

Chapter 6

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Patches

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While disk arrays and mirroring provide terrific protection from hardware failures, software failures and operator errors are not hindered in their destructive ability.

Source:

HP-UX Patch Management, A guide to patching HP-UX 11.X systems, September 2001

Introduction

HP-UX patch names have the following format:

```
PHxx_yyyyy
```

where:

PH	Patch HP-UX
xx	area patched
CO	general HP-UX commands
KL	Kernel Patch
NE	network specific patches
SS	all other subsystems: X11, Starbase, etc
yyyyy	unique number

The number `yyyyy` is unique across all areas (or categories). The installation of kernel and networking patches modifies the kernel (`/stand/vmunix`) and is therefore always followed by a reboot.

Commands and subsystem patches do not enforce a reboot of the system but applications depending on the patched files may need to be restarted. You will find detailed information about this in the “special installation section” of the [patch text](#).

Differences in patching between the HP-UX releases

Changes from UX 10.20 to UX 11.00 - Patch as individual

There has been a significant change in the way patching works from HP-UX 10.X to 11.X. Whereas with 10.X a patch was nothing more than a regular product we can distinguish between regular products and patches at UX 11.X. This has several advantages. The basic differences between 10.X and 11.X patching are:

- Patches are recognized by their „patch“ attribute and not by their naming (eg. `PHKL_12345`).
- There is a strict relation between a product and the patch that affects the filesets of this product. So each time you install, update or remove a product the corresponding patch(es) are also installed, updated or removed. E.g. if you install a product from a certain depot, SD-UX automatically installs the appropriate patches for the product if they are also contained in the depot.
- Patches are classified into certain categories which allows a more flexible way of patch management.
- Each patch has a superseding flag which eases the administration, especially if a product has been patched more than one time.

- the `swinstall` option `-x match_target` is replaced by the more specific option `-x patch_match_target` for 11.X patches.
- `swlist` displays patches even if their successor(s) is installed. Such patches have the `superseded` flag.
- `swlist` displays exactly which filesets are patched by a patch and which revision and architecture we're dealing with.

ATTENTION: A consequence of these enhancements is that 11.X patches and products can only be handled by 11.X systems. 11.X software depots must not be handled or even stored on 10.X systems. The downward compatibility is given, i.e 10.X depots can be handled and stored on 11.X systems!

Detailed information about what changed from 10.X to 11.X patching can be found in the "HP-UX 11.X Patch Program White Paper" in the file `/usr/share/doc/patch_pgrm.txt` on any UX 11.00 system.

Changes from UX 11.00 to UX 11.11 - Patch dependencies

At HP-UX 11.00 all patch dependencies described in the patch text had to be verified manually. As of HP-UX 11.11 patch dependencies are enforced by prerequisite attributes in the patch depot.

As of HP-UX 11.11 SD-UX is patch supersession aware, i.e. if a dependent patch or a patch that supersedes it is installed on the system then the prerequisite will be satisfied. Since patches must be cumulative this will work.

Unfortunately prior to HP-UX 11.11 SD-UX was not patch supersession aware and therefore no prerequisites could be set. Doing so would make it impossible to install a patch unless the specified dependency is installed on the system and is not yet superseded by another patch as else the prerequisite no longer is satisfied.

Listing Patches

A patch can have the following **state** (as of UX 11.00):

applied	The patch is currently installed and can be rolled back using the <code>swremove</code> command.
committed	The patch is currently installed, but the patch's rollback files have been removed or were never created, since the flag <code>-x patch_save_files=false</code> was set during installation. Refer to the Patch Rollback section.
superseded	The patch is superseded by another installed patch. The superseding patch can be found using the <code>-a superseded_by</code> command-line option of <code>swlist</code> . It will switch back to <i>applied</i> or <i>committed</i> if you <code>swremove</code> (roll back) all superseding patch(es).

For troubleshooting we would like to get a complete view of the system, i.e. products and patches. Simply do:

```
# swlist -l product >swlist.out
```

You may also list the patches from the fileset point of view. To list all filesets on the system and the patch filesets that affect them including status, revision, etc. do:

```
# swlist -l patch
```

you may grep for all applied patches

```
# swlist -l patch | grep applied
```

and/or omit the superseded patches:

```
# swlist -l patch -x show_superseded_patches=false | grep applied
```

Remember that a patch may be listed more than once because it may affect multiple filesets

What patches are applied to a product or fileset. e.g. LVM:

```
# swlist -l fileset -a applied_patches LVM
```

Which filesets are patched by which patch:

```
# swlist -l patch -a applied_to \*.\*,c=patch
```

Is a specific patch or one of its successors installed:

```
# swlist -l patch -a supersedes -x show_superseded_patches=false | grep patch
```

NOTE: Listing patches can be eased with the [show_patches](#) tool. Invoke `show_patches` without options to obtain a neat list of all active patches on the system.

Installing Patches

SD-UX can handle patches (as well as regular products) in two different formats: *SD directory format* or *SD file format*. Refer to the [Software Distributor Chapter](#) for details. Which format you deal with depends on the source where you got the patches from.

The SD file as a *shell archive* (*shar*) in compressed form comparable to tar.

from the IT Resource Center

The ITRC (<http://itrc.hp.com>) serves HP customers as main support portal. After logging in you can find the *patch database* under the link *individual patches* below the *maintanance and support* section:

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

The patch database allows you to search for patches, download patches individually or in bundles, read the patch text and ratings, etc.

The ITRC offers the possibility to get patch notifications, i.e. to get an email when new patches are released that match your system.

There are several HP internal demo accounts. See

<http://www.grc.hp.com/docs/wwwedeliver/anzeigen.php3?datei=demo-login> (HP internal)

Each patch that you download from ITRC is provided as shell archive (shar file). This shar file contains the patchtext and the patch in SD file format.

You have the possibility to download patches:

- individually
- as tar archive (containing one or more individual patches)
- as zip or gzip file (the compressed tar file)

I strongly recommend to download in gzip format. On the one hand this saves download time and disk space and on the other hand this avoids the risk of getting corrupted files. Especially if you are using a browser on a Windows platform the ascii files may get filled up with special characters like ^M at the end of each line.

NOTE: If you just want to get one or two patches you may also access each patch directly via anonymous ftp:

ftp://ftp.itrc.hp.com/hp-ux_patches/ or
ftp://us-ffs.external.hp.com/hp-ux_patches/

a) Downloading and installing multiple patches

Copy the gzip file to the system, e.g. to a new directory `/tmp/patches/`, unzip it and extract the files:

```
# cd /tmp/patches
# gunzip patches.tar[1].gz
# tar xvf patches.tar[1]
x README_hp-ux, 1780 bytes, 4 tape blocks
x create_depot_hp-ux_11, 4599 bytes, 9 tape blocks
x PHKL_25233, 53469 bytes, 105 tape blocks
x PHKL_25389, 158621 bytes, 310 tape blocks
x PHNE_25084, 1157671 bytes, 2262 tape blocks
```

- Use the file command in order to verify that the format has not been corrupted during the download:

```
# file PHKL_25233
PHKL_25233:      shar file
```

- Now you can simply execute the contributed shell script `create_depot_hp-ux_11` to create a patchdepot. Anyway i will explain the manual procedure here because this script does not work if the patch dependencies are not resolved within the bundle.
- Each patch SD file contains two files, eg. `PHKL_25233.text` and `PHKL_25233.depot`. The `sh(1M)` command would unpack it:

```
# sh PHKL_25233
x - PHKL_25233.text
x - PHKL_25233.depot [compressed]
```

The **.text file** represents the so called *patchtext*. See section [Patchtext](#) for details.

The **.depot file** is a is a SD depot in **SD file format** that contains only one product - the patch itself:

```
# swlist -l product -s /tmp/patches/PHKL_25233.depot
# Initializing...
# Contacting target "myhost"
#
# Target:  myhost:/tmp/patches/PHKL_25233.depot

PHKL_25233      1.0                select(2) and poll(2) hang
```

NOTE: the .depot file is nothing but a **tar file** modified for SD-UX.

A single patch can be installed directly:

```
# swinstall -x autoreboot=true -s /tmp/PHKL_25233.depot \*
```

If you like to install multiple patches in shar format at once you may copy them into a single SD depot. So you do not have to reboot for each PHKL or PHNE patch.

Create a directory for the depot:

```
# mkdir /var/patch_depot
```

The following loop extracts the shar files in /tmp/patches and copies them into the depot /var/patch_depot:

```
# for i in /tmp/patches/PH??_*
> do
> sh $i
> swcopy -s $i.depot \* @ /var/patch_depot
> done
```

Check the content of the depot:

```
# swlist -l product -s /var/patch_depot
```

Install the depot:

```
# swinstall -x patch_match_target=true -x autoreboot=true\
-s /var/patch_depot \*
```

the option `patch_match_target` guarantees that only those patches will be installed, that have corresponding products on the system.

The option `autoreboot=true` confirms a reboot that may be necessary after the patch installation. Otherwise the installation would start in interactive mode.

from CD, DVD or DDS tape

Whereas the patches downloaded from the ITRC website are stored in **SD file format**, the

patches on CD, DVD or (as usually delivered from the HP Response Centers) on DDS tape are stored in **SD depot format**. Hence you can install directly from these media without having to copy the patches to a local depot on the system.

Here's how to install patches from a CD-ROM:

1) Mount CD-ROM:

```
# mount /dev/cdrom /SD_CDROM
```

NOTE: As of UX 11.00 the `swinstall/swcopy` command automatically mounts a CD if one is inserted.

2) Install a bundle (from the command line):

```
# swinstall -x patch_match_target=true -x autoreboot=true
-s /CD_CDROM/GOLDQPK11i
```

You have the possibility to order customized patch bundles from the HP Response Center, e.g. a set of mass storage related patches. Generally the Response Center delivers the patches in **SD format** on DDS tape. Install the patches using:

```
# swinstall -x autoreboot=true -x patch_match_target=true
-s /dev/rmt/0m
```

from Patch Server Police (HP only)

The server `police.grc.hp.com` is located in the Response Center in Ratingen (Germany) and acts as european reference system for HP-UX patches. It gets updated overnight from the world wide patch server. You can access it via anonymous ftp from the HP intranet:

ftp://police.grc.hp.com/hp-ux_patches/ (HP internal)

From systems within the HP intranet you may also access it using Software Distributor commands directly:

```
# swlist -l depot -s police.grc.hp.com
# Initializing...
# Target "police.grc.hp.com" has the following depot(s):
/PATCHDEPOT/PHKL_13431
/PATCHDEPOT/PHCO_10947
/PATCHDEPOT/PHCO_12097
/PATCHDEPOT/PHCO_9597
/PATCHDEPOT/PHCO_9602
...
```

To install a patch do:

```
# swinstall -s police.grc.hp.com:/PATCHDEPOT/PHCO_12097 \*
```

Verifying Patch Installation

The result of the patch installation can be seen in the `swagent` log file `/var/adm/sw/swagent.log`.

If any critical warnings or errors appear we strongly recommend to use the powerful [check_patches utility](#) in order to find the cause.

Removing Patches

In general we would recommend not to remove patches, if possible. Installing a successor is usually less risky, since patch dependencies may be violated by a patch removal.

Only if a patch is known to cause problems which are not fixed by any available successor the patch should be removed:

```
# swremove PHxx_yyyyy [PHxx_yyyyy ...]
```

If there are problems after installing a whole patch bundle and it is not possible to locate the patch(es) that causes the trouble, the bundle may be removed:

```
# swremove HWEEnable11i
```

Note that the standard patch bundles have undergone an intense testing phase and it is very unlikely that such a bundle causes trouble. It is more likely that certain patches in the bundle **uncover a hardware problem** that was hidden before.

Patch Text

The patchtext is an ASCII file that describes the patch in detail. It provides information about the patch in the following patch text fields:

- Name or 1Liner
- Size
- [Rating](#)
- Status
- Creation and post date
- Affected files
- Description of enhancements and bugfixes
- Dependencies
- Warnings
- Special installation instructions
- OS that incorporates the fix

A detailed description of all patch fields can be found here:
http://wtec.cup.hp.com/~patches/catalog/catalog_labels.html (HP internal)

For UX 11.X the patchtext is stored to `/var/adm/sw/products/PHxx_yyyy/pfiles/README` during installation. It can be displayed using:

```
# swlist -a readme PHxx_yyyyy
```

NOTE: For UX 10.X the patchtext is handled separately.

The HP internal Patch Catalog Browser <http://wtec.cup.hp.com/~patches/catalog/> provides a neater **html version** of the patch texts.

Patch Ratings

The Rating field in the [patch text](#) will contain one of the following confidence ratings for each platform/OS combination for which the patch applies, as well as the date the rating was achieved (initially set on 00/03/10):

Rating 1 (1 star)

The patch has successfully completed testing by the developing lab. Patches with a rating of '1' are recommended for reactive situations when a patch with a higher rating is not available to address the problem.

Rating 2 (2 stars)

The patch has successfully completed testing by the developing lab -AND- is at least 21 days old and has been distributed at least 50 times by the Worldwide Response Centers -OR- is at least 90 days old and has been distributed at least 5 times by the Worldwide Response Centers (prior to March 12, 2002 the latter criteria was 46 days old with 5 downloads). Patches with a rating of '2' are recommended for reactive and proactive situations when a patch with a higher rating is not available.

Rating 3 (3 stars)

The patch has successfully completed testing by the developing lab -AND- by the Enterprise Patch Test Center. Patches with a rating of '3' are recommended in all reactive and proactive situations.

Patch Category Tags

Category tags identify the type of patch. Possible values can be one or combinations of:

- **critical** Fixes one or more of the critical conditions depicted above under "Critical:".
- **panic** Fixes a system panic.
- **halts_system** Fixes a problem that leads to a system halt or hang.
- **corruption** Fixes a data corruption problem.
- **memory_leak** Fixes a memory loss problem that may lead to severe performance degradation and/or system halt.
- **defect_repair** Fixes a software defect.
- **hardware_enablement** Provides support for new hardware.
- **enhancement** Provides new functionality.
- **general_release** Should be installed on any system with the appropriate software installed.
- **special_release** Should only be installed under specific conditions.

- `trial_patch` Preliminary patch. Should be replaced by the `general_release` or `special_release` version as it becomes available.

Patch Rollback

All files that have been overwritten by a patch will be backed up in the directory

```
/var/adm/sw/patch/PHxx_yyyyy/    for UX 10.X
/var/adm/sw/save/PHxx_yyyyy/    for UX 11.X
```

When you remove a patch (`swremove`) these files will be restored to their original locations. They are called *patch rollbacks*.

To avoid the original files from being backed up (which is a little bit risky) you have to do the following:

for 10.X

```
create a dummy file PATCH_NOSAVE before swinstall:
# touch /var/adm/sw/PATCH_NOSAVE
```

for 11.X

```
use a special swinstall option:
# swinstall -x patch_save_files=false
```

To delete existing patch rollbacks in order to save disk space you can use the [cleanup\(1M\)](#) command:

for 10.X

```
# cleanup -F
```

for 11.X

To remove (commit) patches that have been superseded at least two times do:

```
# cleanup -c 2
### Cleanup program started at 02/20/02 13:15:43
Commit patches superseded at least 2 time(s) on 'grcdg319'.
Obtaining superseded patch information...done.
```

The following patches superseded at least 2 time(s) can be committed:

Superseded	# Times Superseded	Disk Space in /var/adm/sw/save	Superseded By
=====	=====	=====	=====
PHCO_23427	2	23646208 bytes	PHCO_24400
PHCO_23772	3	23476224 bytes	PHCO_23427
PHKL_23313	2	66560 bytes	PHKL_25165
PHKL_23445	2	133120 bytes	PHKL_24566
PHKL_23609	2	229376 bytes	PHKL_24550
PHKL_23642	2	131072 bytes	PHKL_24046

```
WARNING: When a patch is committed, the files saved to /var/adm/sw/save
during the installation of the patch are removed. If
these saved files are not present, then the patch cannot
be removed from the system via swremove(1M).
```

If these files in /var/adm/sw/save must be removed, HP recommends that the /var/adm/sw/save directory first be backed up. If it should become necessary to remove the patch in the future, the files must be recovered from the backup prior to removing the patch.

If you have not already created a backup of /var/adm/sw/save, you may wish to do so before proceeding with the patch commit operation.

```
Would you still like to commit these patches? y
Committing patches superseded at least 2 time(s) ...done.
All information has been logged to /var/adm/cleanup.log.
### Cleanup program completed at 02/20/02 13:15:43
```

NOTE: cleanup is just a frontend to swmodify:

```
# cleanup -c 1

would do the same as

# swmodify -x patch_commit=true *\.*
```

Patch Tools: show_patches, check_patches and cleanup

These useful tools are not delivered with HP-UX core, but as a patch:

PHCO_20824 (or newer)	for UX 10.20 (cleanup command only)
PHCO_24347 (or newer)	for UX 11.00
PHCO_24630 (or newer)	for UX 11.11

show_patches Command

The show_patches utility displays active and superseded patches in a formatted output, which may be easier to interpret than the output of the swlist command. The utility uses the SD-UX patch attributes patch_state and superseded_by to determine which patches are active and which are superseded.

To display only the active (non superseded) patches do

```
# show_patches

Active Patch Description
-----
PHCO_22958 set_parms
PHCO_22989 Som2elf Patch
PHCO_23004 cumulative SAM/ObAM patch
PHCO_23083 newgrp(1) patch
PHCO_23150 HP Array Manager/60 cumulative patch
```

Refer to the show_patches manual page for details.

check_patches Command

The check_patches script does a general sanity check on the whole patch database. It checks for patches missing the SD-UX patch attributes, missing patch filesets, patch object modules

missing from archive libraries, patch filesets with the incorrect patch_state, patch filesets not in the configured state, and patch filesets that fail `swverify(1M)`.

The `check_patches` utility logs all information to `/tmp/check_patches.report`.

Invoke `check_patches` with no options to perform all checks.

```
# check_patches
Obtaining information on installed patches
Checking for invalid patches
Checking for ar(1) patches
Checking object module checksums for active patch fileset 309 of 309
Checking patch filesets for active patch 156 of 156
Checking state for patch fileset 573 of 573
Checking patch_state for patch fileset 573 of 573
Running swverify on all patch filesets, this may take several minutes
RESULT: Problems found, review /tmp/check_patches.report for details.
```

Refer to the `check_patches` manual page for details.

cleanup Command

The `cleanup` utility is used ...

- to remove any patches for earlier releases from the Installed Product Database (IPD) after updating to a newer version of HP-UX.
- to commit patches across the entire system, i.e to remove [patch rollbacks](#).
- to remove patches from a software depot if they have been superseded by patches also available in the same depot.

`cleanup` logs all information to `/var/adm/cleanup.log`.

Refer to the `cleanup` manual page for details.

Standard Patch Bundles - Support Plus

the **standard patch bundles** are included in the *Support Plus Pack*. It replaces the Extension Software (XSW) and Independent Product Release (IPR) products.

HP-UX Support Plus contains:

- **Quality Pack (QPK) bundles** which include all stable defect-fix patches for core HP-UX, graphics, and key networking drivers.
- **Hardware Enablement (HWE) bundles** which provide patches required for new systems and for add-on hardware supported on HP-UX 11.00 and HP-UX 11i OE. The HWE bundles also provide patches that support the latest boot devices and I/O adapters with the Ignite-UX tools.
- **General Release (GR) bundles** which provide 10.20 general release patches. These

bundles are a tested set of HP-UX core patches.

- **Hardware/Critical (HWCR) bundle** which delivers hardware enablement and critical patches for your HP-UX 10.20 server. Hardware enablement patches are required to update existing systems and new devices while the critical patches fix problems that could cause data loss or corruption.
- **Diagnostics**, including Support Tool Manager (STM) for online diagnostics, ODE (off-line diagnostics), EMS hardware monitors, Predictive Support, EMS Kernel Resource Monitor, and the Instant Capacity on Demand (iCOD) client products.

You download Support Plus directly from the ITRC web site (<http://itrc.hp.com/common/bin/doc.pl/screen=commonExtensionSW>) or install it from the quarterly media shipped to you if your HP-UX support contract is current. The following HP internal site additionally lists all the former Support Plus releases as of Sep.99: <http://patchsvr.fc.hp.com/bundles/release/> (HP internal)

Here's an overview of the currently available patch bundles that are included in Support Plus:

UX 10.20

700QPK1020	Workstation Quality Pack for HP-UX 10.20 (Sep 00)
XSW700GR1020	General Release Patches for HP-UX 10.20 Workstations
XSW800GR1020	General Release Patches for HP-UX 10.20 Servers
XSW700HW1020	Hardware Enablement Patches for HP-UX 10.20 Workstations
XSW800HWCR1020	Hardware Enablement and Critical Patches for HP-UX 10.20 Servers

UX 11.00

QPK1100	Quality Pack for HP-UX 11.00
HWE1100	Hardware Enablement Patches for HP-UX 11.00

UX 11.11

GOLDQPK11i contains	
GOLDBASE11i	Gold Base Patches for HP-UX 11i
GOLDAPPS11i	Gold Applications Patches for HP-UX 11i
HWenable11i	Hardware Enablement Patches for HP-UX 11i

UX 11.22 (Itanium release)

MAINTPACK	Collection of defect-fix patches
-----------	----------------------------------

What is a „Line in the Sand” Patch?

A line in the sand patch is a kernel patch (PHKL) that combines many kernel fixes at once. The intention is to have a base patch that puts the OS to a certain level. A line in the sand patch will never be succeeded by another patch and there will only be one line in the sand patch for each HP-UX release. HP asked all customers to install this patch so you should not find any system without this patch.

Up to the present there are three of such patches:

[PHKL_18543](#) UX 11.00 - s700_s800
[PHKL_16751](#) UX 10.20 - s800
[PHKL_16750](#) UX 10.20 - s700

Of course the object files, that are fixed with such a patch are subjected to change over time. There are many newer patches that overwrite parts of it. This is not a problem as long as you avoid reinstalling it. And this is exactly what happened lots of times in the past. Reinstalling a line in the sand patch is not permitted since it puts the OS into a corrupted state resulting in problems during kernel generation (see [Kernel Chapter](#) for an example).

There [check_patches](#) utility (see above) allows you to check for all overwritten files on the system and detect if a line in the sand patch had been reinstalled.

If this is the case the safest way to repair it is to reinstall ALL kernel patches (PHKL) that are shown by `swlist` (minus the line in the sand patch itself).

I recommend to feed the PatchWork utility (see section [Patch Utilities](#) below) with the output of

```
swlist -l product | grep PHKL
```

Now run “update & dependency check”. Create a patch bundle that contains all the resulting patches minus the line in the sand patch. Install the bundle using `swinstall` options `reinstall=TRUE` and `reinstall_files=TRUE`.

see KMINE document [KBRC00006852](#) for more details.

Patch Utilities on the Intranet

- **Patch Catalog**

<http://wtec.cup.hp.com/~patches/catalog/> (HP internal)

This tool allows you to browse the HP-UX patch database, search for patches by keywords display the patch text, dependencies, successors, etc..

- **Find patch by file**

<http://wtec.cup.hp.com/~patches/forms/patchfile.html> (HP internal)

Accepts files or objects as input and searches for the latest patch(es) that modified it.

- **Find patch by kernel symbol**

<http://dumpy.grc.hp.com/kernelsym.html> (HP internal)

Accepts a kernel symbol as input and searches for patches containing it.

- **PatchWork**

<http://www.grc.hp.com/cgi-bin/wwwcast/PatchWork7/PatchWork.pl> (HP internal)

This tool parses through a list of patches allowing to update and resolve dependencies.

There are interfaces to the *Patch Depot Manager* and *Patch Minisets*.

- **Patch Minisets**

http://hprtnt06.grc.hp.com/mcux/Patches/miniset_index.html (HP internal)

There was a need for relatively small patch bundles (minisets) that affect certain applications or subsystems. On this website you can find minisets like: Mass Storage, MC/ServiceGuard, Omniback, etc.

- **Patch Depot Manager (PDM)**

<http://police.grc.hp.com:81/> (HP internal)

This tool accepts a list of patches as input and generates a SD-UX bundle on the local patch server police. This patch bundle can be copied to any ftp server optionally.

NOTE: Only engineers in Ratingen (Germany) are allowed to use this tool.

- **Web Patches**

<http://police.grc.hp.com:84/> (HP internal)

This tool accepts a list of patches as input. These patches are copied to a DDS tape or CD-ROM by labeled and send to the specified address.

NOTE: Only engineers in Ratingen (Germany) are allowed to use this tool.

- **other Patch tools offered by WTEC**

<http://wtec.cup.hp.com/~patches/tools/default.shtml> (HP internal)

A collection of more or less useful tools.

Additional Information

Valuable information about what changed from 10.X to 11.X patching can be found in the "*HP-UX 11.X Patch Program White Paper*" in the file `/usr/share/doc/patch_pgrm.txt` on any UX 11.00 system.

Related manual pages are:

`sd(1M)`, `swinstall(1M)`, `swcopy(1M)`, `sw...`,
`show_patches(1)`, `check_patches(1M)`, `remove_patches(1M)`, `cleanup(1M)`.

Patch Management documents:

<http://docs.hp.com/hpux/os/10.x/index.html#Patch%20Management>

<http://docs.hp.com/hpux/os/11.0/index.html#Patch%20Management>

The *HP-UX patch equivalency table* helps to find out if a patched defect on your system has been addressed in the newer OS:

<http://support1.itrc.hp.com/service/patch/patchEquivPage.do>