THE CLEANUP COMMAND AT HP-UX 11.00

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The purpose of this paper is to inform you about what the *cleanup* command is and how it works on HP-UX 11.00. The *cleanup* command will "clean up" patch related areas. You can use this command for committing patches, correcting the patch_state attribute, removal of superseded patches from a depot and clean the Software Distributor IPD (Installed Products Database) after an upgrade from HP-UX 10.X. The features of the 11.00 *cleanup* command discussed in this paper were released in patch PHCO_19550.

PATCHING MECHANICS BEHIND THE SCENE

Prior to delving into the specifics of the *cleanup* command at 11.00, an overview of what happens behind the scenes may be helpful. There is a big difference in the way HP-UX 11.00 works with patches as compared to HP-UX 10.X.

The following two statements sum it up the best. They are subtle, yet very significant.

At 10.X, the real management of patches <u>is not</u> done directly by SD-UX. The control scripts do it: checkinstall, preinstall, postinstall, checkremove, preremove and postremove.

At 11.00, the real management of patches <u>is</u> done directly by SD-UX, not by the control scripts. Control scripts can still be used but they are only for extra, customized logic.

SD is now "patch aware". All patch information is kept in the IPD and it is tightly coupled. All software is described to SD by a data attributes. On HP-UX 11.00 there is a new attribute called "is_patch". If it is set to true, SD knows it's a patch. Therefore when a patch is introduced it is a known commodity and treated as such. Also, of major significance, all patch information is housed in the IPD, including superseding patch information. At 10.X the IPD had some patch information, but not all patch information. For instance, superseding patch information was kept in the file */var/adm/sw/patch/PATCH.log*. On HP-UX 11.00 the file */var/adm/sw/patch/ PATCH.log* no longer exists. The information still exists; it's in the IPD now. This means that just because you see a patch in the IPD, typically in the output from the *swlist* command, it does not mean that is active. Again, at 10.X, if a patch was in the IPD, it was the active patch. Okay, so how can you tell which patch is active on 11.00? Well, there is another new attribute, it is called "patch_state". The "patch_state" provides information about the current state of a patch. The value of “patch_state” can be applied, superseded or committed.

In the following example, watch how things change as newer versions of */sbin/mount* are installed. The newer versions of */sbin/mount*, in this example, are delivered in patches PHCO_14626 and PHCO_18473.

1. HP-UX 11.00 prior to any patches for */sbin/mount:*

```
# what /sbin/mount

/sbin/mount:
         $Revision: 82.5 $
```

2. After PHCO_14626 is installed, which is a patch for */sbin/mount*:

```
# what /sbin/mount

/sbin/mount:
         $Revision: 82.5.1.1 $
```

```
# swlist -l patch -a patch_state PHCO_14626

# Initializing...
# Contacting target "ccsy"...
#
# Target:  ccsy:/
#

# PHCO_14626
# PHCO_14626.UX-CORE            applied
```

```
# ll /var/adm/sw/save

…
drwxr-xr-x   3 root  sys     96 Apr  6 12:50 PHCO_14600
drwxr-xr-x   3 root  sys     96 Apr  6 12:50 PHCO_14625
drwxr-xr-x   3 root  sys     96 Aug 20 14:47 PHCO_14626  << just added
drwxr-xr-x   3 root  sys     96 Apr  6 12:50 PHCO_14627
…
```

After the patch installation */sbin/mount* has a new revision number and the */var/adm/sw/save/PHCO_14626* directory was created. There are more directories under */var/adm/sw/save/PHCO_14626*. If you drill down this directory you will ultimately find the original mount command, revision 82.5. Everything under */var/adm/sw/save/PHCO_14626* is there just in case you need to remove PHCO_14626 from the system. This is where *swremove* will find the previous revision of mount.

3. After PHCO_18473 is installed, which is also a patch for */sbin/mount* and supersedes PHCO_14626:

```
# what /sbin/mount

/sbin/mount:
         $Revision: 82.5.1.8


# swlist -l patch -a patch_state PHCO_18473 PHCO_14626
# Initializing...
# Contacting target "ccsy"...
#
# Target:  ccsy:/
#
# PHCO_14626
# PHCO_14626.UX-CORE            superseded
# PHCO_18473
# PHCO_18473.UX-CORE            applied
#
```

```
# ll /var/adm/sw/save

...
drwxr-xr-x   3 root  sys     96 Apr  6 12:50 PHCO_14600
drwxr-xr-x   3 root  sys     96 Apr  6 12:50 PHCO_14625
drwxr-xr-x   3 root  sys     96 Aug 20 14:47 PHCO_14626
drwxr-xr-x   3 root  sys     96 Apr  6 12:50 PHCO_14627
...
drwxr-xr-x   3 root  sys     96 Dec 30 11:29 PHCO_18473  << just added
...
```

After the patch installation */sbin/mount* has a new revision number and the */var/adm/sw/save/PHCO_18473* directory was created. There are more directories under */var/adm/sw/save/PHCO_18473*. If you drill down this directory you will ultimately find the previously installed version of the mount command, revision 82.5.1.1. Everything under */var/adm/sw/save/PHCO_18473* is there just in case you need to remove PHCO_18473 from the system. This is where *swremove* will find the previous revision of mount.

Also, both PHCO_18473 and PHCO_14626 are now in the IPD. However, when you look at their patch_state, you'll see that PHCO_18473 is in the applied patch_state and PHCO_14626 is in the superseded patch_state.

Again, notice how */sbin/mount* has a new revision number and see what other directories were created under the */var/adm/sw/save* directory. At this point, in this example, there are three versions of *mount* on the system :

```
/sbin/mount                                        Revision 82.5.1.8
/var/adm/sw/save/PHCO_18473/UX-CORE/sbin/mount     Revision 82.5.1.1
/var/adm/sw/save/PHCO_14626/UX-CORE/sbin/mount     Revision 82.5
```

OPTIONS OF THE CLEANUP COMMAND

-p Preview the cleanup task but do not actually perform
the requested action.

-n Notify the user of cleanup tasks and request
confirmation before performing the requested action.

-c <number>
Commit patches superseded at least <number> times.
This option is a front-end to the 'patch_commit'
option of swmodify(1M) that provides an easier
interface to commit multiple patches at once.

-d Remove patches in the specified software depot that
have been superseded by patches also available from
the depot.

-o <10|11>
Specifies if the software depot contains patches for
HP-UX 11.00 or 10.X releases. This option is only
valid with the -d option. If the -o option is not
specified, it defaults to HP-UX 11.00 patches.

-e <true|false>
Specifies if patches in the software depot that contain a corequisite or prerequisite attribute specifying one of the superseded patches as a dependency should also be removed. This option is only valid with the -d option. If the -e option is not specified, it defaults to true.

-i Remove HP-UX 10.X patches that remain in the Installed Product Database after an upgrade to HP-UX 11.00. These patches are removed from the IPD so that they are no longer displayed in the output of the swlist(1M) command. The HP-UX 10.X patch files are also removed from /var/adm/sw/patch.

-s Correct the patch_state attribute for HP-UX 11.00 patches.

COMMITTING PATCHES

Committing a patch means that of all the back out files for that patch will be removed from the system. This means you can no longer *swremove* that patch from the system. In other words, you are making a commitment that you will never want to *swremove* that patch from the system. When patches are *swinstalled*, SD puts the back out files in the */var/adm/sw/save* directory; committing a patch removes those back out files. Remember that *swremove* must put back all the files that were originally there before the patch was first installed. Therefore, once a patch is committed, *swremove* no longer has access to those files and cannot continue.

The *–c* option of the *cleanup* command is basically just a front-end interface to the *swmodify* command. The SD command for committing patches on HP-UX 11.00 is:

```
swmodify -x patch_commit=true PATCH
```

Therefore, the *cleanup –c* command is just passing information to the *swmodify* command to allow more than one patch at a time to be committed. As always, extreme care should be taken when committing patches. Once a patch has been committed, it cannot be removed, with *swremove,* from the system unless the appropriate files from the */var/adm/sw/save* directory are recovered from some source, like a backup.

To commit patches, i.e., remove the back out files for superseded patches, run the *cleanup* command with the *-c* option (see *Listing 3*). Now, getting back to the example of the mount command, we currently have the following on the system:

```
/sbin/mount                                         Revision 82.5.1.8
/var/adm/sw/save/PHCO_18473/UX-CORE/sbin/mount      Revision 82.5.1.1
/var/adm/sw/save/PHCO_14626/UX-CORE/sbin/mount      Revision 82.5
```

We will run the *cleanup* command using the number one (*cleanup –c 1*). This means we want to remove all of the back out files for patches that have been superseded at lease once. So in our example, PHCO_14626 qualifies to get committed (back out files removed) because it has been superseded once. As always, it is imperative to back things up prior to removing the back out files for patches from the system.

Listing 3: *cleanup –c 1*

```
# cleanup -c 1
### Cleanup program started at 01/10/00  16:37:24
Commit patches superseded at least 1 time(s) on 'ccsy'.
Obtaining superseded patch information...done.

The following patches superseded at least 1 time(s) can be committed:

Superseded  # Times Superseded  Disk Space in /var/adm/sw/save  Superseded By
==========  ==================  ==============================  =============
PHCO_13753           2                    64512 bytes             PHCO_18519
PHCO_14626           1                   208896 bytes             PHCO_18473
PHCO_14859           1                  1810432 bytes             PHCO_17477
PHCO_14887           1                  5056512 bytes             PHCO_16576
PHCO_15217           1                   424960 bytes             PHCO_17076
PHCO_18519           1                    82944 bytes             PHCO_19550
    .                .                       .                        .
    .                .                       .                        .
    .                .                       .                        .
PHSS_14597           1                 13995008 bytes             PHSS_17419
PHSS_15381           1                   779264 bytes             PHSS_16824

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 1 time(s) ...done.
    All information has been logged to /var/adm/cleanup.log.
    ### Cleanup program completed at 01/10/00  16:37:24
```

After running *cleanup –c 1,* in regards to the mount command, the system has the following:

Listing 4: ***versions of mount on the system now***

```
   /sbin/mount                                        Revision 82.5.1.8
   /var/adm/sw/save/PHCO_18473/UX-CORE/sbin/mount     Revision 82.5.1.1
```

As you can see in listing 4, the back out files for PHCO_14626 are no longer there. However, the IPD still has information regarding PHCO_14626. The *cleanup* command does not allow you to remove the most recent patch. Thus, you will always have the ability to *swremove* one level back. Furthermore, the last time “patch_state” was checked for PHCO_14626 it was superseded. That has changed because we committed it. Following shows the current “patch_state” of PHCO_14626:

```
        # swlist -l patch -a patch_state PHCO_14626
        # Initializing...
        # Contacting target "ccsy"...
        #
        # Target:  ccsy:/
        #
        # PHCO_14626
        # PHCO_14626.UX-CORE            committed
        #
```

Also, be aware that if you specify “1” as in *cleanup –c 1,* it really means at least “1”. Therefore, if a patch has been superseded more than once, it will also qualify. In the example (see Listing – 3), notice that PHCO_13753 has a “2” in the # Times Superseded column. It is superseded by PHCO_18519. Subsequently, PHCO_18519 is listed as being superseded once, by PHCO_19550. By running the *cleanup –c* with the number “1”, both PHCO_13753 and PHCO_18519 would be committed, i.e. back out files removed from the */var/adm/sw/save* directory.

CLEANING UP A DEPOT

To understand the purpose of the *-d* option, you must first understand the concept of depots and the potential problem that can occur after adding new patches to a depot.

A depot—actually in this case a directory depot—is just a collection of patches. It is where multiple patches exist together for the purpose of being available to be *swinstalled* on multiple boxes. You would have a depot for each different version of HP-UX that you support. The following steps show a normal progression of a depot:

1. Patches are added to the depot for the first time via the *swcopy* command..

2. The depot is used to *swinstall* patches on multiple boxes.

3. Time goes by and newer patches become available—some are new and others are supersedes.

4. Patches are added to the depot for the second time.

When patches are added to a depot for the second time, or any time thereafter, there is a chance that some of the new patches just added replace older patches that already exist in the depot.

Since it is possible to house both 10.X and 11.00 depots on an 11.00 box, the *–d* option applies to both. At 11.00 even if two patches exist for the same binaries, i.e. a patch and its successor in a depot, 11.00 SD (Software Distributor) will only attempt to install the latest patch. Again, SD is patch aware at 11.00. However, at 10.X, if a patch and its successor both exist in the same depot, both will go through the *swinstall* process. If applicable to the system (where they are being installed), they will both be installed. In most cases, the patch with the higher number will be installed last so the latest version of the binaries will be on the system. The downside of this is that the *swlist* command will show them as both being installed. Therefore it is more relevant to clean up 10.X depots to prevent this situation. The benefits of cleaning up an 11.00 depot is to save disk space and to make the depot less cluttered.

Therefore, you should always "clean up" your depot after adding more patches to it. To do this, you run the *cleanup* command with the *–d* option. And if you are cleaning up a 10.X depot, you will need to use the –o option and specify "10". Listing 5 shows an example of cleaning an 11.00 patch depot and listing 6 shows an example of cleaning a 10.20 depot. Also, when you use the *–d* option, it does not touch any other patch information outside of the depot that you are running it on. It does not touch the binaries that are currently installed or the IPD information, and it does not do anything with the files under */var/adm/sw/patch* or */var/adm/sw/save.*

Listing 5 : Cleaning a patch depot at 11.00

```
# cleanup -d /tmp/ccsy.depot
### Cleanup program started at 01/12/00  10:22:03
Cleanup of depot '/tmp/ccsy.depot'.
Obtaining the list of patches in the depot: /tmp/ccsy.depot ...done.
Obtaining the list of superseded 11.X patches in the depot:
     /tmp/ccsy.depot ...done.
The following superseded patches exist in the depot:
====================================================
PHCO_14626 superseded by PHCO_18473
. . .                            <<  all superseded patches will be listed

Please be patient; this may take several minutes.

Removing superseded 11.X patches from depot: /tmp/ccsy.depot ...done.
The superseded 11.X patches have been removed from the depot:
     /tmp/ccsy.depot.
All information has been logged to /var/adm/cleanup.log.
### Cleanup program completed at 01/12/00  10:22:03
```

Listing 6 : Cleaning a 10.20 patch depot on an 11.00 system

```
# cleanup -d /tmp/prod1020.depot -o 10
### Cleanup program started at 01/12/00  10:49:45
Cleanup of depot '/tmp/prod1020.depot'.
Obtaining the list of superseded 10.X patches in the depot:
     /tmp/prod1020.depot ...done.
The following superseded patches exist in the depot:
====================================================
PHCO_17699 superseded by PHCO_19694
. . .                               <<  all superseded patches will be listed

Please be patient; this may take several minutes.

Removing superseded 10.X patches from the depot ...done.
The superseded 10.X patches have been removed from the depot:
     /tmp/prod1020.depot.
All information has been logged to /var/adm/cleanup.log.
### Cleanup program completed at 01/12/00  10:49:45
```

CLEANING UP THE IPD

The IPD, Installed Products Database, is made up of many files under the */var/adm/sw/products* directory. At 11.00, SD (Software Distributor) is patch aware. Therefore, when a patch is installed, all patch information is recorded in the IPD. So when the *swlist* command is executed, it gets its information from the IPD. Now for the significance of the “*-i*” option. If you upgraded from 10.X—again, upgrade not install—to 11.00, and did not remove the old 10.X patch information, it will still reside in the IPD. An *swlist* would show all of the 10.X patch information. At that point the IPD is not in sync with what you have on the box. To correct this, run *cleanup -i* (see Listing 7). Also, this option will remove the 10.X patch information from the */var/adm/sw/patch* directory.

Listing 7: Cleaning up the IPD

```
# cleanup -i
### Cleanup program started at 01/11/00  09:52:52
Cleanup of IPD on 'ccsy'.
Obtaining list of 10.X patches from the Installed Product Database ...done.
There are no 10.X patches in the Installed Product Database.
Obtaining list of 10.X patch files in /var/adm/sw/patch ...done.
There is no 10.X patch information in /var/adm/sw/patch.
All information has been logged to /var/adm/cleanup.log.
### Cleanup program completed at 01/11/00  09:52:52
```

CORRECTING THE “PATCH_STATE” ATTRIBUTE

In SD on HP-UX 11.00, there is a new attribute called “patch_state”. Every patch in the IPD will have one of the following values for “patch_state”: applied, superseded, or committed. The command *cleanup –s* can verify and change the “patch_state” attributes if required. In listing 8 you will see where the *cleanup –s* command found a patch_state that was wrong. Besides reporting it, it also corrected it. In this particular case (see listing 8), the files for this patch were probably manually removed from */var/adm/sw/save*. In essence, that made the patch “committed” because the back out files were no longer there. Also *cleanup –s* was executed a second time showing that the “patch_state” was no longer wrong.

Listing 8: Checking the “patch_state” attribute

```
# cleanup -s
### Cleanup program started at 01/12/00  13:47:04
Cleanup of patch_states on 'ccsy'.
Obtaining patch_state information from the Installed Product Database
...done.
The following patch filesets have an incorrect patch_state attribute,
based on the 'superseded_by' attribute in the Installed Product
Database and the contents of the /var/adm/sw/save directory:
       Patch Fileset        Current patch_state Correct patch_state
=========================== =================== ===================
PHCO_15037.VXFS-BASE-RUN        applied            committed

Correcting committed patch_states in the IPD ...done.
All information has been logged to /var/adm/cleanup.log.
### Cleanup program completed at 01/12/00  13:47:04




# cleanup -s
### Cleanup program started at 01/12/00  13:47:50
Cleanup of patch_states on 'ccsy'.
Obtaining patch_state information from the Installed Product Database
...done.
All patches have the correct patch_state.
All information has been logged to /var/adm/cleanup.log.
### Cleanup program completed at 01/12/00  13:47:50
```

CLEANUP MAN PAGE *(11.0)*

```
cleanup - HP-UX patch cleanup utility

SYNOPSIS
      cleanup [-n|-p] -c <number>
      cleanup [-n|-p] -d <depot> [-o 10|11] [-e true|false]
      cleanup [-n|-p] -i
      cleanup [-n|-p] –s
DESCRIPTION
      The cleanup command provides functions useful when dealing with HP-UX
      patches on HP-UX 11.00.

      The cleanup command logs all information to /var/adm/cleanup.log.


Options
      cleanup recognizes the following options:

                -p    Preview the cleanup task but do not actually perform
                      the requested action.

                -n    Notify the user of cleanup tasks and request
                      confirmation before performing the requested action.

                -c <number>
                      Commit patches superseded at least <number> times.
                      This option is a front-end to the 'patch_commit'
                      option of swmodify(1M) that provides an easier
                      interface to commit multiple patches at once.

                -d    Remove patches in the specified software depot that
                      have been superseded by patches also available from
                      the depot.

                -o <10|11>
                      Specifies if the software depot contains patches for
                      HP-UX 11.00 or 10.X releases.  This option is only
                      valid with the -d option.  If the -o option is not
                      specified, it defaults to HP-UX 11.00 patches.

                -e <true|false>
                      Specifies if patches in the software depot that
                      contain a corequisite or prerequisite attribute
                      specifying one of the superseded patches as a
                      dependency should also be removed.  This option is
                      only valid with the -d option.  If the -e option is
                      not specified, it defaults to true.

                -i    Remove HP-UX 10.X patches that remain in the Installed
                      Product Database after an upgrade to HP-UX 11.00.
                      These patches are removed from the IPD so that they
```

are no longer displayed in the output of the swlist(1M) command. The HP-UX 10.X patch files are also removed from /var/adm/sw/patch.

-s Correct the patch_state attribute for HP-UX 11.00 patches.

RECOMMENDATIONS

The cleanup -i command should be executed after updating to HP-UX 11.00 from HP-UX 10.20. It is not necessary to execute cleanup -i after updating from one version of HP-UX 11.X software to another because SD-UX will properly remove 11.X patch information from the IPD in these situations.

The cleanup -d command should be executed whenever patches are added to a software depot. It is not a requirement that superseded 11.X patches be removed from a software depot, but it is a recommendation to conserve disk space and to avoid confusion. If superseded patches exist in the same depot as patches that supersede them, SD-UX on HP-UX 11.X will handle the situation properly.

The cleanup -c command can be executed to commit all patches that have been superseded specified number of times. The only benefit from committing patches is that disk space will be recovered in the /var/adm/sw/save directory.

The cleanup -s command can be executed to insure that the 'patch_state' attribute of all patch filesets is set correctly. There are several known situations where the 'patch_state' attribute will be set incorrectly. This command can be run at any time, but will be most useful after a system has been installed using Ignite-UX.

WARNING

Extreme care should be used when committing patches. Once a patch has been committed, it cannot be removed from the system unless the appropriate files from the /var/adm/sw/save directory are recovered from some source, like a backup. Patches should only be committed when you are satisfied with their behavior. Recovering disk space should not be the only factor considered when committing patches.