46-00)
=====
- This dupatch session is logged in /var/adm/patch/log/session.log

Patch Kit Installation Menu:
-----

1) Pre-Installation Check ONLY
2) Check & Install in single-user mode w/ network services
3) Check & Install in Multi-User mode

b) Back to Main Menu
q) Quit

Enter your choice: b
```

Using dupatch from the Command Line

The `dupatch` utility provides a command-line interface that allows `dupatch` to be called by other programs. You can use the command line to invoke all functions except for baselining. The functions have the same operation and definition as the menu-driven interface. For information about using the command-line interface, see the `dupatch(8)` reference page, which is installed on your system when you install the patch-kit tools and is documented in this appendix.

D.1 Installing and Removing Patches

The following example shows the use of the `dupatch` command and several of its options to install Patch 8.01 from a Version 5.0A kit:

```
/usr/sbin/dupatch -install -kit /var/b115/patch_kit -name Joe -note \  
"install patch" -product TRU64_UNIX_V5.0A -patch 08.01
```

The following example shows the use of the `dupatch` command and several of its options to remove Patch 8.01 from a Version 5.0A kit:

```
/usr/sbin/dupatch -delete -name Joe -note "delete patch" \  
-product TRU64_UNIX_V5.0A -patch 08.01
```

You must specify all mandatory options on the command line or in a data file. If any mandatory option is missing, the command will fail with an appropriate error message; it will not prompt you for the missing option and information.

D.2 Removing the New Style Patch Kits

If you need to uninstall a new style patch kit, we recommend that you use `dupatch` in interactive mode rather than from the command line. Because you must remove all patches, you would have to specify each of this kit's patches on the command line. With 60 or more patches in a kit, removing them using the command line would be a difficult, time-consuming task.

Although you can use the `-delete -patch all` option on the command line, doing so removes all `setld`-installed patches from your system, including CSPs and the patches from previous patch kits. You should therefore use this option only if patches from the new style patch kit are the only ones installed on your system. Use the `-track` option to determine if your system contains any other patches.

By using `dupatch` in interactive mode, selecting `delete` from the menu causes `dupatch` to display all of the patches on your system. You can then easily select only the patches from the new style patch kit. See Section C.2 for a complete example of removing this patch kit using `dupatch` interactively.

D.3 Deleting a CSP

You delete a CSP the same way you delete a release patch. The patch number you specify with the `-patch` option is the CSP's PatchID. The following steps describe how to find the PatchID:

1. Determine which kit the patch was delivered in. For example, `T64KIT0020665-V51BB22-ES-20031113.tar`. (For information about identifying the fields in this CSP name, see the Patch Kit Overview and

Naming document at <http://h30097.www3.hp.com/docs/patch/naming/TITLE.HTM>.)

2. View the text file that ships with kit. For example:

```
# more /var/adm/patch/doc/T64KIT0020665-V51BB22-ES-20031113.txt
```

The text files for CSP kits are also available on the Web at the patch kit download site, <http://www.itrc.hp.com/service/patch/mainPage.do>

3. Find the section of the text file that lists the PatchID. For example:

```
3 Summary of CSPatches contained in this kit
```

```
Tru64 UNIX V5.1B
```

```
PatchId    Summary Of Fix
```

```
-----
```

```
C386.00    Fix for SSRT3653, BIND v8
```

4. Type the dupatch command line, using the CSP patch ID. For example:

```
# /usr/sbin/dupatch -delete -name "Sally G" -note \  
"delete CSP" -product TRU64_UNIX_V5.0B -patch C386.00
```

Notes

- Although a CSP kit can contain multiple patches, not all of them may be installed on your system.
 - When deleting a CSP patch, also delete any patches that are required by the patch.
-

D.4 dupatch Reference Page

This section provides the dupatch reference page, which is installed on your system when you install the patch installation tools.

NAME

dupatch - Installs, deletes and maintains software patch updates to the Tru64 UNIX operating system, the TruCluster software products, and (in later kits) the Worldwide Language Support (WLS) subset.

SYNOPSIS

/usr/sbin/dupatch

/usr/sbin/dupatch -help [-data_file] [-kit *kit_location*] [-patch_id] [-rev] [-product_id]

/usr/sbin/dupatch -install -kit *kit_location* -name *user_name* -note *user_note* -patch all | *patch_id* [*patch_id*]... [-cfgfile *config_file*] [-data *data_file*] [-noauto] [-nobackup] [-nolog] [-noroll] [-precheck_only] [-proceed] [-root *root_path*] -product [all | *product_id*] [-single_user]

/usr/sbin/dupatch -delete -name *user_name* -note *user_note* -patch all | *patch_id* [*patch_id*]... [-cfgfile *config_file*] [-data *data_file*] [-noauto] [-nolog] [-noroll] [-proceed] [-root *root_path*] [-product all | *product_id*] [-single_user]

/usr/sbin/dupatch -track -type [file | kit | patch] -kit *kit_location* [-data *data_file*] [-nolog] [-root *root_path*]

COMMAND KEYWORDS

-install *install-options*

Installs a software patch or patch kit.

-delete *delete-options*

Removes an installed patch or patches from the operating system. Patch deletion requires that the patch was installed as a reversible patch.

-track *track-options*

Constructs a history of patch installations and deletions. Information can be patch-kit specific or patch-file specific.

-help *help-options*

Requests quick help on dupatch. Supplying an argument will provide help specifically on that argument.

OPTIONS

Required -install Options

-kit *kit_location*

Specifies the location of the patch kit from which patches will be installed onto the system.

kit_location is a full path to the directory containing the patch kit.

-name *user_name*

Specifies the name to be recorded in `event.log`. Enclose the *user_name* in quotation marks if it contains space characters.

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`-note user_note`

Records user-supplied text in the event log. The *user_note* is a text string enclosed in quotation marks.

`-product all | product_id [product_id] ...`

Required when more than one product is installed.

Specifies the installed operating system and TruCluster software when installing patches from an old style patch kit. Product ID specifications are not case sensitive. Wildcards are not permitted.

When installing an inclusive patch kit, the use of *all* is mandatory. See Specifying a Product ID with `-product`.

`-patch all | patch_id [patch_id] ...`

Directs dupatch to install all (*all*) patches or specific (*patch_id*) patches from the specified patch kit.

When installing an inclusive patch kit, the use of *all* is mandatory. See Specifying a Patch ID with `-patch`.

Optional `-install` Options

`-cfgfile config_file`

Specifies a configuration file for rebuilding the kernel. See Specifying a Configuration File.

`-data data_file`

Specifies a file that contains arguments (in the form *argument = value*) to the dupatch command. See Using a Data File.

`-noauto`

Directs dupatch to not automatically rebuild the kernel if indicated by the patches installed. In addition, if running dupatch to install the patches in single-user mode, the system will not automatically reboot after the patch process is complete.

`-nobackup`

Directs dupatch to not retain backup information during a patch installation. This will remove the ability to back out an installed patch.

`-nolog`

Directs dupatch to not record actions in a `session.log` file.

`-noroll`

Directs dupatch to install patches on a cluster using the no-roll procedure rather than the default rolling-upgrade procedure.

`-precheck_only`

Directs dupatch to perform the preinstallation check but to not proceed with the patch installation. If `-precheck_only` is omitted, dupatch begins the

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installation process after the preinstallation check has been completed, as long as no patch failed the preinstallation check. The preinstallation check determines whether new patches that depend on the presence of other patches or software subsets can be installed. It does this by verifying that the required patches or software subsets are already installed onto the system.

`-proceed`

Directs dupatch to install any patches that passed the preinstallation check, even if one or more patches failed the preinstallation check. If `-proceed` is omitted, dupatch will not install any patches if at least one patch fails the preinstallation check. The preinstallation check determines whether new patches that depend on the presence of other patches or software subsets can be installed. It does this by verifying that the required patches or software subsets are already installed onto the system.

`-root root_path`

Specifies an alternate root location. The default *root_path* is `/` for all operations.

`-single_user`

If the system is presently in multiuser mode, brings the system down to single-user mode prior to installing patches.

`-rev`

Prints the current dupatch revision.

Required –delete Options

`-name user_name`

Specifies the name to be recorded in `event.log`. Enclose the *user_name* in quotation marks if it contains space characters.

`-note user_note`

Records user-supplied text in the event log. The *user_note* is a text string enclosed in quotation marks.

`-product all | product_id [product_id] ...`

Mandatory when more than one product is installed.

Specifies the installed operating system and TruCluster software when removing patches from an old sytle patch kit. Product ID specifications are not case sensitive. Wildcards are not permitted.

When removing an inclusive patch kit, the use of `all` is mandatory. See Specifying a Product ID with `-product`.

`-patch all | patch_id [patch_id] ...`

Directs dupatch to remove all (`all`) patches or specific (*patch_id*) patches from the specified patch kit.

When removing an inclusive patch kit, the use of `all` is mandatory. See Specifying a Patch ID with `-patch`.

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Optional **-delete** Options

`-data data_file`

Specifies a file that contains arguments (in the form *argument = value*) to the dupatch command. See Using a Data File.

`-nolog`

Directs dupatch to not record actions in a `session.log` file.

`-noroll`

Directs dupatch to remove patches on a cluster using the no-roll procedure rather than the default rolling-upgrade procedure.

`-proceed`

Directs dupatch to delete any patches that passed the predeletion check, even if one or more patches failed the predeletion check. If `-proceed` is omitted, dupatch will not delete any patches if at least one patch failed the predeletion check. The predeletion check determines whether any installed patches have dependencies on any of the patches listed for removal. If such dependencies exist, dupatch blocks the removal of any required patch.

`-root root_path`

Specifies an alternate root location. The default *root_path* is `/` for all operations.

Required **-track** Options

`-type file`

`-type kit`

`-type patch`

Lists all patched files (`-file`), installed patch kits (`-kit`), or installed patches (`-patch`).

Optional **-track** Options

`-data data_file`

Specifies a file that contains arguments (in the form *argument = value*) to the dupatch command. See Using a Data File.

`-kit kit_location`

Identifies the location of the patch kit for which the reports will cover.

kit_location is a full path to the directory containing the patch kit.

`-nolog`

Directs dupatch to not record actions in a `session.log` file.

`-root root_path`

Specifies an alternate root location. The default *root_path* is `/` for all operations.

DESCRIPTION

The `dupatch` utility is an interactive program used to install and delete software patches to the Tru64 UNIX operating system and systems running TruCluster software products.

With `dupatch` you can baseline your system to incorporate any system files that may have been manually installed. You can also use `dupatch` to obtain a list of installed patches or view the system history of patch installations and deletions.

When invoked without arguments, `dupatch` is run interactively by providing menus that step you through the patching procedure while prompting you for necessary information. Alternatively, you can invoke `dupatch` from the command line, whereby you supply required arguments to the `dupatch` command.

Although you can install patches in either single-user or multiuser mode, the use of single-user mode is strongly recommended. In multiuser mode, libraries and system files that are in use by active processes may be affected by the new patches. The patching of any active library or system files may result in unexpected consequences.

Beginning with Version 5.1B Patch Kit 4 (base level 25), patch kits are packaged as “inclusive patch kits,” which require all patches in the kit to be installed or removed together. Therefore, you cannot use the following options with an inclusive patch kit:

- `/usr/sbin/dupatch -install -patch patch_id`
- `/usr/sbin/dupatch -delete -patch patch_id`

Attempting to use the `patch_id` option will cause the command to fail.

Inclusive patch kits will also install patches for the Worldwide Language Support (WLS) subset if the WLS subset is installed on your system.

On clustered systems running TruCluster software Version 5.0A or higher, the `dupatch` utility is run in conjunction with the rolling upgrade procedure. (See the *Patch Kit Installation Instructions* or the *Cluster Installation* manual for information about performing a rolling upgrade.)

Using a Data File

The `data_file` that you specify with the `-data` option is a fully qualified file location and a file that contains command-line options with the following format:

```
option1 = value
option2 = value
:
option3 = n
```

For example:

```
kit = /mnt
name = Joe
note = Installing April patch kit
product = Tru64_UNIX_V5.1
patch = 27.01 63.00 74 83.01
product = TruCluster_V5.1
# multiple patches are separated by space characters
patch = 21.01 27.01 40
precheck_only
nobackup
```

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Blank lines and comments (preceded with #) are allowed. Line continuation (\) is required if a specification spans multiple lines. Only one *data_file* is permitted per command line and nested *data_file* specifications are not allowed.

Specifying a Product ID with **-product**

When installing or removing an inclusive patch kit, you must specify all with the **-product** option. For example:

```
./dupatch -install -product all -patch all -name Joe -note \  
"installing pk4" -kit .
```

For old style patch kits, the *product_id* you specify with **-product** is one of the following:

```
TRU64_UNIX_V5.1B  
TRU64_UNIX_V5.1A  
TRU64_UNIX_V5.1  
TRU64_UNIX_V5.0A  
TRU64_UNIX_V5.0  
TRU64_UNIX_V4.0G  
TRU64_UNIX_V4.0F  
DIGITAL_UNIX_V4.0D
```

```
TruCluster_V5.1B  
TruCluster_V5.1A  
TruCluster_V5.1  
TruCluster_V5.0A  
TruCluster_V1.6  
TruCluster_V1.5
```

- A *product_id* specification is not necessary when the system being patched has only one product installed; for example, Tru64 UNIX Version 4.0F with no TruCluster software product.
- A *product_id* specification only applies to the *patch_id* specifications that follow it and ends when another *product_id* is specified.
- Because the purpose of the *product_id* is to clarify the *patch_id* specification, the *product_id* must precede the *patch_id*.
- Product strings are not case sensitive. Wildcards are not permitted.

The following example shows the use of a product string with an old style patch kit:

```
/pk3/patch_kit/dupatch -install -product DIGITAL_UNIX_V4.0F -patch 1.1 \  
-product TruCluster_V1.6 -patch 35 -name Joe -note \  
"installing patch 1.1" -kit /pk3/patch_kit
```

Specifying a Patch ID with **-patch**

You must specify all with the **-patch** option when installing or removing an inclusive patch kit. For example:

```
./dupatch -install -product all -patch all \  
-name Joe -note "installing pk4" -kit .
```

For old style patch kits, the *patch_id* you specify with the **-patch** option has the following format:

```
xxxx[.yy]
```

For example:

```
15  
200.11  
10.2  
00111.02
```

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- Both *xxxx* and *yy* are numeric values; leading zeros can be omitted.
- Patch revision (*yy*), when left unspecified, maps to wildcarded "??"
- Multiple *patch_id* specifications are separated by white space.
- The keyword *all* cannot be combined with other patch IDs.
- If *product_id* is used, *patch_id* must come after it.

The following example shows the use of the *-patch* option with an old style patch kit:

```
/pk3/patch_kit/dupatch -install -product DIGITAL_UNIX_V4.0F -patch 1.1 \  
-product TruCluster_V1.6 -patch 35 -name Joe -note \  
"installing patch 1.1" -kit /pk3/patch_kit
```

Specifying a Root Path

The *root_path* you specify with the *-root* option specifies an alternative root for the specified operation. (The *-root* option is similar to the *-D* option of *setld*.) The following list describes characteristics of the *-root* option.

- The root path must be the root of a complete UFS file system or AdvFS domain.
- The default root path is */* for all operations.
- If *-root* is the only argument on the command line, *dupatch* will proceed in interactive mode; this is an exception to the command-line rule previously mentioned.
- When performing an alternate root installation, the *-noauto* flag is set implicitly.

Specifying a Configuration File

The *-cfgfile* option to the *-install* and *-delete* command options allows you to call in the system configuration file (*/usr/sys/conf/config_file*). For information about creating or modifying a *config_file*, see the *doconfig(8)* and *sizer(8)* reference pages.

RESTRICTIONS

The following restrictions apply to the *dupatch* utility.

You must be logged in as *root* to run *dupatch*.

The system must be running in single-user mode when removing patches.

The *-product* option must precede the *-patch* option on the command line.

EXIT STATUS

- | | |
|----------|--------------------|
| 0 (Zero) | Success. |
| >0 | An error occurred. |

ERRORS

See the Patch Kit Installation Instructions for a detailed list of *dupatch* error messages.

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EXAMPLES

1. The following interactive example shows how to invoke the menu-driven interface of dupatch:

```
# dupatch

Tru64 UNIX Patch Utility (Rev. 46-00)
=====
- This dupatch session is logged in /var/adm/patch/log/session.log

Main Menu:
-----

1) Patch Installation
2) Patch Deletion

3) Patch Documentation
4) Patch Tracking

5) Patch Baseline Analysis/Adjustment

h) Help on Command Line Interface

q) Quit

Enter your choice: 1
```

2. The following interactive example shows how to perform a preinstallation check on patch 00183.00 contained in the kit located at `/mnt/patch_kit`. This will verify that the specified patch can be installed onto the system without actually proceeding with the installation:

```
# dupatch -install -kit /mnt/patch_kit -name Jessica -note \
"Pre-Installation check only on 183.00" -patch 183.00 -precheck_only
```

3. The following interactive example shows how to install all patches in kit located at `/mnt/patch_kit`:

```
# dupatch -install -kit /mnt/patch_kit -name Jessica \
-note "install all patches" -patch all
```

4. The following interactive example shows how to identify all patches installed on system:

```
# dupatch -track -type patch
```

5. The following interactive example shows how to list all system files updated by installed patches:

```
# dupatch -track -type file
```

6. The following interactive example shows how to remove patch 00183.00 from the system. Note that the system will automatically be rebooted upon patch deletion because `-noauto` was not specified:

```
# dupatch -delete -patch 183.00 -name Joe \
-note "delete patch 00183.00 from system"
```

7. The following interactive example shows how to obtain help on specifying `patch_id` usage:

```
# dupatch -help patch_id
```

ENVIRONMENT VARIABLES

The following environment variables affect the execution of dupatch:

MAX_LOGS

Specifies the maximum number of session logs to be retained on the system. The default number is 25. If, for example, MAX_LOGS is set to 25, the oldest session log would be named `session.log.24` and the current would be named `session.log`, with no number affixed.

_ROOT

Overrides the location of the root directory. The default value is `/`, the system root directory. This value must be the top-level directory of a file system (or an AdvFS domain).

PATCHDIR

Specifies the path to the patch tools repository. The default value is `$_ROOT/var/adm/patch`.

FILES

`/var/adm/patch/log/session.log.n`

This file captures dupatch activities. A separate session log is written with each dupatch session and log files from the previous sessions are saved. The order is first in, first out, with `session.log.$MAX_LOGS` as the oldest file.

`/var/adm/patch/log/Dupatch_load_Date.log`

This file specifies the date when the patch tools were loaded or updated onto the system.

`/var/adm/patch/log/baseline.log.n`

This file records the screen output from the baselining session. A separate baseline log is written for each baselining session and log files from previous sessions are saved. The order is first in, first out, with `session.log.$MAX_LOGS` as the oldest file.

`/var/adm/patch/log/event.log.n`

This file captures information regarding patch installation and removal operations. A separate event log is written each time patches are installed or removed. Log files from previous sessions are saved. The order is first in, first out, with `session.log.$MAX_LOGS` as the oldest file.

`/var/adm/patch/backup`

The files in this directory are used to restore the system to its former state if patches are deleted.

`/var/adm/patch/doc/OSFPAT*patch_no.abs`

Provides brief summary of what a patch fixes.

`/var/adm/patch/doc/OSFPAT*patch_no.txt`

Provides detailed discussion of what a patch fixes.

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`root-path/usr/.smdb./OSFPAT*.inv`

Lists the subset inventory files.

`root-path/usr/.smdb./OSFPAT*.ctrl`

Lists the subset control files.

`root-path/usr/.smdb./OSFPAT*.scp`

Lists the subset inventory programs.

`root-path/usr/.smdb./OSFPAT*.lk`

Lists the subset installed lock files.

SEE ALSO

Commands: `setld(8)`, `clu_upgrade(8)`

Documents:

Patch Kit Installation Instructions

Patch Summary and Release Notes for the patch kit to be installed

Tru64 UNIX Installation Guide

Tru64 UNIX System Administration guide

TruCluster Software Products Software Installation guide

TruCluster Software Products Cluster Administration guide

baselining

A dupatch feature that looks at the files installed on a system, compares them to the files it expects to find, and prevents the installation of any patch files that might cause an incompatibility among system files.

Customer-Specific Patch (CSP) Kit

A patch kit that is developed and made available to resolve a problem for a specific customer. A Customer-Specific patch is developed with prior knowledge of that customer's unique hardware and software configuration and environment. Customer-Specific patches may not be useful for another customer's system. An Early Release patch is a type of CSP.

See also *Early Release Patch (ERP) Kit*, *Release Patch Kit*

dupatch

A utility included in a patch kit that installs, removes, and manages patches for Tru64 UNIX and TruCluster software products. This utility is installed and left on the system through the successful installation of a patch kit.

Early Release Patch (ERP) Kit

A patch kit that contains a patch or patches that will be included in a Release Patch Kit that is still under development. ERPs, which are a type of Customer-Specific patch, are provided by HP to help customers who have an immediate need for some specific functionality that will be included in an upcoming Release Patch Kit.

See also *Customer-Specific Patch (CSP) Kit*, *Release Patch Kit*

inclusive patch kit

See *new style patch kit*

new style patch kit

Also called an inclusive patch kit, a new style patch kit is a Release Patch Kit that provides an improved way of delivering patches. Among the ways that a new style patch kit differs from its predecessors is that it requires an all or none installation and removal of the patches in that kit. The first Tru64 UNIX new style patch kit was Version 5.1B Patch Kit 4 (Base Level 25).

See also *Release Patch Kit*

no-roll patching

A process that patches your cluster in one operation and requires only one reboot of the whole cluster to complete the operation. This method was developed for mission-critical environments to provide a way to apply patches quickly, with a minimum amount of down time.

The no-roll patch process is a modification of dupatch; that is, all patches are installed or removed entirely using the dupatch utility, as opposed to the `clu_upgrade` and `dupatch` utilities used in the rolling upgrade procedure. The no-roll process conducts significantly fewer operations than the rolling upgrade procedure.

See also *rolling upgrade*

official patch

See *Release Patch Kit*

old style patch kit

See *new style patch kit*

patch

A file or a collection of files that contain fixes to problems. When possible, patches are merged together into one patch if they have intersecting files or codedependencies. A patch may correct one or more problems.

Each patch is packaged in its own `setld` subset. The subsets are managed by a utility named `dupatch`.

patch applicability

A file-by-file check of system files to determine whether a patch might cause a system to be degraded or crash. The installation of a patch is blocked if any system files to be replaced by that patch are not valid predecessors of the patch files.

Release Patch Kit

A patch kit that HP provides to modify a specific version of the Tru64 UNIX operating system and TruCluster software. Sometimes referred to as official patch kits, Release Patches Kits are intended for worldwide distribution and can be safely used on any customer's system within the guidelines documented in the kit. The patches in a Release Patch Kit are referred to as Release patches.

See also *Customer-Specific Patch (CSP) Kit*, *Early Release Patch (ERP) Kit*, *new style patch kit*

rolling upgrade

A software upgrade of a cluster that is performed while the cluster is in operation. One member at a time is rolled and returned to operation while the cluster transparently maintains a mixed-version environment for the base operating system, cluster, and Worldwide Language Support (WLS) software. Clients accessing services are not aware that a rolling upgrade is in progress.

On Version 5.0A and higher systems, you use a rolling upgrade to patch a cluster or to update the Tru64 UNIX operating system or TruCluster software on a cluster. The procedure is the same for both types of upgrades — the only difference is the command you run during the install stage of the rolling upgrade procedure.

See also *no-roll patching*

setld

An interactive program for installing and managing software subsets. Software products are organized into subsets that can be loaded, deleted, inventoried, and configured. The load operation reads software from disk, tape, CD-ROM, or an Internet installation server. The patch installation tool, `dupatch`, is based on the `setld` program.

tar file

A file created with the `tar` command that saves and restores multiple files in a single file. Tru64 UNIX patch kits are provided as tar files (except for kits included on a Patch CD-ROM).

version switch

During a rolling upgrade, a version switch manages the transition of the active version to the new version of an operating system. The active version is the one that is currently in use. The purpose of a version switch in a cluster is to prevent the introduction of potentially incompatible new features until all members have been updated.

See also *rolling upgrade*

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