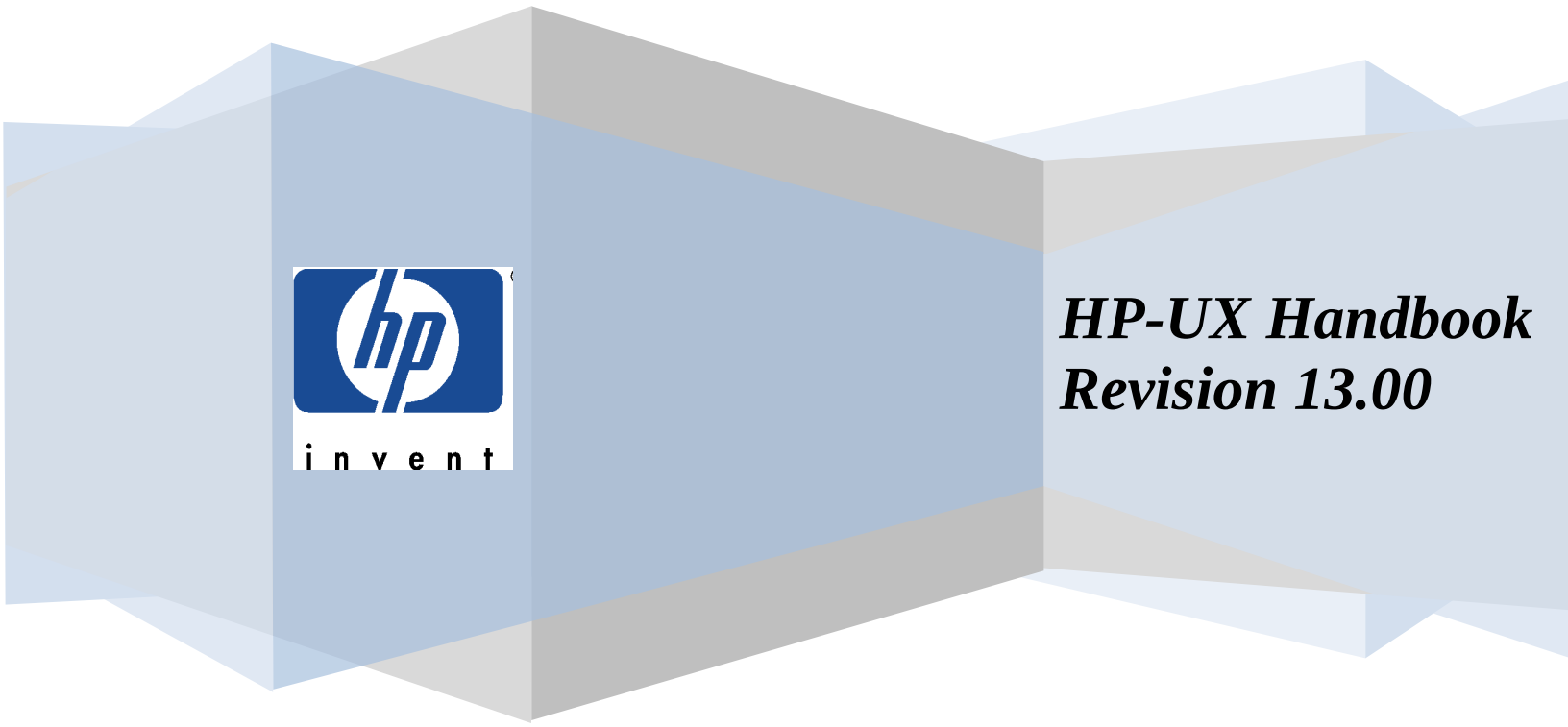
Chapter 05

Software Distributor (SD-UX)



HP-UX Handbook
Revision 13.00

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Introduction

This chapter provides an overview of Software Distributor for HP-UX 11i (SD-UX) commands and concepts.

SD-UX is included with the HP-UX Operating System and by default manages software on the local host only. You can also enable SD-UX to install and manage software simultaneously on multiple remote hosts from a central controller. This chapter does not present a comprehensive view of SD-UX. For in-depth information, consult the below SD-UX manuals:

Software Distributor Administration Guide HP-UX 11i v1, 11i v2, and 11i v3 (Sept 2011)

Patch Management User Guide for HP-UX 11.x Systems (Sept 2011)

Patches for SD-UX

The current SD-UX Patches are:

UX 11.11 PHCO_41200 (or newer)
UX 11.23 PHCO_41201 (or newer)
UX 11.31 PHCO_41202 (or newer)

The Basic SD-UX Object Types

Software Distributor uses a variety of object types. This section gives you a simplified view of the object types. You can find formal definitions in the "Software Distributor Administration Guide HP-UX 11i v1, 11i v2, and 11i v3" or the sd(4) man pages.

Fileset

A fileset is one or more related files, grouped into a manageable unit. It describes a unique subset of the files that make up a product. A fileset may include scripts that control installation and removal. In general, patches are created and managed at the product level, and patch filesets are delivered only within a patch product. Therefore, you should avoid selecting patches at the fileset level, even though SD-UX permits this kind of selection. Selecting patches by fileset level may cause a fix to be only partially applied.

Product

An HP-UX patch is structured as a single SD-UX product that contains one or more filesets. HP-UX 11.X patches that require customization include SD-UX control scripts at the product level.

Bundle

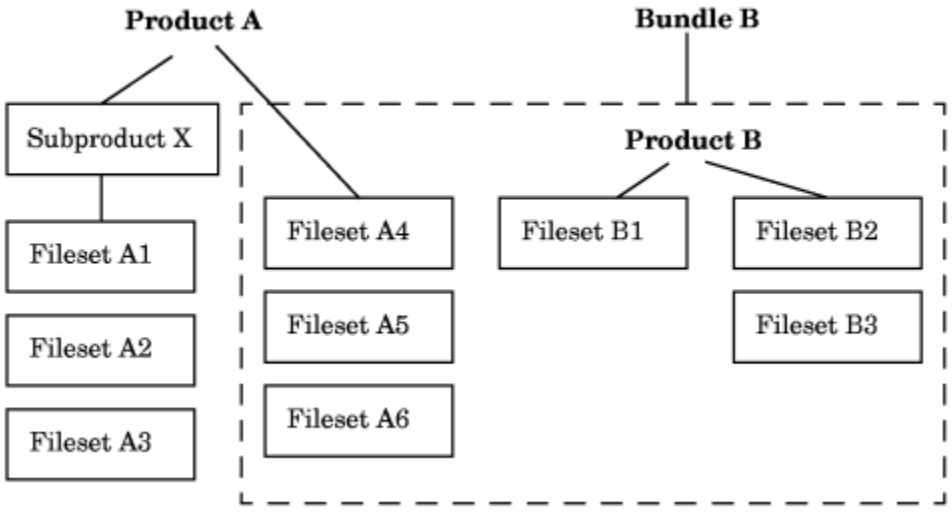
A bundle encapsulates products and filesets into a single software object. Bundles provide a convenient way to group software objects together for easy selection. More than one bundle can contain the same software objects. A bundle can be thought of as a virtual "configuration" of software. HP provides several types of standard patch bundles.

Depot

A depot is a directory that contains software products or bundles that are available for direct or remote installation. You can change the contents of a depot. A depot can also be a distribution media (e.g., CD or tape) or a single, serial file that contains products or bundles.

Software Specifications

When an SD-UX command is applied to a software selection, the selection is comprised of one or more software specifications. A software specification is a unique identifier for an SD-UX software object. A software specification must name either a product or a bundle, and filesets can be specified only within a product. If you explicitly select a bundle, all products within the bundle are also selected. If you select a product, all filesets within that product are also selected.



Example of HP-UX Software Structure

For patch operations, you usually only need to refer to a patch or bundle name.

The software specification takes one of the following formats:

```
product[.fileset][, version]
bundle[.product[.fileset]][, version]
```

where the version has the form:

```
[r= revision][,a= arch][,v= vendor][,c= category]
```

(The version may also have a `l=` locationcomponent that applies only to installed software and refers to software installed to a location other than the default product directory.)

The `software_spec` attribute contains the full software specification for any bundle, product, or patch. You can use the `swlist` command to display this information. The following example shows how `swlist` can create a list of the software specifications for a patch at the fileset level. The software specification for the patch product appears in the output as a comment.

```
# swlist -l fileset -a software_spec PHKL_18543
# PHKL_18543 PHKL_18543,l=/,r=1.0,a=HP-UX_B.11.00_32/64,v=HP
PHKL_18543.C-INC PHKL_18543.C-INC,l=/,r=1.0,a=HP-UX_B.11.00_32/64,v=HP,fa=HP-UX_B.11.00_32/64
PHKL_18543.CORE-KRN PHKL_18543.CORE-KRN,l=/,r=1.0,a=HP-UX_B.11.00_32/64,v=HP,fa=HP-
UX_B.11.00_32/64
PHKL_18543.CORE2-KRN PHKL_18543.CORE2-KRN,l=/,r=1.0,a=HP-UX_B.11.00_32/64,v=HP,fa=HP-
UX_B.11.00_32
PHKL_18543.KERN2-RUN PHKL_18543.KERN2-RUN,l=/,r=1.0,a=HP-UX_B.11.00_32/64,v=HP,fa=HP-
UX_B.11.00_32
PHKL_18543.VXFS-ADV-KRN PHKL_18543.VXFS-ADV-KRN,l=/,r=1.0,a=HP-UX_B.11.00_32/64,v=HP,fa=HP-
UX_B.11.00_32
PHKL_18543.VXFS-BASE-KRN PHKL_18543.VXFS-BASE-KRN,l=/,r=1.0,a=HP-UX_B.11.00_32/64,v=HP,fa=HP-
UX_B.11.00_32
PHKL_18543.VXFS-PRG PHKL_18543.VXFS-PRG,l=/,r=1.0,a=HP-UX_B.11.00_32/64,v=HP,fa=HP-
UX_B.11.00_32/64
```

The IPD – Installed Product Database

An SD "catalog" is a database of information about software. For example, a depot is a "catalog" plus the set of files described by the catalog. The *IPD (Installed Product Database)* is a specific instance of an SD catalog found at `/var/adm/sw/products`. This database (or catalog) does not contain the software itself. It only contains the meta data, i.e. data about SD objects. The kind of data kept in the catalog are all the object attributes (i.e. "revision=1.2"), all the control scripts (preinstall, postremoved, ...), swask response files, permission (swacl) files, etc.

IPD File listing

The IPD is not a single file but a hierarchy of files located in `/var/adm/sw/products`. In the top

IPD directory, each bundle and product gets its own directory.

```
# ll /var/adm/sw/products
total 6648
dr-x------  473 root       sys          11264 Apr  9 12:24 ./
drwxr-xr-x  13 bin        bin           1024 Apr  9 16:08 ../
drwxr-xr-x   7 root       sys           1024 Apr 25  2002 Accounting/
drwxr-xr-x   5 root       sys             96 Apr 25  2002 ApacheStrong/
drwxr-xr-x  11 root       sys           1024 Apr 25  2002 Asian-Core/
...
-rw-r--r--  1 root      sys       1960447 Apr  4 10:34 INDEX
```

Underneath those directories for all products and bundles one will find the control directories. Control directories have names like "`?files`". For example "`ifiles`" which is the IPD control directory, "`pfiles`" which are bundle and product control directories and "`dfiles`" which are depot control directories. Control directories contain control information for the object they refer to. Here is the type of information that is saved and what file it is contained in:

File	Control Information
INDEX	Bundle, product, subproduct, fileset and IPD attributes (revision, architecture, is_patch, …). These are the fragment INDEX files from which the master INDEX file gets created.
INFO	File attributes (path, cksum, mode, …)
file	Files referred to by an attribute. For example, "readme README". The file README is saved in the control directory.
control scripts	preinstall, postinstall, configure, …
response file	swask response files are saved in the control directory.
_ACL	root ACL file (in IPD control dir only)
_OWNER	root owner file (in IPD control dir only)

Master Index

The master index is a single file – `/var/adm/sw/products/INDEX` – containing all the attribute-value pairs from each control directory INDEX file. Frequently, if the master INDEX is corrupted, it may be rebuilt by concatenating all the good fragment INDEX's, see rebuild the Master INDEX file..

Session Files

Session files let you save your work from a command session. Each invocation of an SD-UX command defines a session. The invocation options, source information, software selections, and target hosts are saved before command execution actually commences. This lets you re- execute the command even if the session ends before proper completion. Each session is saved to the file

`$HOME/.sw/sessions/{ command}.last`. This file is overwritten on each invocation.

You can also save session information from interactive or command-line sessions. From an interactive session, you can save session information into a file at any time by selecting the **Save Session** or **Save Session As** option from the **File** menu. From a command-line session, save session information by executing swinstall or swcopy with the `-C session_file` option.

A session file uses the same syntax as the defaults files. You can specify an absolute path for a session file. If you do not specify a directory, the default location for a session file is `$HOME/.sw/sessions/`.

To re-execute a saved session from an interactive session, use the **Recall Session** option from the **File** menu. To re-execute a session from a command-line, specify the session file as the argument for the `-S session_file` option of `swinstall` or `swcopy`.

Note that when you re-execute a session file, the values in the session file take precedence over values in the system defaults file. Likewise, any command line options or parameters that you specify when you invoke `swinstall` or `swcopy` take precedence over the values in the session file.

NOTE: Use of session files is not recommended with `swremove` because the session file could include software selections that you do not want included in the removal operation.

Setting Default Values for Command Options

SD-UX commands have extensive options that alter command behavior. The `/usr/lib/sw/sys.defaults` file is a template that lists and explains each option, default values, all other allowable values, and the resulting system behavior for each. These options are listed as comments that you can copy into the system defaults file (`/var/adm/sw/defaults`) or your personal defaults file (`$HOME/.sw.defaults`).

Values in these option files are specified using this syntax:

```
[command.]option=value
```

These rules govern the way the defaults work:

1. Option values in `/usr/lib/sw/sys.defaults` is only usable as a template for copying to other option files.
2. Option values in `/var/adm/sw/defaults` file affect all users in a system.
3. Option values in your personal `$HOME/.sw.defaults` file affect only you and not the entire system.

4. Option values in a session file affect activities only for that session and revert when that session is completed.
5. Option values changed on the command line affect only that activity.

For system-wide policy setting, use the `/var/adm/sw/defaults` file. Keep in mind, however, that individual users may override these values with their own `$HOME/.sw.defaults` file, session files, or command line changes.

These values can also be overridden by specifying an options file with the `-X option_file` command-line option or with one or more `-x option=value` options directly on the command line. They can also be changed using the GUI Options Editor.

Altering option values and storing them in a defaults file can help when you want the SD-UX command to behave the same way each time the command is invoked. Options in the defaults file are read as part of command initialization. Because the daemon is already running, after changing daemon options, the daemon must be restarted for these options to be recognized. To restart the daemon, type:

```
/usr/sbin/swagentd -r
```

SD-UX Commands

The following section discusses the most commonly used SD-UX commands:

- `swinstall` installs and configures software products.
- `swcopy` copies software products for subsequent installation or distribution.
- `swremove` unconfigures and removes software products.
- `swlist` displays information about software products.
- `swreg` registers or unregisters depots or roots.
- `swmodify` modifies software product information in a target root or depot.
- `swpackage` packages software products into a depot (directory or tape).
- `swverify` verifies available (copied), installed, or configured software products.
- `swconfig` configure, unconfigure and reconfigure software products.
- `cleanup` removes patch rollbacks.
- `show_patches` displays patches.

All SD-UX commands run from the command line. `swinstall`, `swcopy`, `swremove`, and `swlist` have an optional GUI mode.

swinstall Command

The `swinstall` command is used to load software from a source depot and onto a target system.

- Because many patches aren't designed for individual installation, the automatic matching options(`autoselect_patches`, `patch_match_target`) should be the preferred method for installing patches.
- `swinstall` has numerous options that you should not use for patching because they lack dependency support. HP recommends that you use only the options discussed below.

Synopsis

```
swinstall [-i] [-p] [-v] [-s source] [-x option=value]...
      [s/w_selections]
```

Command Line Arguments	
`-i`	Use an interactive user interface. If the environment variable DISPLAY is set to a valid X windows display, a graphical user interface is invoked. Otherwise a terminal user interface (TUI) designed for use on ASCII terminals is invoked. The GUI starts by default if you enter `swinstall` without any `s/w_selections`.
`-p`	Previews the install operation without performing the actual installation. Preview mode is *not* enabled by default.
`-v`	Requests verbose mode. This option affects only standard output and not the log files.
`-s source`	Specifies the depot (`source`) containing the software to be installed.
`-x option=value`	Sets the specified command option to the value given, overriding any other values for that option. Patch related command options are specified below.
`s/w_selections`	One or more software specifications.

The following options have the most relevance to patching. Where appropriate, default values are shown. For the full set of available options, consult the `swinstall(1m)` man pages or the " Software Distributor Administration Guide HP-UX 11i v1, 11i v2, and 11i v3 (Sept 2011)".

swinstall Command Options and Default Values
- max_targets=25
- mount_all_filesystems=true
- os_name
- os_release
- patch_filter=software_specification
- patch_match_target=false
- patch_save_files=true
- polling_interval=2
- preview=false

recopy=false
register_new_root=true
reinstall=false
reinstall_files=false
reinstall_files_use_cksum=true
retry_rpc=1
retry_rpc_interval=
reuse_short_job_numbers=true
rpc_binding_info=ncacn_ip_tcp:[2121]
ncadg_ip_udp:[2121]
rpc_binding_info_source=
rpc_binding_info_target=
rpc_timeout=5
run_as_superuser=true
run_scripts=true
select_local=true
software=
software_view=all_bundles
source=
source_cdrom=/SD_CDROM
source_directory=
source_tape=/dev/rmt/0m
source_type=directory
targets=
use_alternate_source=false
verbose=1
write_remote_files=true
admin_directory=/var/adm/sw
agent_auto_exit=true
agent_timeout_minutes=10000
allow_downdate=false
allow_incompatible=false
allow_multiple_versions=false
allow_split_patches=false
ask=false
autoreboot=false
autorecover_product=false
autoremove_job=false
autoselect_dependencies=true
autoselect_minimum_dependencies=false
autoselect_patches=true
autoselect_reference_bundles=true
codeword=
compress_index=false
controller_source=

create_target_path=true
customer_id=
defer_configure=false
distribution_source_directory=/var/spool/sw
enforce_dependencies=true
enforce_dsa=true
enforce_kernbld_failure=true
enforce_scripts=true
enforce_selections=false
installed_software_catalog=products
job_title=
layout_version=1.0
loadorder_use_coreqs=true
log_msgid=0
logdetail=false
logfile=/var/adm/sw/swinstall.log
loglevel=1
lookupcache_timeout_minutes=10
match_target=false

Examples

Install from a CD mounted and registered on the system grendel:

```
swinstall -s grendel:/cdrom/QPK1100 \
      -x patch_match_target=true -x autoreboot=true
```

Use the `swinstall` command's preview mode (`-p` option) to get an idea of what to expect for the bundle you want to install. For example:

```
swinstall -p -s grendel:/cdrom/QPK1100 \
      -x patch_match_target=true
      -x autoreboot=true
```

Install of product A1234AA from registered depot `/var/spool/sw` on the system grendel:

```
swinstall -s grendel:/var/spool/sw A1234AA
```

swcopy Command

The `swcopy` command copies software from one depot to another. This can be particularly useful if software exists in several depots. For example, you can copy all of the contents of individual patches into a single depot from which the group can be loaded in a single session and with a single reboot (if needed).

Note that the `swcopy` command automatically registers (enables remote access to) any depot that it creates. You do not need to use the `swreg` command on depots created by `swcopy`.

Synopsis

swcopy [XToolkit Options] [-i] [-p] [-v] [-C session_file] [-f software_file] [-J jobid] [-Q date] [-s source] [-S session_file] [-t target_file] [-x option=value] [-X option_file] [software_selections] [@ target_selections]

Command Line Arguments	
`-i`	Use an interactive user interface. If the environment variable DISPLAY is set to a valid X windows display, a graphical user interface is invoked. Otherwise a terminal user interface (TUI) designed for use on ASCII terminals is invoked. The GUI starts by default if you enter `swcopy` without any `s/w_selections`.
`-p`	Previews the install operation without performing the actual copy. Preview mode is *not* enabled by default.
`-v`	Requests verbose mode. This option affects only standard output and not the log files.
`-s source`	Specifies the depot (`source`) containing the software to be copied.
`-x option=value`	Sets the specified command option to the value given, overriding any other values for that option. Patch related command options are specified below.
`s/w_selections`	One or more software specifications.
`target_selections`	The absolute path name (directory location) to which you want the `s/w_selections` to be copied. If you specify a host with the directory, the syntax is `host:/directory` where the host name can be a name, domain name, or internet address.

The following options have the most relevance to patching. Where appropriate, default values are shown. For the full set of available options, consult the `swcopy(1m)` man page or refer to the " Software Distributor Administration Guide HP-UX 11i v1, 11i v2, and 11i v3 (Sept 2011)".

Options	
`option=default value` Description	Menu Path in Interactive Interface
`autoselect_dependencies=true`	**Actions→Mark for Install** (when marking software)
When software is selected for copying with a registered dependency on other software, other software will automatically be selected to be copied if present in the source depot and `autoselect_dependencies` is set to `true`.	
`autoselect_reference_bundles=true`	None (default cannot be changed within GUI)
When set to true, any bundle wrappers within the source depot that contain software selected for installation will be automatically selected if the `is_reference` attribute is set to true. Note that this does not mean all of the software listed in the wrapper will be selected, only the bundle wrapper itself.	

`compress_files=false`	**Options→Change Options→Compress files during transfer**
Setting this option to true causes `swcopy` to compress file before transfer to the target depot. This will conserve disk space and can enhance performance on slower networks (50 Kilobytes/second or less), although it may not improve fast networks.	
`enforce_dependencies=true`	**Options→Change Options→Enforce dependency analysis errors in agent**
Enforces software dependencies. When software to be copied has an SD-UX-enforced dependency, if that dependency is not present on the target system and is not marked for copying from the source depot the copy will only proceed if `enforce_dependencies` is set to false. While few 11.00 patches currently exist with dependencies enforced by the SD-UX tools, those that do employ them to enforce critical requirements of content and load order. The majority of 11i patches have SD-UX-enforced dependencies, making this option very useful. This option should not be set to false unless directed by an HP Support Engineer.	
`mount_all_filesystems=true`	**Options→Change Options→Mount filesystems in /etc/fstab or /etc/checklist**
By default, `swcopy` requires that all filesystems listed in the systems `/etc/fstab` file are mounted prior to installation. Setting this option to false removes this restriction.	
`reinstall=false`	**Options→Change Options→ Recopy filesets even if the same revision exists**
Prevents SD-UX from overwriting an existing revision of a fileset. If set to true, filesets will be recopied.	
`source_tape=/dev/rmt/0m`	None (default cannot be changed within GUI)
Specify the device file of the tape drive to be used as the default.	
`uncompress_files=false`	**Options→Change Options→Uncompress files after transfer**
When set to true, files are uncompressed before `swcopy` puts them into the target depot. See also the `compress_files` option.	
`write_remote_files=false`	None
Prevents copying of files to a target that exists on a remote (NFS) file system. By default, `swcopy` skips files that would be copied to an NFS file system (or that are already there). When set to true and superuser has write permission on the remote file system, files are copied to remote systems.	

Examples

With the CD mounted at `/cdrom`, copy the contents of the QPK1100 depot to the local system under the `/var/tmp/MyDepot` directory.

```
swcopy -s /cdrom/QPK1100 \* @ /var/tmp/MyDepot
```

Invoke an interactive session, using the default depot at hostX as the source:

```
swcopy -i -s hostX
```

Copy all patches in current directory to the depot `/hub/patches` (assuming root shell is `/sbin/sh`):

```
for PATCHDEPOT in *.depot
```

```
do
swcopy -s $PATCHDEPOT \* @ /hub/patches
done
```

swremove Command

The swremove command deletes software that has been installed on your system. It also removes software from depots.

You might occasionally want to remove a patch and restore the system to its prepatched state. This process is known as patch rollback. For example, if you installed a patch that resulted in unacceptable system behavior, you might choose to roll back this patch. However, rollback is possible only if certain files were saved as part of the patch installation process. During patch installation, the default behavior is to save copies of all files that are replaced by the new patch before the new versions of these files are loaded. These saved files are called rollback files and are the key to making patch rollback possible. When you roll back a patch, these rollback files are restored to the system. You should override the default behavior only if you have a complete understanding of the patch rollback process.

You cannot roll back a patch unless one of the following is true:

• Rollback files corresponding to the patch are available for reinstallation.

• Base software and the patch that modifies the software are removed at the same time (removing the base software also removes the patches associated with that software).

• For superseded patches, you must first roll back the superseding patch.

You can use the swremove command to roll back a patch (if no dependencies exist for the patch). Use the following command to roll back the patch patch_id:

swremove patch_id

As is true for many SD-UX commands, you can add the -p option to execute the command in preview-only mode. This mode allows you to view output from the command without actual changes occurring. You should initially execute the command in preview mode:

swremove -p patch_id

Advanced topic: patch installation and rollback files When installing patches, you can explicitly specify that rollback files not be saved. To do this,
you add the -x patch_save_files=false option to the swinstall command:

```
$ swinstall -s /tmp/temporary_depot/depot -x autoreboot=true \
-x patch_match_target=true x patch_save_files=false
```

Only use the false option if you will never remove a patch under any circumstances

Synopsis

swremove [XToolkit Options] [-d|-r] [-i] [-p] [-v] [-C session_file] [-f software_file] [-J jobid] [-Q date] [-S session_file] [-t target_file] [-x option=value] [-X option_file] [software_selections] [@ target_selections]

Command Line Arguments	
`-i`	Use an interactive user interface. If the environment variable DISPLAY is set to a valid X windows display, a graphical user interface is invoked. Otherwise a terminal user interface (TUI) designed for use on ASCII terminals is invoked. The GUI starts by default if you enter `swremove` without any `software_selections`.
`-d`	Operate on a depot rather than installed software.
`-p`	Previews the remove operation without performing the actual removal. Preview mode is not enabled by default.
`-v`	Requests verbose mode. This option affects only standard output and not the logfiles. Verbose mode is enabled by default.
`-x option=value`	Sets the specified command option to the value given, overriding any other values for that option. Patch related command options are specified below.
`s/w_selections`	One or more software specifications.
`target`	The depot from which software is to be removed. If not specified, the target is assumed to be the system itself.

The following options have the most relevancy to patching. Where appropriate, default values are shown. For the full set of available options, consult the `swremove(1m)` man page or refer to the Software Distributor Administration Guide HP-UX 11i v1, 11i v2, and 11i v3.

Options	
`option=default value` Description	Menu Path in Interactive Interface
`autoselect_reference_bundles=true`	None
If true, bundles that have the `is_reference` attribute set to true will be automatically removed when the last of its contents is removed. If false, the bundles will not be automatically removed.	
`enforce_dependencies=true`	**Options→Change Options→Enforce dependency analysis errors in agent**

Enforces software dependencies. When software selected for removal has a registered dependency, if the dependencyis not present on the target system or also selected for removal from the source depot, removal only proceeds if `enforce_dependencies` is set to false. While few 11.00 patches currently exist with dependencies enforced by the SD-UX tools, those that do employ them to enforce critical requirements of content and removal order. However, since all 11i patches enforce depen-dencies, this option is very useful in maintaining patch integrity and system stability. Do not set this option to false unless directed to do so by an HP Support Engineer.	
`enforce_scripts=true`	**Options→Change Options→Enforce script failures**
Each patch may have several removal scripts associated with it. These scripts may issue errors to protect the system from incorrect patch usage. This option should not be used unless directed by an HP Support Engineer.	
`mount_all_filesystems=true`	**Options→Change Options→Mount filesystems in /etc/fstab or /etc/checklist**
By default, SD-UX requires that all filesystems listed in the systems `/etc/fstab` file are mounted prior to removal. Setting this option to false removes this restriction.	
`write_remote_files=false`	None (default cannot be changed within GUI)
Prevents removal of files from a target that exists on a remote (NFS) file system. By default, swremove skips files that would be removed from an NFS file system. When set to true and superuser has write permission on the remote file system, files are removed from remote systems.	

Examples

Remove only the bundle wrapper XSWHWCR11.11 from the system, leaving any contents present (Note that the trailing period (.) is essential to removing the wrapper only):

```
swremove XSWHWCR1100.
```

Remove all contents of the depot, `/depots/MyDepot`:

```
swremove -d \* @ /depots/MyDepot
```

swlist Command

The `swlist` command provides information on software installed on a system or located in a depot. More specifically:

- See what's installed on a system.
- See what software is in a depot.
- Check attributes of software.
- Browse the patch documentation.
- See what depots are available on remote systems.

Synopsis

swlist [-d|-r] [-i] [-R] [-v] [-a attribute] [-C session_file] [-f software_file] [-l level]
[-s source] [-S session_file] [-t target_file] [-x option=value] [-X option_file]

[software_selections] [@ target_selections]

Command Line Arguments	
`-i`	Invokes a GUI interface that lets you perform interactive software selections. If the environment variable DISPLAY is set to a valid X windows display, a graphical user interface is invoked. Otherwise a terminal user interface (TUI) designed for use on ASCII terminals is invoked. You *must* specify -i to invoke the GUI; it never starts by default.
`-d`	Lists software depots instead of software currently installed on the target system.
`-v`	If no `-a` options are specified, then list all the attributes for an object, one attribute per line. The attributes are listed in the format: `keyword value` If one or more `-a` options are specified, then list the selected attributes in the above format.
`-a attribute`	The named attribute is included in the listing when defined at the specified level. While this option may be specified multiple times, the ordering of the arguments does not control the format of the list.
`-s source`	Specifies the software source to list. This is an alternative way to list a source depot. You can also specify the sources as target depots and list them using the `-d` option.
`s/w_selections`	One or more software specifications.
`target`	The depot to be listed. If not specified, the target is assumed to be the system itself.
`-l level`	Specifies the detail of the `swlist` output. The values used include: • `file` List all files recorded in the IPD. The listing may be limited in scope by the `s/w_selections` specification. Each file is preceded by the product and fileset that is the registered owner of that file. A comment (marked by a leading # character) precedes each block giving the name, revision, and description of the product or fileset to be listed. • `fileset` List all filesets recorded in the IPD (in `product.fileset` format) with the associated revision and description. A comment (marked by a leading # character) precedes each block giving the name, revision, and description of the product. • `product` List all products with revision and description for each. • `bundle` List all bundles with revision and description for each. • `depot` List all registered depots on the target system. • `patch` List all patch filesets using the full software specification, followed by the associated description and current `patch_state`. The listing is sorted by ancestor, and all products and filesets are listed as a comment showing revision and description before any patch fileset that apply to it. • `category` List all category tags currently defined within the target depot. • *default* (no level specified) When no level is specified, `swlist` displays all bundles within the depot followed by any products not contained within a bundle. As is the case with their respective levels, the bundles and products are listed with revision and one-line description.

The following options have the most relevancy to patching. Where appropriate, default values are shown. For the full set of available options, consult the `swlist(1m)` man page or refer to the Software Distributor Administration Guide HP-UX 11i v1, 11i v2, and 11i v3.

Options	
`option=default value`	Menu Path in Interactive Interface
Description	
`show_superseded_patches=false`	
The swlist command lists the contents of the IPD. In 11.00 systems, swlist lists all patches in the IPD, whether or not they are superseded. In 11i, swlist only lists those patches which are active on the system. By setting this option to true the 11.00 swlist functionality can be turned on in an 11i system (all patches in the IPD are listed). However, to get the 11i functionality on an 11.00 system, patch PHCO_22526 must be installed and `swlist.show_superseded_patches=false` must be added to the `/var/adm/sw/defaults` file.	

Examples

List all products with revision and description for each:

```
swlist -l product | more
```

List all filesets which have a state other than configured:

```
swlist -l fileset -a state | grep -v -e '^#' -e configured
```

List all patches in the depot `/var/MyDepot` on the system grendel:

```
swlist -d -l product *,c=patch @ grendel:/var/MyDepot
```

List the filesets modified by installed patch PHSS_8675

```
swlist -a ancestor PHSS_8675
```

List all of the files delivered within patch PHCO_12140 after downloading from the ITRC:

```
swlist -d -l file @ /tmp/PHCO_12140.depot
```

List all patches that have modified the LVM product

```
swlist -l patch LVM
```

Display the documentation for all patches containing critical functionality

```
swlist -a readme -l product *,c=critical
```

List all category tags defined in the depot /var/MyDepot on the system grendel

```
swlist -d -l category @ grendel:/var/MyDepot
```

swreg Command

The `swreg` command registers or unregisters an existing depot. When a depot is registered, it can be accessed from remote systems. Unregistration of a depot can be a convenient way to limit access during development. (Note that unregistered depots are still available locally.)

Synopsis

swreg -l level [-u] [-v] [-C session_file] [-f object_file] [-S session_file] [-t target_file] [-x option=value] [-X option_file] [objects_to_(un)register] [@ target_selections]

Command Line Arguments	
`-l depot`	Perform operations on depots. While other levels of SD-UX objects may be modified by `swreg`, they are not within the scope of this tutorial.
`-u`	Causes `swreg` to unregister the specified objects instead of registering them.
`-v`	Requests verbose mode. This option affects only standard output and not the log files.
`objects`	Specifies the path to the object[s] to be registered or unregistered.

For the full set of available options, consult the `swreg(1m)` man page or the Software Distributor Administration Guide HP-UX 11i v1, 11i v2, and 11i v3.

Examples

Register the patch depot QPK1100:

```
swreg -l depot /cdrom/QPK1100
```

Disable remote access by unregistering the depot QPK1100 (local access is still enabled):

```
swreg -u -l depot /cdrom/QPK1100
```

swmodify Command

SD-UX commands automatically keep track of software management operations by creating an *Installed Products Database* (IPD) and various catalog files that contain information about the software on the system. Although you cannot edit the IPD or catalog files directly, the swmodify command lets you change the contents of these files via the command line.

WARNING: With the exception of committing patches and creating category tags, the swmodify command is not recommended for general usage. Improper alteration of the information in the IPD could cause unexpected behavior during

subsequent patching or system updates and leave your system in an unsupportable state.

NOTE: You may choose the cleanup utility as a front-end to the `patch_commit` option of `swmodify` that provides an easier interface to commit multiple patches at once.

Synopsis

swmodify [-d|-r] [-p] [-u] [-v] [-V] [-a attribute =[value]] [-c catalog] [-C session_file] [-f software_file] [-P pathname_file] [-s product_specification_file| [-S session_file] [-x option=value] [-X option_file] [software_selections] [@ target_selection]

Command Line Arguments	
`-a attribute[=value]`	Add, modify, or delete the value of the given attribute. If the `-u` option is specified, then delete the attribute from the given `software_selections` (or delete the value from the set of values currently defined for the attribute). Otherwise add/modify the attribute for each `software_selection` by setting it to the given value. Multiple `-a` options can be specified. Each attribute modification will be applied to every `software_selection`.
`-d`	Perform modifications on a depot. The given `target` must be a depot.
`-p`	Previews the modify operation without modifying anything. Preview mode is not enabled by default.
`-v`	Requests verbose mode. This option affects only standard output and not the log files.
`-x option=value`	Sets the specified command option to the value given, overriding any other values for that option. Patch related command options are specified below.
`s/w_selections`	One or more software specifications.
`target`	The depot to be modified. If not specified, the target is assumed to be the system itself.

The following options have the most relevancy to patching. Where appropriate, default values are shown. For the full set of available options, consult the `swmodify(1m)` man page or refer to the Software Distributor Administration Guide HP-UX 11i v1, 11i v2, and 11i v3.

Options
`option=default value` Description
`patch_commit=false` Commits a patch by removing files saved for patch rollback. The default value is false. When set to true, this option removes the saved files for the patches specified in the software selections for the command. Once you have run this option on a patch, you cannot remove the patch unless you remove the associated base software that the patch modified. See also the cleanup utility described below.

Examples

Add additional files to an existing fileset:

swmodify -xfiles='/tmp/a /tmp/b /tmp/c' PRODUCT.FILESET

Replace the definitions of existing files in an existing fileset (for example, to update current values for the
files' attributes):

chown root /tmp/a /tmp/b
swmodify -x files='/tmp/a /tmp/b' PRODUCT.FILESET

Delete control files from a fileset in an existing depot:

swmodify -d -u -x control_files='checkinstall subscript' \
PRODUCT.FILESET @ /var/spool/sw

Create a new fileset definition where the description is contained in the PSF file new_fileset_definition:

swmodify -s new_fileset_definition

Delete an obsolete fileset definition:

swmodify -u PRODUCT.FILESET

Commit a patch (remove files saved for patch rollback):

swmodify -x patch_commit=true PATCH

Create some new bundle definitions for products in an existing depot:

swmodify -d -s new_bundle_definitions * @ /mfg/master_depot

swpackage Command

While primarily used to create depots from source files, this command allows the transfer of software onto a tape or into a disk depot which can then be used as a software source. Either method can be used to transport the contents of a depot to another system for local access. The tape can be used in the absence of networking support, and the tape depot could be provided via ftp(1).

Synopsis

swpackage [-p] [-v] [-V] [-C session_file] [-d directory |device] [-f software_file]
[-s product_specification_file|directory] [-S session_file] [-x option=value] [-X option_file]

[software_selections] [@ directory |device]

Command Line Arguments	
`-p`	Previews the package operation without performing the actual packaging. Preview mode is not enabled by default.
`-v`	Requests verbose mode. This option affects only standard output and not the log files.
`-s directory`	An existing directory depot (which already contains products) to be used as the source.
`-x option=value`	Sets the specified command option to the value given, overriding any other values for that option. Patch related command options are specified below.
`s/w_selections`	One or more software specifications.
`Target`	If you are creating a distribution depot (directory), this operand defines the location of the *directory*. Without this operand, `/var/spool/sw` is used as the default depot directory. If you are creating a distribution tape, this operand names the *device* file on which to write the `tar` archive. The device file must exist so that swpackage can determine if the media is a DDS tape or a disk file. Without this operand, swpackage uses the device file `/dev/swtape`.

The following options have the most relevancy to patching. Where appropriate, default values are shown. For the full set of available options, consult the `swpackage(1m)` man page or refer to the Software Distributor Administration Guide HP-UX 11i v1, 11i v2, and 11i v3.

Options
`option=default value` Description
`compress_files=false` Setting this option to true causes `swpackage` to compress files before packaging them. This creates smaller depots.
`layout_version=1.0` Specifies the POSIX layout version to which the SD-UX commands conform when writing distributions. Supported values are 1.0 (default) and 0.8. Refer to the `swpackage(1m)` manpage or the Software Distributor Administration Guide HP-UX 11i v1, 11i v2, and 11i v3 for more information.
`target_type=directory` Defines the type of distribution to create. The recognized types are `directory` and `tape`.

Examples

Package the products defined in the PSF products into the default target depot:

swpackage -s products

Preview the same operation (do not create the target depot), and generate very verbose output:

swpackage -p -vv -s products

Package the products into the target depot no_files, insert references to the source files instead of copying
them into the depot:

swpackage -s products -x package_in_place=true @ no_files

Re-package a specific fileset:

swpackage -s products -x package_in_place=true product.fileset @ no_files

Re-package the entire contents of the depot /var/spool/sw onto the tape at /dev/rmt/0m:

swpackage -s /var/spool/sw -x media_type=tape @ /dev/rmt/0m

Create a depot on tape

- Which depots are on the server?

```
# swlist -l depot -s myserver

  /depots/11.11_AppDART56_Mar02
...
```

In this example, is Glance in a certain depot?

```
# swlist -l bundle -s myserver:/depots/11.11_AppDART56_Mar02 |\
grep -i glance
B3701AA_TRY    C.03.55.00    Trial HP GlancePlus/UX Pak for s800 11i
...
```

- Copy Glance to a local depot, as it is not possible to copy it directly to tape:

```
# swcopy -s myserver:/depots/11.11_AppDART56_Mar02 B3701AA_TRY @\
/tmp/glance_depot
```

- Add a patch to the depot:

```
# swcopy -s server2:/PATCHDEPOT/PHSS_24864 \* @ /tmp/glance_depot
```

- Check depot contents:

```
# swlist -d -l product @ /tmp/glance_depot
  Glance                C.03.55.00     HP GlancePlus/UX
  MeasureWare           C.03.55.00     MeasureWare Software/UX
  ...
```

```
  PHSS_24864              1.0             PRM C.01.08.2 Cumulative Patch
```

- Insert a DDS tape and copy the depot to the tape:

```
# swpackage -x target_type=tape -s /tmp/glance_depot \* @ /dev/rmt/0m
```

- or to a depot file:

```
# swpackage -x target_type=tape -s /tmp/glance_depot \* @ \
/tmp/glance_depot.depot
```

- Check depot contents:

```
# swlist -d -l product @ /dev/rmt/0m

  Glance                  C.03.55.00      HP GlancePlus/UX
  MeasureWare             C.03.55.00      MeasureWare Software/UX
  ...
  PHSS_24864              1.0             PRM C.01.08.2 Cumulative Patch
```

- Eject the tape:

```
# mt -t /dev/rmt/0m offl
```

swverify Command

The SD-UX `swverify` command verifies available (copied), installed, or configured software products on the specified host. swverify also:

- Determines whether installed or configured software is compatible with the host on which that software is installed.
- Makes sure that all dependencies (prerequisites, corequisites) are being met (for installed software) or can be met (for copied software).
- Executes vendor-specific verification scripts (that is, scripts that testify to the correctness of the product's configuration) if the installed state of the software is configured.
- Reports missing files, checks all file attributes including permissions, file types, size, checksum, mtime, link source and major/minor attributes.

Synopsis

swverify [-d|-r] [-F] [-v] [-C session_file] [-f software_file] [-J jobid] [-Q date] [-S session_file] [-t target_file] [-x option=value] [-X option_file] [software_selections] [@ target_selections]

The swverify command does not feature a GUI. All verify interaction with the system is done on the command line.

Command Line Arguments	
`-d`	Operate on a depot rather than installed software.
`-v`	Turn on verbose output to `stdout` and display all activity to the screen. Lets you see the results of the command as it executes.
`-f software file`	Read a list of software selections from a separate file instead of from the command line.
`-x option=value`	Specify a value to override a default value or a value in an options file.

Examples

To verify an installed fileset `mysoft.myfileset` located on the default depot at `myhosts`, you would type (You could also omit the @ sign and the myhost designation since the software being verified is assumed to be located in the default depot on the local host.):

```
swverify -d mysoft.myfileset @ myhosts
```

To verify the C and Pascal products that are installed on the local host:

```
swverify –v C Pascal
```

Verify the entire contents of a local depot:

```
swverify -d \* @ /var/spool/sw
```

NOTE: Look for errors in the `/var/adm/sw/swagent.log` file.

swconfig Command

The `swconfig` command lets you explicitly configure, unconfigure and reconfigure software products that are installed on a local host by executing the configure script. These scripts are only executed on the host that will actually be running the software.

You can use the swinstall and swremove commands to perform many configuration or unconfiguration tasks. However, the `swconfig` command lets you work independently of these commands. `swconfig` can also be useful when a configuration fails, is deferred, or must be changed. It runs only from the command line interface.

Synopsis

swconfig [-p] [-u] [-v] [-c catalog] [-C session_file] [-f software_file] [-J jobid] [-Q date] [-S session_file] [-t target_file] [-x option=value] [-X option_file]
[software_selections] [@ target_selections]

Selected Command Line Arguments	
`-p`	Preview a configuration task from the command line by running it through the Analysis Phase and then exiting.
`-v`	Turn on verbose output to stdout and display all activity to the screen. Lets you see the results of the command as it executes.
`-f software file`	Read a list of software selections from a separate file instead of from the command line.
`-x option=value`	Specify a value to override a default value or a value in an options file.

Examples

To configure `productA`, located in the default depot on the local host:

```
swconfig productA
```

Reconfigure the HP Omniback product:

swconfig -x reconfigure=true Omniback

Configure the version of HP Omniback that was installed at /opt/Omniback_v2.0:

swconfig Omniback,l=/opt/Omniback_v2.0

Unconfigure the software_selections listed in the file /tmp/install.products on the hosts listed in the file /tmp/install.hosts:

swconfig -u -f /tmp/install.products -t /tmp/install.hosts

Configure the C and Pascal products on remote hosts:

swconfig cc pascal @ hostA hostB hostC

Troubleshooting

Error Logging

All SD-UX commands (except `swlist` and `swacl`) log summary information about the session, and operation details to a command-specific logfile located (by default) in `/var/adm/sw/<command>.log`. For example, if you wanted to examine the logfile for

`swinstall`, you would look in the file `/var/adm/sw/swinstall.log`.

Of more interest in case of troubleshooting is to examine target agent logfiles for a current session. The location of the agent logfile varies, depending on the type of target:

- `/var/adm/sw/swagent.log` when operating on a host's primary root.
- `/<root_path>/var/adm/sw/swagent.log` for an alternate root.
- `/<depot_path>/swagent.log` for a target or source depot.

The default location of a host's daemon logfile is `/var/adm/sw/swagentd.log`. This logfile contains information for problems starting agents, particularly for problems where you have access denied to a depot or root.

Error Messages

SD-UX error messages indicate that a problem occurred that will influence the overall outcome of an operation.

For example, if a target in an install session fails the analysis phase due to insufficient disk space, you would find the following error message in the agent log file:

```
ERROR:  The estimated disk space used on filesystem "/" is
14104 Kbyte blocks. This operation will exceed the
minimum free space for this disk. You should free up at
least 2280 Kbyte blocks to avoid installing beyond this
threshold of available user disk space. If you are
running interactive "swinstall", you must return to the
Selection Window and Unmark this target before using
"swremove" to free disk space.
```

Warning Messages

Warning messages let you know that something unexpected and potentially undesirable occurred. A warning does not prevent the SD session from continuing. Warning messages during analysis of an interactive session give you the chance to continue or stop.

For example, if the fileset `SD-DATABASE.SD-DATABASE2` is being installed in multiple locations on a target system, you would find the following warning message in the agent log file:

```
WARNING: A version of fileset "SD-DATABASE.SD-DATABASE2,r=9.00.1C"
is already installed in another location (see previous
lines). Installing this version will create multiple
installed versions. This new multiple version will be
installed because the "allow_multiple_versions" option is
set to "true".
```

Notes

Notes are used to notify you of an event that is not erroneous, unexpected or undesirable, but that you should be aware of:

```
NOTE: The fileset "SD-DATABASE.SD-DATABASE1,r=9.00.1C" is
already installed. If you wish to reinstall this
fileset, change the "reinstall" option to "true".
```

swinstall/swremove Fails With a Lock Error or Hangs

Swinstall or swremove fails with the following message:

```
Cannot lock "/" because another command holds a conflicting lock. The
process id of that command is ####.
```

Another SD command is running that prevents the swinstall or swremove command from running. Wait for that command to finish and try again. It may be necessary to kill broken sessions and to restart the `swagentd` as described below (`swagentd -r`).

Sometimes it is necessary to configure some installed software, first:

```
swconfig \*
```

Cannot Contact Target Host's Daemon or Agent

If you see the following error message:

```
ERROR: Could not contact host <hostname>. Make sure the hostname is
correct.
```

It means that the hostname you specified could not be found in the hosts database. Make sure you have typed the hostname correctly and verify hostnames:

```
# hostname

# ping [hostname]

# nslookup [hostname]

# nslookup [IP adress]
```

If the target hostname is not in the hosts database, but you know its network address, you can use it (in standard "dot" notation) in place of the hostname.

If you see this error message:

```
ERROR:Remote Procedure Call to a daemon has failed.
Could not start a management session for <target>.
Make sure the host is accessible from the network,
and that its daemon, swagentd, is running. If the
daemon is running see the daemon logfile
on this target for more information.
```

It means SD-UX could not contact the daemon program on a specific target system. Note that this may occur even if you haven't specified any targets, for example, if the daemon on your local host is not running.

On the target system, type:

```
ps -e | grep swagentd
```

If the daemon does not appear to be running, you can start it by typing (as root on the target system):

```
/usr/sbin/swagentd
```

If you attempt to start a daemon when one is already running, you will see a message about the other daemon; this is harmless. You can also kill and restart a currently running daemon by typing:

```
/usr/sbin/swagentd -r
```

Slow Network Performance

When using `swinstall` or `swcopy` in an environment where network bandwidth is the "bottleneck," the file transfer rate between source and target can become very slow.

The `compress_files=true` (**Options→Change Options→Compress files during transfer**) option compresses files transferred from a source depot to a target. This can reduce network usage by approximately 50%; the exact amount of compression depends on the type of files. Binary files compress less than 50%, text files more.

Sometimes, the network affects the installation or copy of software even if it is done locally, e.g. from the local tape or CD. The `use_alternate_source=true` option (GUI: **Options→Change Options→All targets to resolve the source locally**) can help.

Debugging SD-UX Commands

Many times, if SD-UX is hanging in a particular function or for a variety of other reasons, SD-UX debug variables can be turned on to get more information generated to the

`/var/adm/sw/sw*.log` files.

Example:

```
# export SDU_DEBUG=1
# export SDU_DEBUG_TIMESTAMP=hour:minute:second:millisecond
# script -a /tmp/SDdebug.out
```

Perform SD-UX command.

```
# exit
# unset SDU_DEBUG
# unset SDU_DEBUG_TIMESTAMP
```

Analyze `/tmp/SDdebug.out`.

The variable `SDU_DEBUG` can have a value between 1 and 4:

Level 1: Trace entry to major function calls.
Level 2: Add trace of exit from major function calls.
Level 3: Add trace of some internals or variables in major function calls.
Level 4: Add tracing in functions that are called frequently.

Please remember that the `SDU_DEBUG` variables are neither officially supported nor documented, and their behavior may change without notice.

swinstall in Single User Mode

swinstall needs the Core networking functionality. So it won´t work in single user mode.

1st of all, try to bring up minimum networking functionality after booting into single user mode:

```
# init 1
# /sbin/init.d/net start
# /sbin/init.d/swagentd start
# /sbin/init.d/swconfig start
```

Now, try to swinstall. If it is still impossible, you may try the following unsupported procedure in single user mode:

`dlpi` and `lan0` drivers must be in the kernel. Then backup the following files:

```
# cp /etc/hosts /etc/hosts.org
# mv /etc/resolv.conf /etc/resolv.conf.org (move!)
```

It might be necessary to kill the `named` process in order to switch off DNS.

`vi` the `/etc/hosts` and replace the `localhost` entry by the actual *hostname*:

```
127.0.0.1       hostname        loopback
```

(Re-)start the `swagentd`:

```
# /usr/sbin/swagentd -r
```

Then use swinstall with the `use_alternate_source=true` option:

```
# swinstall -x use_alternate_source=true ...
```

Good luck! Don´t forget to reboot into single user mode and move the `hosts.orig` and `resolv.conf.orig` files back.

Rebuilding the Master INDEX file

Did you ever had one of the following SD-UX messages?

```
Incomplete definition for the product …
The expected depot or root does not exist at "/".
There is currently no installed software on host…
Ignoring duplicate definition …
Ignoring unknown keyword …
```

It may come from the removal or corruption of the master INDEX file.

The following unsupported procedure should work for HP-UX 10.20, 11.0 and 11i:

```
# mv /var/adm/sw/products/INDEX /tmp/INDEX.bak
# echo fileset > /var/adm/sw/products/INDEX
# swmodify -a title
```

Unbelievable, isn't it?

NOTE: If for some reason not only the master INDEX file got lost but the IPD got corrupted anywhere, it might be necessary to restore `/var/adm/sw/products` from backup.

Patch 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 superseeding 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.ix - 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 therefor 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 follwing **state** (as of UX 11.00):

applied	The patch is currently installed and can be rolled back using the `swremove` command.
committed	The patch is currently installed, but the patch's rollback files have

	been removed or were never created, since the flag `-x patch_save_files=false` 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 `-a superseded_by` command-line option of `swlist`. It will switch back to *applied* or *committed* if you `swremove` (roll back) all superseding patch(es).

For troubleshouting 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 superseeded 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 support portal HP IT Resource Center (ITRC) reached its end of life in June 2011. The HP Support Center portal now provides you with the capabilities you used and valued in ITRC, as well as new and enhanced features.

The following ITRC users should migrate to the HP Support Center:

* Those who had linked entitlements on ITRC.
* Those who have previously logged a case on the ITRC.

If you do not need to migrate, you may still take advantage of HP Support Center personalized features by signing in with HP Passport (steps 1 and 2 below).
Migration Steps

Follow the four steps below to migrate to HP Support Center:

Step 1 - Go to HP Support Center:

Step 2 - Sign in to HP Support Center with your HP Passport Username and Password.

(Note: This is different from your ITRC User ID and Password. If you do not yet have an HP Passport account, you can create one by clicking on "Register" underneath the sign-in prompt.)

If you have already established an HP Passport account, please ensure that your profile has a value in the "Company name" field. Click on "Edit your profile" after you have signed in with HP Passport to view or update your profile.

Step 3 - Click on the "ITRC Users" graphic.

Step 4 - Supply your ITRC username and password.

The Migration Tool will verify your account, move your information to HP Support Center and associate it to your HP Passport account.

If you had more than one account on ITRC, you can repeat the process above to associate all of these accounts to one single profile on HP Support Center.

You may access the following resources to assist with your migration:

* View the Migration Presentation.
* Get assistance on the HP Support Center.

* See the updated HP Support Center – Frequently Asked Questions document.
* Videos are also available on the HP Support Center Overview page.

```
We also recommend that you review the "Get Started with HP Support Center"
information available from the HP Support Center Home Page.

For more information regarding HP's privacy policy or to obtain contact
information please visit our privacy statement or write to us at:
Privacy Mailbox
ATTN: HP Privacy Mailbox
20555 SH 249,
Houston, Texas 77070

Hewlett-Packard website

Sign-up for Driver and Support Alerts
```

Downloading patches from the HP Support center

1) User signs in to the new HP support center.
2) Under the "Featured support services" tab select the " patch management" area to get patch information or download patches.

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 deliverd 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
```

Verifying Patch Installation

The result of the patch installation can be seen in the swagent log /`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 HWEnable11i
```

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 (HP Internal only)

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 at:
http://patch-hub.corp.hp.com/wtec/catalog/index.html 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 beeing 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 superseeded 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 on HP-UX o/s versions 11.0 and 11.11 but are available as a patch. At HP-UX o/s 11.23 and 11.31 the patch tools are part of the core o/s.

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 superseeded) patches do

```
# show_patches

    Active                              Patch
    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 can download Support Plus directly from the HP Patch Program website (HP internal), or install it from the quarterly media shipped to you if your HP-UX support contract is current. The HP Patch Program website (HP internal) additionally lists all the former Support Plus releases as of Sep.99.

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

NOTE: Both the GOLDBASE11i and GOLDAPPS11i bundles including their respective patches are delivered in the same depot and share the same README file.

Patch Content	Bundle READ ME File	Bundle READ ME File (HTML)	Refreshed in Release	Bundle Revision	Archive Depot
GOLDBASE11i			December 2009	B.11.11.0912.483	patchsvr.fc.hp.com:/depots/SP0912/GOLDQPK11i
GOLDAPPS11i			December 2009	B.11.11.0912.483	patchsvr.fc.hp.com:/depots/SP0912/GOLDQPK11i
HWEnable11i			December 2006	B.11.11.0612.458	patchsvr.fc.hp.com:/depots/SP0612/HWEnable11i
BUNDLE11i			June 2003	B.11.11.0306.1	patchsvr.fc.hp.com:/depots/SP61/BUNDLE11i

Document Title	Date	Links	Part Number
Support Plus User's Guide	December 2006	[PDF]	5991-7358
Support Plus Read Before Installing	December 2009	[PDF]	B3920-90000
HP-UX Patch Management User Guide	September 2007	[PDF]	5992-0674

UX 11.22 (Itanium release)

`MAINTPACK` Collection of defect-fix patches

UX 11.23 (Itanium release)

NOTE: Both the QPKBASE and QPKAPPS bundles including their respective patches are delivered in the same depot and share the same README file.

.

Patch Content	Bundle READ ME File	Bundle READ ME File (HTML)	Refreshed in Release	Bundle Revision	Archive Depot
QPKBASE			December 2010	B.11.23.1012.086a	patchsvr.fc.hp.com:/depots/SP1012/QPK1123
QPKAPPS			December 2010	B.11.23.1012.086a	patchsvr.fc.hp.com:/depots/SP1012/QPK1123
FEATURE11i			September 2010	B.11.23.1009.083	patchsvr.fc.hp.com:/depots/SP1012/FEATURE11i
HWEnable11i			December 2010	B.11.23.1012.085a	patchsvr.fc.hp.com:/depots/SP1012/HWEnable11i

Document Title	Date	Links	Part Number
Install and Update Guide	December 2007	[PDF]	5992-1978
Read Before Installing or Updating OE	June 2008	[PDF]	5992-4137
Read Before Installing Support Pack	December 2010	[PDF]	5900-1106
HP-UX Patch Management User Guide	September 2009	[PDF]	5992-6582
HP-UX Patch Management User Guide	September 2009	[PDF]	5992-6582

UX 11.31 (Itanium release)

NOTE: Both the QPKBASE and QPKAPPS bundles including their respective patches are delivered in the same depot and share the same README file.

Patch Content	Bundle READ ME File	Bundle READ ME File (HTML)	Refreshed in Release	Bundle Revision	Archive Depot
FEATURE11i			September 2011	B.11.31.1109.367a	patchsvr.fc.hp.com:/depots/SP1109/FEATURE11i
HWEnable11i			September 2011	B.11.31.1109.367a	patchsvr.fc.hp.com:/depots/SP1109/HWEnable11i
QPKAPPS			September 2011	B.11.31.1109.367a	patchsvr.fc.hp.com:/depots/SP1109/QPK1131
QPKBASE			September 2011	B.11.31.1109.367a	patchsvr.fc.hp.com:/depots/SP1109/QPK1131

Document Title	Date	Links	Part Number
Install and Update Guide	September 2011	[PDF]	BA927-90078
Read Before Installing	September 2011	[PDF]	BA927-90090
Release Notes	September 2011	[PDF]	BA927-90087
HP-UX Patch Management User Guide	September 2009	[PDF]	5992-6582

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

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`.

Patch Utilities on the Intranet

The Patch Hub Management and Services (HP Internal Only) site provides patch information, metrics, patch catalogs and patch tools. Several tools are available for researching, obtaining, installing, removing and managing patches on all HP-UX systems.

Patch Management and Availability:
The Patch Hub Team manages the patch release process for the BSC and HP Software organizations; this includes quality assurance and release control. The team also manages the Patch Hub server, which is the central distribution point of patches for internal and external customers.

Additional Information

Software Distributor Website:

Software Distributor Administration Guide HP-UX 11i v1, 11i v2, and 11i v3
http://bizsupport1.austin.hp.com/bc/docs/support/SupportManual/c02023876/c02023876.pdf

Valuable information can be found in the files under the `/usr/share/doc directory` on any UX 11ix system.

Related manual pages are:

swacl(1M), swagentd(1M), swask(1M), swconfig(1M), swjob(1M), swlist(1M), swmodify(1M), swpackage(1M), swreg(1M), swremove(1M), swverify(1M), update-ux(1M), sd(4), swpackage(4), sd(5).

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

The *HP-UX patch tools:*
http://patch-hub.corp.hp.com/wtec/tools/default.shtml

Patch white papers at this website:
http://patch-hub.corp.hp.com/wtec/wp/default.shtml

Sources:
Software Distributor Administration Guide HP-UX 11i v1, 11i v2, and 11i v3 (Sept 2011)
Patch Management User Guide for HP-UX 11.x Systems (Sept 2011)