

UPDATE-UX: The new tool for updating to HP-UX 11.11

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Introduction

There are several valid methods for migrating an existing HP-UX workstation or server to the most current operating system level. They all involve performing some form of a **Cold Install** or an **Update**.

Cold Install means installing system software on a new (uninstalled) or existing system disk by completely rebuilding the root file system, erasing the existing operating system and data on that volume and installing the new operating system and specified software and data. An advantage of cold install is that supported software can be installed on the existing machine without regard for the software currently on the system, or concern for cleaning up old software.

Update means using the Software Distributor (SD-UX) tools to selectively overwrite the operating system and application software from a media or network source depot. In most cases, the user data and disk layout can be preserved when updating to a new operating system. An advantage of performing an update is that it leaves user data, configurations and applications in place. Updating to a new version of the operating system is dependent on the version of the operating system already on the system. The following update paths are supported for updating to HP-UX version 11.11:

- 10.20 → 11.11
- 10.20 + Extension Packs → 11.11
- 11.00 → 11.11
- 11.00 + Extension Packs → 11.11

The decision to cold install or update can be somewhat complex, but Cold Install is usually the best option if any of the following apply:

- You need to change aspects of the disk configuration that require reinstallation. (Examples include changing certain volume sizes, volume manager, or file system type.)
- The size of your current /stand partition is less than required by the operating system.

- It is necessary to have the same operating system loaded on many machines in a short period of time.
- It is important to have many systems loaded with the same operating system and applications and configured similarly.
- Your user, application and data files are on a separate volume from your operating system files or easily copied off the operating system volume and back on after its installation.

Update is often the best option if any of the following apply:

- Each of your systems is configured uniquely by design.
- You are only transitioning a few (1-3) systems to the new operating system.
- You have applications and data on your root volume that are difficult to save and restore.

This paper addresses the Update procedure to migrate your HP-UX operating system to version 11.11.

The procedures for updating to HP-UX versions 10.10, 10.20, 10.30 and 11.00, all involve the use of the *swgettools* utility. In HP-UX version 11.11, the *update-ux* utility replaces *swgettools* for the purpose of performing OS updates.

UPDATE-UX vs SWGETTOOLS, What's the Difference?

The update procedures involving *swgettools* included the following manual steps:

1. Make sure there's at least 2 MB free space in `/var/tmp`.
2. Copy the *swgettools* script and a *swagent.Z* file from either a local CD or a remote depot into the `/var/tmp` directory. The recommended procedure was to use `cp` or `rcp`. If copying from a remote depot, root access to the remote system was required, which wasn't always possible.
3. Use `chmod +x` to make the *swgettools* script executable.
4. Remove the SW-DIST.RUPDATE fileset from the target system:
`/usr/sbin/swremove SW-DIST.RUPDATE`
5. Execute *swgettools* to update SD-UX.
6. Execute *swinstall* with many command line arguments. The *swinstall* command actually performed the OS update.

Also, with every new release there was a section in the installation manual pertaining to additional concerns that users needed to be aware of before updating. These concerns included checking for minimum free disk space requirements, minimum free swap space and memory, and patches or software products that might need to be removed before an update.

When followed correctly, this update procedure was fairly robust. However, the number of steps involved sometimes led to mistakes, which could result in update problems.

Also, *swgettools* wasn't patchable, which means the delivery of any changes to *swgettools* had to be timed with HP-UX releases.

The *update-ux* utility improves the usability and robustness of the update process by eliminating many of the manual steps required by *swgettools* and automating some of the OS update preparation checks. In addition to creating a safe environment on the target system for the OS update, *update-ux* performs additional update preparation steps and actually initiates the update (the *swinstall* step above). This results in reducing the six or so manual steps listed above to one or two steps, depending on whether you're updating from HP-UX version 11.00 or 10.20 respectively.

During its execution, *update-ux* will automatically re-install itself from the source depot, including any patches to *update-ux*, and execute the newer version for the remainder of the update. This way you never have to explicitly install an *update-ux* patch.

Update-ux will also install the new version of the HP-UX Software Distributor (SD), plus any patches to it, from the source depot before initiating the OS update. *Swgettools* also installed the new SD, but didn't install any SD patches. Installing SD patches could be important because the new SD is then used to update the OS.

To prepare for updating from 10.20 to 11.11, *update-ux* performs the following:

- Tests to make sure Fibre Channel Mass Storage isn't on the target system.
- Tests to make sure you're not updating a cluster server.
- If the target system is using the Logical Volume Manager (LVM), then the partitions `/`, `/stand`, `/usr` and `/var` are checked for minimum free disk space requirements.

If any of these checks fails, *update-ux* will exit with a message indicating the issues that need to be resolved before attempting another update. After any issues are resolved, *update-ux* can be run again. If all the checks pass then the following tasks are performed by *update-ux*:

- If the product SW-DIST.RUPDATE is on system, remove it.
- Removes any 10x patch info on the system.
- Removes 10.20 bundle wrappers.
- Checks for JFS version 2 on `/var` or `/tmp` and upgrade to JFS version 3 if necessary.

To prepare for updating from 11.00 to 11.11, *update-ux* performs the following:

- If the target system is using the Logical Volume Manager (LVM), then the partitions `/`, `/stand`, `/usr` and `/var` are checked for minimum free disk space requirements.

If this check fails, *update-ux* will exit with a message indicating the issues that need to be resolved before attempting another update. After any issues are resolved,

update-ux can be run again. If all the checks pass then the following task is performed by *update-ux*:

- Removes 11.00 bundle wrappers.

None of these update preparation tasks were automated by the *swgettools* utility. Because these tasks are performed by *update-ux*, the OS update experience should be easier and more robust.

Pre-Update Considerations

System Backup

In addition to your normal periodic system backup procedures, it is strongly recommended that a backup tape or a network backup of your root volume group be made prior to performing an OS update. If this is done and a problem occurs during the update, it is a very simple procedure to restore the system to its original state. Two backup procedures are described in the following sections.

Backing up to a tape using *make_recovery*

The Ignite-UX utility *make_recovery* can be used to create a backup tape. This utility creates a bootable System Recovery tape for an LVM or whole disk file system while it is up and running. When a system has a logical volume layout, the recovery tape will only include data from the root volume group, plus data from any non-root volume group containing the `/usr` directory.

Ignite-UX may be obtained from the latest application CDs or from the World Wide Web at <http://www.software.hp.com>. Be sure to install any necessary patches as well. (All necessary patches are listed and described in the appropriate version's Release Notes.)

To create the bootable System Recovery tape, execute the following command:

```
make_recovery -vA
```

where `-v` is for verbose and the `-A` specifies the entire root disk or volume group.

If a tape drive other than the default (`/dev/rmt/0m`) will be used, use the `-d` option followed by the appropriate device name:

```
make_recovery -vA -d /dev/rmt/3mn
```

To recover a failed system disk or volume group after a recovery tape has been made, simply load the System Recovery tape, boot the system, interrupting the boot sequence to redirect to the tape drive. Allow the install process to complete. Do not intervene with ISL. The system will reboot and, because map files for all associated volume groups will

have been saved on the tape, any other existing volume groups will get imported and mounted automatically. Data which is not in the root volume group is expected to be backed up and recovered using normal backup utilities.

Backing up to a network using *make_net_recovery*

The Ignite-UX *make_net_recovery* tool creates a system recovery archive and stores the archive on the network. The archive created by *make_net_recovery* is specific to the system it was created for and its identity includes hostname, ip_address, networking information, etc. In the event of a root disk failure, the recovery archive can be installed via Ignite-UX to restore the system.

The contents of the system recovery archive will always include all files and directories which are considered essential to bringing up a functional system. This "essential" list is pre-defined by *make_net_recovery*. By running *make_net_recovery* in interactive mode, the directories and files which make up the "essential list" can be displayed. In addition to the essential list, data can be included in the archive on a disk/volume group, file, or directory basis. Non-essential files and directories can also be excluded.

For more information regarding *make_net_recovery*, including how to use it, see the *make_net_recovery (1m)* man page.

Disk space, swap space and memory requirements

To update your HP server or workstation to HP-UX 11.11, it must have the following:

- 64 MB memory, minimum
- 128 MB swap space, minimum
- 50 MB free space on LVM root partition
- 250 MB free space on LVM /usr partition
- 47 MB free space on LVM /stand partition
- 200 MB free space on LVM /var partition

The numbers for the free disk space requirements could change before the 11.11 release date. Be sure to review the HP-UX 11.11 installing and updating document for any changes to these numbers.

Update-ux will check the target system for the minimum requirements before performing the OS update. If any of these requirements are not met, *update-ux* will display an appropriate message and then exit. These minimum requirements must be met before an

OS update can proceed. Ignoring the documented disk space requirements has been one factor leading to problems in some update attempts using the *swgettools* process.

Creating an Update Depot

If you're updating from CD-ROM media, typically more than one CD will contain all the software required to perform an OS update. However, if you want to perform the update in one pass and avoid having to insert multiple CD's during an update, you will need to create a depot (either local or remote) that contains all the necessary software. The following procedure is recommended for creating an update depot on a system from a set of HP-UX 11.11 OS and Application CD's:

1. To create the update depot, you need at least 1230 MB of free space. If this space is not available, you can use SAM to either create a new volume group or extend an existing volume group.
2. Mount the logical volume on a new directory "/update". This directory will house your update depot.
3. "ioscan -fn | more" to find the CD-ROM device file name such as /dev/dsk/c1t2d0
4. "mkdir /SD_CDRROM" to create directory /SD_CDRROM under root "/"
5. Insert the HP-UX Core CD. Wait for busy light to stop blinking.
6. "mount /dev/dsk/c1t2d0 /SD_CDRROM" to mount the CD-ROM onto directory /SD_CDRROM as a file system.
7. "cp /SD_CDRROM/catalog/SW-DIST/pfiles/install-sd /var/tmp" to load *install-sd* from the CD into /var/tmp.
8. "/var/tmp/install-sd -s /SD_CDRROM" to install the 11.11 Software Distributor onto your system.
9. "swcopy -s /SD_CDRROM * @ /update/UpdateDepot" to merge all products (*) on the mounted CD-ROM to the target depot /update/UpdateDepot
10. "umount /SD_CDRROM" to unmount CD-ROM from directory /SD_CDRROM
11. Insert the next CD. Wait for busy light to stop blinking.
12. "mount /dev/dsk/c1t2d0 /SD_CDRROM" to mount the CD-ROM onto directory /SD_CDRROM as a file system.
13. Repeat step 9 through 12 until all CD-ROMs have been copied into /update/UpdateDepot .

The Update Depot, /update/UpdateDepot, is now ready to be used to update HP-UX 10.20 or 11.00 to HP-UX 11.11.

Updating to HP-UX version 11.11

What to do if *update-ux* is not yet installed on your system

If you're updating from HP-UX version 10.20 or 11.00, the *update-ux* utility will not be installed on your system. In this case, you must install *update-ux* before you attempt an OS update. To install *update-ux* onto the target system, execute the following command:

```
swinstall -s source_depot SW-DIST.SD-UPDATE > /dev/null 2>&1
```

where *source_depot* is the depot containing the 11.11 software. The redirections in this command are recommended if you're updating from 10.20, otherwise many inconsequential warning and error messages will be generated. This is because the 10.20 version of *swinstall* doesn't recognize many of the new keywords added to the 11.11 products in this depot. These errors and warnings can be ignored, so it is recommended that you add the redirections of standard out and standard error. If updating from 11.00, these errors and warnings will not be generated, so you don't need the redirections.

To verify that *update-ux* was successfully installed, execute the following command:

```
swverify SW-DIST.SD-UPDATE
```

If this command reports any errors, view the file `/var/adm/sw/swagent.log` to find out what the problem is.

After you have successfully installed *update-ux* onto the target system, proceed to the next section, which describes the use of *update-ux*.

What to do if *update-ux* is installed on your system

The following specifies *update-ux* usage:

```
update-ux [update-ux options] -s source-depot [swinstall-options Bundle Name]
```

Update-ux options:

- ? - print out this usage statement
- a bits - "architecture". Currently only used to specify 32 or 64 bits. "bits" can be only 32 or 64. When -a is not specified, the default value is based on the current "bitness" of the machine.

Source depot specification:

- s *source-depot* - source depot containing the new software. This argument is required.

Swinstall options:

- swinstall-options* - For a typical update using *update-ux*, no swinstall options are required and *swinstall* will run in command line mode. To start the *swinstall* GUI, add the "-i" option after the "-s source"

option. For more information about `swinstall` options, see the `swinstall` man page, available at <http://hp.com/go/sd>.

Bundle Name - The name of the bundle to be updated. This argument is recommended, but not required.

It is important for the '*update-ux options*' to appear before the '*-s source-depot*' specification. If any '*swinstall-options*' are used, it is important for them to appear after the '*-s source-depot*' specification.

The following is an example of the simplest use of *update-ux*:

```
update-ux -s /SD_CDRROM
```

When *update-ux* is executed in this form, software on the source depot will be selected for update by locating filesets on the source that match the target system's installed filesets.

In the above example, the 11.11 depot is on a local CD-ROM. If the source depot is on a remote machine, indicate the path to the depot as follows:

```
update-ux -s remote machine:/depot path
```

Updating to a 64-bit OS

The default behavior for *update-ux* is to update your system to an OS with the same word width (bits) that your system is currently using. For example, if the target system is currently operating in 32-bit mode, this will be the default for the new OS to be installed.

If you plan to update a system with the 64-bit version of the HP-UX operating system, you must ensure that your system can support it. Consider the following hardware and firmware issues:

- Is your hardware capable of running 64-bit operation?
- Is the firmware installed on that hardware recent enough to support 64-bit operation?

If you're updating from HP-UX version 11.00 or higher, *update-ux* can determine if your hardware and firmware are compatible with 64-bit operation. However, if you're updating from HP-UX version 10.20, you need to refer to the Software Transition Kit described below.

NOTE

Keep in mind that 64-bit binary data cannot be used by 32-bit applications. 64-bit is useful if you need large address space, such as for use with very large databases and large-scale modeling. 64-bit applications can be compiled and

linked on 32-bit systems; however, these applications cannot be run on a 32-bit system.

Before updating to a 64-bit operating system, HP strongly recommends that you use the Software Transition Kit (STK), which is found on the web at <http://www.software.hp.com/STK/>.

The STK contains a set of tools and documents to assess applications or libraries that run on 10.20 and 11.00 and help transition them to the 11.11 64-bit operation. The website also has release notes and a FAQ with details about supported systems and necessary firmware updates.

Once you've determined that you're going to update to a 64-bit OS, the following is an example of how to proceed using *update-ux*:

```
update-ux -a 64 -s source_depot
```

This will also work if you are updating from 11.11 32-bit to 11.11 64-bit.

Interactive software selection

To interactively select software for an OS update, add the “-i” option to the “swinstall arguments” on the *update-ux* command line. The following is an example of how to do this:

```
update-ux -s source_depot -i
```

This will cause *update-ux* to invoke the *swinstall* GUI, which will come up with software already selected to match what is currently on your system. The GUI will allow you to interactively change these software selections before performing the OS update.

Future Possibilities

Hewlett-Packard expects to continue making improvements to the OS update process. Possibilities include:

- Additional automation of manual steps
- Development of a GUI for *update-ux*. A GUI would provide an easy way to manage updates from multiple CD's, allowing the user to select what software is wanted and provide a way to interact with the update process.

Hewlett-Packard is interested in your suggestions and update experiences. If you have any suggestions or comments regarding HP-UX OS updates, please email them to: sbarga@fc.hp.com.

Conclusion

Update-ux improves the usability and robustness of the HP-UX OS update process. It achieves this primarily by automating many of the manual steps that were required previously. *Update-ux* is patchable and when executed, will automatically update itself from the source depot.

To ensure a successful OS update, there are several important pre-update considerations. These include system backup, checks for disk space, swap space and memory requirements, update depot setup, and considerations regarding 64-bit operation. Hewlett-Packard provides the tools and documentation that users need to successfully prepare for an OS update.

Hewlett-Packard continues to improve the HP-UX OS update process. Future possibilities for improvement include automating more of the OS update preparation steps and developing a GUI for *update-ux*.