



Using Live Upgrade 2.0 With JumpStart™ Technology and Web Start Flash

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Using Live Upgrade 2.0 With JumpStart™ Technology and Web Start Flash

This article is the third of a three-part series; this installment explains methods for using Live Upgrade (LU) 2.0 software with JumpStart™ technology and Web Start Flash. Please see the first article in this series “Managing Solaris™ Operating Environment Upgrades With Live Upgrade 2.0” for an introduction to the concepts and recommendations for using LU 2.0.

This article details the following:

- Using LU with JumpStart technology
- Using LU with Web Start Flash

This article assumes that you have a basic understanding of the JumpStart technology framework and the services it provides. It is also assumed that you have read the first article of this LU 2.0 series or are familiar with the LU 2.0 framework and its various uses.

Live Upgrade and JumpStart Technology

Live Upgrade (LU) 2.0 software provides the ability to upgrade systems using the configuration and installation profiles used when you install the Solaris Operating Environment (Solaris OE) with JumpStart technology. Additionally, LU 2.0 software enables you to install an LU alternate boot environment (ABE) from a Web Start Flash archive. This combination provides you with the advantages of using the JumpStart technology, such as helping ensure consistent Solaris OE installations, while getting the change-control and fall-back mechanism that LU provides.

Upgrading With LU 2.0 and JumpStart Technology

The following tasks outline the process you should follow when upgrading a system using LU with a JumpStart server.

1. Create and populate a new boot environment (BE) by cloning the current OE.
2. Use a JumpStart server to upgrade the new BE to the Solaris 8 OE 10/01.
3. Activate the new BE.

In this example, the Solaris 2.6 OE boot disk is `c8t1d0`; `c0t0d0` will be used as the boot device for the Solaris 8 OE 10/01 ABE. The `c0t0d0` disk was partitioned prior to executing the following LU commands. However, if changes to the partitioning are needed, you can implement them using the `format` or `fmthard` commands, or through the `Slice` submenu in the `lucreate` command character-based user interface (CUI) when `lucreate` is executed without `-m` options.

In this example, `rhone` is upgraded using a Solaris 8 OE 10/01 media directory, mounted via NFS, from the JumpStart server `travigne`.

Step 1: Creating and Populating a New Boot Environment

The `lucreate` command is used to name the existing Solaris 2.6 OE, and is also used to clone the existing BE. The `-c` option of `lucreate` names the current BE and is only required when you create the first ABE.

```
rhone# lucreate -c "Solaris2.6" -m /:/dev/dsk/c0t0d0s0:ufs \  
> -m -:/dev/dsk/c0t0d0s1:swap \  
> -n "Solaris8_10-2001"  
Please wait while your system configuration is determined.  
Determining what file systems should be in the new BE.  
  
Searching /dev for possible BE filesystem devices  
Please wait while the configuration files are updated.  
Please wait. Configuration validation in progress...  
  
*****  
Beginning process of creating Boot Environment <Solaris8_10-2001>.  
No more user interaction is required until this process is  
complete.  
*****  
  
Setting BE <Solaris8_10-2001> state to Not Complete.  
Creating file systems on BE <Solaris8_10-2001>.  
Creating <ufs> file system on </dev/dsk/c0t0d0s0>.  
</dev/rdisk/c0t0d0s0:      12584484 sectors in 4356 cylinders of 27  
tracks, 107 sectors  
      6144.8MB in 137 cyl groups (32 c/g, 45.14MB/g, 5632 i/g)  
super-block backups (for fsck -F ufs -o b=#) at:  
  32, 92592, 185152, 277712, 370272, 462832, 555392, 647952, 740512,  
( newfs/mkfs output deleted for brevity )  
10448560, 10541120, 10633680, 10726240, 10818800, 10911360,  
Mounting file systems for BE <Solaris8_10-2001>.  
Calculating required sizes of file systems for BE <Solaris8_10-  
2001>.  
Populating file systems on BE <Solaris8_10-2001>.  
Copying file system contents to BE <Solaris8_10-2001>.  
INFORMATION: Setting asynchronous flag on ABE <Solaris8_10-2001>  
mount point </.alt.3275/> file system type <ufs>.  
Copying of file system / directory </> is in progress...  
Copying of file system / directory </> completed successfully.  
Creating compare database for file system </>.  
Updating compare database on other BEs.  
Updating compare database on BE <Solaris8_10-2001>.  
Compare databases updated on all BEs.  
( continued on following page )
```

```
Making Boot Environment <Solaris8_10-2001> bootable.
Making the ABE bootable.
Updating ABE's /etc/vfstab file.
The update of the vfstab file on the ABE succeeded.
Updating ABE's /etc/mnttab file.
The update of the mnttab file on the ABE succeeded.
Updating ABE's /etc/dumpadm.conf file.
The update of the dumpadm.conf file on the ABE succeeded.
Updating partition ID tag on boot environment <Solaris8_10-2001>
device </dev/rdisk/c0t0d0s2> to be root slice.
Updating boot loader for <SUNW,Ultra-60> on boot environment
<Solaris8_10-2001> device </dev/dsk/c0t0d0s0> to match OS release.
Making the ABE <Solaris8_10-2001> bootable succeeded.
Setting BE <Solaris8_10-2001> state to Complete.
Creation of Boot Environment <Solaris8_10-2001> successful.
Creation of Boot Environment <Solaris8_10-2001> successful.
```

The `-m` options of the `lucreate` command are used to specify the location of the `/` file system and swap partition to be used by the new `Solaris8_10-2001` ABE. Since the `/export` partition was not specified, the same `/export` file system (and underlying disk partition) used for the `Solaris2.6` BE are used with the `Solaris8_10-2001` ABE.

Step 2: Upgrading the Alternate Boot Environment

After creating and populating the ABE by cloning the existing `Solaris2.6` OE BE, the ABE is upgraded from the JumpStart server `travigne`. The ABE is upgraded with the `luupgrade -u` command, with the `-s` option specifying that the `Solaris 8` OE installation media should be NFS mounted from the JumpStart server, and the `-j` option specifying that the JumpStart profile, `S8-server-upgrade.profile`, should be used from the JumpStart server.

Note – Use only the space character to separate the profile keyword and its value, do not use a tab character.

```
rhone# cat /net/travigne/jumpstart/Profiles/S8-server-
upgrade.profile
install_type upgrade
nospacecheck
nobootblock
backup_media none
rhone# luupgrade -u -n "Solaris8_10-2001" \
> -s /net/travigne/jumpstart/OS/Solaris_8_2001-10 \
> -j /net/travigne/jumpstart/Profiles/S8-server-upgrade.profile
Validating the contents of the media </net/travigne/jumpstart/OS/
Solaris_8_2001-10>.
The media is a standard Solaris media.
The media contains an operating system upgrade image.
The media contains <Solaris> version <8>.
The media contains patches for the product.
Locating upgrade profile template to use.
Locating the operating system upgrade program.
Checking for existence of previously scheduled Live Upgrade
requests.
Creating upgrade profile for BE <Solaris8_10-2001>.
Updating ABE's /etc/vfstab file.
The update of the vfstab file on the ABE succeeded.
Determining packages to install or upgrade for BE <Solaris8_10-
2001>.
Performing the operating system upgrade of the BE <Solaris8_10-
2001>.
CAUTION: Interrupting this process may leave the boot environment
unstable or unbootable.
The operating system upgrade completed.
Adding operating system patches to the BE <Solaris8_10-2001>.
The operating system patch installation completed.
INFORMATION: </var/sadm/system/logs/upgrade_log> contains a log of
the upgrade operation.
INFORMATION: </var/sadm/system/data/upgrade_cleanup> contains a
log of
cleanup operations required.
INFORMATION: Please review the above listed files on BE
<Solaris8_10-2001> to determine if any additional cleanup work is
required, or installers on additional volumes of the media being
upgraded to need to be run, before activating the BE.
The Live Upgrade of the BE <Solaris8_10-2001> is completed.
```

Step 3: Activating the New Solaris Operating Environment

After the `luupgrade` command completes, the new Solaris8_10-2001 ABE can be selected when necessary or convenient.

```
rhone# lustatus
BE_name           Complete  Active  ActiveOnReboot  CopyStatus
-----
Solaris2.6        yes      yes     yes             -
Solaris8_10-2001  yes      no      no              -
rhone# luactivate "Solaris8_10-2001"

*****

The target boot environment has been activated. It will be used
when you reboot. NOTE: You must use either init or shutdown when
you reboot. If you do not use one of these commands, the system
will not boot using the target BE.

*****

In case of a failure while booting to the target BE, the following
process needs to be followed to fallback to the currently working
boot environment:

1. Enter the PROM monitor (ok prompt).

2. Change the boot device back to the original boot environment by
typing:

    setenv boot-device rootdisk

3. Boot to the original boot environment by typing:

    boot

*****

Activation of boot environment <Solaris8_10-2001> successful.
```

The ABE is activated by rebooting at a convenient time as shown in the following example.

```
rhone# init 0
INIT: New run level: 0
The system is coming down. Please wait.
System services are now being stopped.
Print services stopped.
Stopping the syslog service.
Nov 28 16:51:22 rhone syslogd: going down on signal 15
Live Upgrade: Deactivating current boot environment <Solaris2.6>.
Live Upgrade: Executing Stop procedures for boot environment
<Solaris2.6>.
Live Upgrade: Current boot environment is <Solaris2.6>.
Live Upgrade: New boot environment will be <Solaris8_10-2001>.
Live Upgrade: Activating boot environment <Solaris8_10-2001>.
Live Upgrade: Updating partition ID tag on boot environment
<Solaris8_10-2001> device </dev/rdisk/c0t0d0s2> to be root slice.
fmthard: New volume table of contents now in place.
Live Upgrade: Updating boot loader for <SUNW,Ultra-60> on boot
environment <Solaris8_10-2001> device </dev/rdisk/c0t0d0s0> to
match OS release.
Live Upgrade: The boot device for boot environment <Solaris8_10-
2001> will be </dev/dsk/c0t0d0s0>.
Live Upgrade: Changing primary boot device to boot environment
<Solaris8_10-2001>.
Live Upgrade: The current boot environment <Solaris2.6> boots from
device <rootdisk disk1:a>.
Live Upgrade: The new boot environment <Solaris8_10-2001> boots
from device <disk:a rootdisk>.
Live Upgrade: Activation of boot environment <Solaris8_10-2001>
completed.
The system is down.
syncing file systems... done
Program terminated
{2} ok boot
Resetting ...

screen not found.
Can't open input device.
Keyboard not present. Using ttya for input and output.

Sun Ultra 60 UPA/PCI (2 X UltraSPARC-II 450MHz), No Keyboard
OpenBoot 3.27, 2048 MB memory installed, Serial #13109146.
Ethernet address 8:0:20:c8:7:9a, Host ID: 80c8079a.
[remainder of command output removed for sake of brevity ]
```

Live Upgrade and Web Start Flash

Live Upgrade (LU) 2.0 software enables you to use a Web Start Flash archive to install an ABE. The following sections provide a high-level overview of the Web Start Flash technology and detail the Web Start Flash installation procedures.

Brief Overview of Web Start Flash

Web Start Flash provides a mechanism for archiving a specific (or reference) installation of the Solaris OE. You can then use that archive to install the Solaris OE. The reference installation is created from the on-disk Solaris OE, which includes all installed software. This system is designated as the master machine. The reference installation can be a Solaris OE installed by any means, for example, with JumpStart software, from CD, or by an interactive installation.

After the master machine is identified, the reference installation is captured in a Web Start Flash archive. A central feature of Web Start Flash, this archive is essentially a point-in-time snapshot of the Solaris OE, software patches, and applications on the master machine.

The Web Start Flash extensions enable you to install the archive from an NFS server or from an HTTP server, in addition to installing from a traditional JumpStart server. Additionally, you can access the archive from a disk device (including CD-ROM) or from a tape device local to the installation client. The Web Start Flash archive is transmitted over the network to the installation client and written to the disk. After the archive is written to the installation client's disk, any necessary archive modifications are performed. For example, configuration files, such as `/etc/nsswitch.conf`, on the installation client may need to vary from the file on the master machine. The Web Start Flash mechanism enables you to automate modifications and allows for differences in kernel architecture or device differences between the master machine and the installation client.

Additionally, Web Start Flash enables automatic resolution of partitioning differences between the master machine and the installation client. For example, if the Web Start Flash archive was created on a system with a single root (`/`) partition and the installation client has separate `/` and `/var` partitions, the archive automatically customizes to the installation client. Remember, the installation client partitioning must be correctly specified in the JumpStart software profile.

The Web Start Flash archive is a snapshot of a system and, as such, includes all specified files on that system. If Web Start Flash creates an archive from a system while it is in use, some files need to be cleaned up or zeroed out after the archive is installed. Examples of these types of files include log files, such as those found in

`/var/adm` and any files in the `/var/tmp` directory. Log files can be easily zeroed out from a finish script after installation. In the case of temporary directories, such as the `/var/tmp` directory, it is recommended that they you exclude them when the Flash archive is created.

A Web Start Flash archive should be created after you install all software, but before you put the system into production. Further, depending on the software installed and the intended use for the system, you may need to create the archive after the software is installed, but before you configure the software. For example, you should create an archive for a database server or LDAP server after the database management software has been installed, but before the databases have been created and populated.

Installing the Solaris OE with a Web Start Flash archive can be dramatically faster than it is with other mechanisms, depending on factors such as network traffic and disk speeds.

For more information about using Web Start Flash, refer to the *Solaris 8 Advanced Installation Guide* and the Sun BluePrints book, *JumpStart™ Technology: Effective Use in the Solaris™ Operating Environment* by John S. Howard and Alex Noordergraaf (ISBN 0-13-062154-4).

Installation Using LU 2.0 With Web Start Flash

When using Web Start Flash with LU 2.0, the specified ABE is not upgraded; instead the contents of the Web Start Flash archive are extracted and installed to the specified ABE. The following tasks outline the installation process using LU with Web Start Flash.

1. Create and populate a new BE by cloning the current OE.
2. Upgrade the new BE to the Solaris 8 OE 10/01 using a Web Start Flash archive.
3. Activate the new BE.

In this example, the Solaris 2.6 OE boot disk is `c8t1d0s0`; `c0t0d0s0` will be used as the boot device for the Solaris 8 OE 10/01 ABE. The `c0t0d0` disk was partitioned prior to executing the following LU commands. However, if changes to the partitioning are needed, you can implement them using the `format` or `fmthard` commands or through the `slice` submenu in the `lucreate` command character-based user interface (CUI) when `lucreate` is executed without `-m` options.

The Web Start Flash archive used throughout these examples was created as follows:

```
bordeaux# flarcreate -n "Solaris 8 10/01 server image" \  
> -a "j.s.howard@Sun.COM" \  
> -R / \  
> -x /var/tmp/f \  
> /var/tmp/f/Solaris_8_2001-10.archive  
Determining which filesystems will be included in the archive...  
Determining the size of the archive...  
The archive will be approximately 779.60MB.  
Creating the archive...  
1596522 blocks  
Archive creation complete.
```

After completion, the Web Start Flash archive was transferred via ftp to the /jumpstart/FlashArchives directory of the JumpStart server travigne.

Step 1: Creating and Populating a New Boot Environment

As in the previous example, the `lucreate` command is used to name the existing Solaris 2.6 OE and is also used to clone the existing BE. The `-c` option of `lucreate` names the current BE and is only required when the first BE is created.

```
rhone# lucreate -c "Solaris2.6" -m /:/dev/dsk/c0t0d0s0:ufs \  
> -m -:/dev/dsk/c0t0d0s1:swap \  
> -n "Solaris8_10-2001"  
Please wait while your system configuration is determined.  
Determining what file systems should be in the new BE.  
  
Searching /dev for possible BE filesystem devices  
Please wait while the configuration files are updated.  
Please wait. Configuration validation in progress...  
  
*****  
Beginning process of creating Boot Environment <Solaris8_10-2001>.  
No more user interaction is required until this process is  
complete.  
*****  
  
Setting BE <Solaris8_10-2001> state to Not Complete.  
Creating file systems on BE <Solaris8_10-2001>.  
Creating <ufs> file system on </dev/dsk/c0t0d0s0>.  
</dev/rdisk/c0t0d0s0>:      12584484 sectors in 4356 cylinders of 27  
tracks, 107 sectors  
      6144.8MB in 137 cyl groups (32 c/g, 45.14MB/g, 5632 i/g)  
super-block backups (for fsck -F ufs -o b=#) at:  
  32, 92592, 185152, 277712, 370272, 462832, 555392, 647952, 740512,  
( newfs/mkfs output deleted for brevity )  
10448560, 10541120, 10633680, 10726240, 10818800, 10911360,  
Mounting file systems for BE <Solaris8_10-2001>.  
Calculating required sizes of file systems for BE <Solaris8_10-  
2001>.  
Populating file systems on BE <Solaris8_10-2001>.  
Copying file system contents to BE <Solaris8_10-2001>.  
INFORMATION: Setting asynchronous flag on ABE <Solaris8_10-2001>  
mount point </.alt.3275/> file system type <ufs>.  
Copying of file system / directory </> is in progress...  
Copying of file system / directory </> completed successfully.  
Creating compare database for file system </>.  
Updating compare database on other BEs.  
Updating compare database on BE <Solaris8_10-2001>.  
Compare databases updated on all BEs.  
( continued on following page )
```

```
Making Boot Environment <Solaris8_10-2001> bootable.
Making the ABE bootable.
Updating ABE's /etc/vfstab file.
The update of the vfstab file on the ABE succeeded.
Updating ABE's /etc/mnttab file.
The update of the mnttab file on the ABE succeeded.
Updating ABE's /etc/dumpadm.conf file.
The update of the dumpadm.conf file on the ABE succeeded.
Updating partition ID tag on boot environment <Solaris8_10-2001>
device </dev/rdisk/c0t0d0s2> to be root slice.
Updating boot loader for <SUNW,Ultra-60> on boot environment
<Solaris8_10-2001> device </dev/dsk/c0t0d0s0> to match OS release.
Making the ABE <Solaris8_10-2001> bootable succeeded.
Setting BE <Solaris8_10-2001> state to Complete.
Creation of Boot Environment <Solaris8_10-2001> successful.
Creation of Boot Environment <Solaris8_10-2001> successful.
```

The `-m` options of the `lucreate` command are used to specify the location of the `/` file system and swap partition to be used by the new `Solaris8_10-2001` ABE. Since the `/export` partition was not specified, the same `/export` file system (and underlying disk partition) used for the `Solaris2.6` BE will be used with the `Solaris8_10-2001` ABE.

Step 2: Installing the Alternate Boot Environment

To install a Web Start Flash archive into an LU BE, the `luupgrade` command is used with the `-f` option. When doing an installation using Web Start Flash, the `-s` option of the `luupgrade` command must be used to specify the location of the `miniroot` to be used during the installation process.

When installing a Web Start Flash archive with LU, you must specify the location of the archive. This information must be specified using one of the following methods:

- A fully-qualified path to the archive (the `-a` option to `luupgrade -f`)
- A command line archive specification (the `-J` option to `luupgrade -f`)
- A JumpStart profile (the `-j` option to `luupgrade -f`)

The following three examples are all equivalent commands for installing a Web Start Flash archive into the Solaris8_10-2001 ABE. Each command is an example of installing a Web Start Flash archive using one of the preceding specification methods. You should choose the command form that is most appropriate to your needs, or environment; however, only one of these commands should be executed.

```
rhone# luupgrade -f -n "Solaris8_10-2001" \  
> -s /net/travigne/jumpstart/OS/Solaris_8_2001-10 \  
> -a /net/travigne/jumpstart/FlashArchives/  
Solaris_8_2001-10.archive  
Validating the contents of the media </net/travigne/jumpstart/OS/  
Solaris_8_2001-10>.  
The media is a standard Solaris media.  
Validating the contents of the miniroot </net/travigne/jumpstart/OS/  
Solaris_8_2001-10/Solaris_8/Tools/Boot>.  
Constructing flash profile template to use.  
Locating the flash install program.  
Checking for existence of previously scheduled Live Upgrade requests.  
Creating flash profile for BE <Solaris8_10-2001>.  
Performing the operating system flash install of the BE <Solaris8_10-  
2001>.  
CAUTION: Interrupting this process may leave the boot environment  
unstable or unbootable.  
The operating system flash install completed.  
The Live Flash Install of the BE <Solaris8_10-2001> completed.
```

```
rhone# luupgrade -f -n "Solaris8_10-2001" \  
> -s /net/travigne/jumpstart/OS/Solaris_8_2001-10 \  
> -J "archive_location nfs 10.1.1.8:/jumpstart/FlashArchives/  
Solaris_8_2001-10.archive"  
Validating the contents of the media </net/travigne/jumpstart/OS/  
Solaris_8_2001-10>.  
The media is a standard Solaris media.  
Validating the contents of the miniroot </net/travigne/jumpstart/OS/  
Solaris_8_2001-10/Solaris_8/Tools/Boot>.  
Constructing flash profile template to use.  
Locating the flash install program.  
Checking for existence of previously scheduled Live Upgrade requests.  
Creating flash profile for BE <Solaris8_10-2001>.  
Performing the operating system flash install of the BE <Solaris8_10-  
2001>.  
CAUTION: Interrupting this process may leave the boot environment  
unstable or unbootable.  
The operating system flash install completed.  
The Live Flash Install of the BE <Solaris8_10-2001> completed.
```

```
rhone# cat /net/travigne/jumpstart/Profiles/S8_2001-10-server-  
Flash.profile  
archive_location nfs 10.1.1.8:/jumpstart/FlashArchives/  
Solaris_8_2001-10.archive  
rhone# luupgrade -f -n "Solaris8_10-2001" \  
> -s /net/travigne/jumpstart/OS/Solaris_8_2001-10 \  
> -j /net/travigne/jumpstart/Profiles/S8_2001-10-server-  
Flash.profile  
Validating the contents of the media </net/travigne/jumpstart/OS/  
Solaris_8_2001-10>.  
The media is a standard Solaris media.  
Validating the contents of the miniroot </net/travigne/jumpstart/  
OS/Solaris_8_2001-10/Solaris_8/Tools/Boot>.  
Constructing flash profile template to use.  
Locating the flash install program.  
Checking for existence of previously scheduled Live Upgrade  
requests.  
Creating flash profile for BE <Solaris8_10-2001>.  
Performing the operating system flash install of the BE  
<Solaris8_10-2001>.  
CAUTION: Interrupting this process may leave the boot environment  
unstable or unbootable.  
The operating system flash install completed.  
The Live Flash Install of the BE <Solaris8_10-2001> completed.
```

Step 3: Activating the New Solaris Operating Environment

After the `luupgrade` command completes, the new Solaris8_10-2001 ABE can be selected when necessary or convenient.

```
rhone# lustatus
BE_name           Complete  Active  ActiveOnReboot  CopyStatus
-----
Solaris2.6        yes      yes     yes             -
Solaris8_10-2001  yes      no      no              -
rhone# luactivate "Solaris8_10-2001"

*****

The target boot environment has been activated. It will be used
when you reboot. NOTE: You must use either init or shutdown when
you reboot. If you do not use one of these commands, the system
will not boot using the target BE.

*****

In case of a failure while booting to the target BE, the following
process needs to be followed to fallback to the currently working
boot environment:

1. Enter the PROM monitor (ok prompt).

2. Change the boot device back to the original boot environment by
typing:

    setenv boot-device rootdisk

3. Boot to the original boot environment by typing:

    boot

*****

Activation of boot environment <Solaris8_10-2001> successful.
```

The ABE is activated by rebooting at a convenient time as shown in the following example.

```
rhone# init 0
INIT: New run level: 0
The system is coming down. Please wait.
System services are now being stopped.
Print services stopped.
Stopping the syslog service.
Nov 28 16:51:22 rhone syslogd: going down on signal 15
Live Upgrade: Deactivating current boot environment <Solaris2.6>.
Live Upgrade: Executing Stop procedures for boot environment
<Solaris2.6>.
Live Upgrade: Current boot environment is <Solaris2.6>.
Live Upgrade: New boot environment will be <Solaris8_10-2001>.
Live Upgrade: Activating boot environment <Solaris8_10-2001>.
Live Upgrade: Updating partition ID tag on boot environment
<Solaris8_10-2001> device </dev/rdisk/c0t0d0s2> to be root slice.
fmthard: New volume table of contents now in place.
Live Upgrade: Updating boot loader for <SUNW,Ultra-60> on boot
environment <Solaris8_10-2001> device </dev/rdisk/c0t0d0s0> to
match OS release.
Live Upgrade: The boot device for boot environment <Solaris8_10-
2001> will be </dev/dsk/c0t0d0s0>.
Live Upgrade: Changing primary boot device to boot environment
<Solaris8_10-2001>.
Live Upgrade: The current boot environment <Solaris2.6> boots from
device <rootdisk disk1:a>.
Live Upgrade: The new boot environment <Solaris8_10-2001> boots
from device <disk:a rootdisk>.
Live Upgrade: Activation of boot environment <Solaris8_10-2001>
completed.
The system is down.
syncing file systems... done
Program terminated
{2} ok boot
Resetting ...

screen not found.
Can't open input device.
Keyboard not present. Using ttya for input and output.

Sun Ultra 60 UPA/PCI (2 X UltraSPARC-II 450MHz), No Keyboard
OpenBoot 3.27, 2048 MB memory installed, Serial #13109146.
Ethernet address 8:0:20:c8:7:9a, Host ID: 80c8079a.
[remainder of command output removed for sake of brevity ]
```

Begin and Finish Scripts

With the current releases of Web Start Flash and Live Upgrade (LU), the `luupgrade` command only provides a mechanism to utilize a JumpStart profile. There is no mechanism to specify a JumpStart begin or finish script for execution before or after the `luupgrade`.

To circumvent this deficiency, use a shell script that contains the LU commands along with any begin or finish scripts. For example, to automatically execute the `EE_Lab-Flash.fin` script after a LU Flash installation, the following script could be used:

```
#!/bin/sh
#
# If /a does not exist, lumount will create it
#
lumount Solaris8_10-2001 /a
SI_CONFIG_DIR=/net/travigne/jumpstart
export SI_CONFIG_DIR
# Place execution of Begin script here:
# sh ${SI_CONFIG_DIR}/Begin/MyBeginScript.beg
lumount Solaris8_10-2001
#
# Perform the upgrade/Flash install
#
luupgrade -f -n "Solaris8_10-2001" \
-s /net/travigne/jumpstart/OS/Solaris_8_2001-10 \
-j /net/travigne/jumpstart/Profiles/S8_2001-10-server-Flash.profile
#
#
lumount Solaris8_10-2001 /a
#
# Place execution of Finish script here:
#
SI_CONFIG_DIR=/net/travigne/jumpstart
export SI_CONFIG_DIR
sh ${SI_CONFIG_DIR}/Finish/EE_Lab-Flash.fin
lumount Solaris8_10-2001
```

Note – This script is for example purposes only. For clarity, this script does not perform error checking.

Note that since the finish script is not executed within the JumpStart technology framework, this script sets the `SI_CONFIG_DIR` variable for use by the finish script. If other `SI_` environment variables were used by the begin or finish script, you would also need to manually set them in the framework script. Also, the ABE file systems are mounted on `/a` since most finish scripts expect the newly installed file system to be mounted under `/a`.

You can use this mechanism to execute finish scripts that configure a logical volume manager, such as Solaris Volume Manager (also known as Solstice™ DiskSuite) or VERITAS Volume Manager, and to automatically bring the boot disk under volume-manager control and mirror it.

Summary

This article details the recommended procedure for using LU 2.0 JumpStart technology and Web Start Flash. Additionally a framework for the execution of JumpStart begin and finish scripts was presented.

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